UNIVERSITY FOR DEVELOPMENT STUDIES, TAMALE

PSYCHOSOCIAL BURDEN ON SUFFERERS OF DIABETES MELLITUS IN THE TAMALE METROPOLIS

BY

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(UDS/CHD/0090/12)

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APRIL, 2015
DECLARATION

Student

I hereby declare that this dissertation is the result of my own original work and that no part of it has been presented for another degree in this University or elsewhere:

Candidate’s Signature: ................................................................ Date: ........................................

Name: Emma Brown Woode

Supervisors

I hereby declare that the preparation and presentation of the dissertation was supervised in accordance with the guidelines on supervision of dissertation laid down by the University for Development Studies.

Supervisors’ Signature: ........................................ Date: ........................................

Name: Dr. Gideon Kofi Helegbe
ABSTRACT

Introduction: Diabetes as a cause of disease burden has increased over time. While many work has been done on the psychosocial burden it poses, little is done about it in Ghana and the African region as a whole. The objective of this study was to determine the psychosocial burden of diabetes on its sufferers in the Tamale metropolis.

Methods: This cross sectional study was carried out in May 2014 on 293 participants at the 3 main government hospitals in the Tamale metropolis that provides routine diabetic clinics. Questionnaires were used to collect data on the financial, social, medical, emotional and psychological burden they face that affect their quality of life. Psychological burden was assessed using Patient Health Questionnaire 9 (PHQ 9). A binary logistics regression was used to analyse for strength of associations between the dependent (depressive symptoms) and independent variables (socio economic status) obtained whiles a multinomial logistic regression was used to derive significant predictors for psychosocial burden.

Results: From the analysis 37.9% had out-of-pocket expenses every month for needed medication, 12.6% had moderately severe depression, 65% had comorbid chronic conditions and 17.7% had complications resulting from diabetes. Individuals in informal employment were 17 times more likely to be burdened by depressive symptoms compared with those in the formal sector (aOR=17.0; 95% CI: 1.7-177.6; P=0.017). Respondents who did not know how they got the disease were less likely to default in their clinic attendance (OR=0.4; 95%CI=-0.2-0.7; P=0.005) compared to those that had an idea of how they got the disease, whiles at the same time respondents who did not know how they got the disease were 8 times more likely to be burdened by depressive symptoms compared with those who could tell how they got the condition (aOR=8.0; 95%CI: 1.9-32.8; P=0.004). Respondents without family history of the disease were 4.5 times more likely to express depressive symptoms compared to those without it (aOR=4.5; 95% CI: 1.0-20.1; P= 0.049). While 73.4% of respondents believed the disease was God given, 93.5% of respondents believed in religious coping. Patients' had a variety of social, spiritual and environmental perceptions of how they had the disease which influenced their coping strategies.

Conclusion: Analysis showed respondents in the informal sector, poor social support and no personal glucometers were significant predictors of the psychosocial burden of diabetes mellitus in the metropolis. Informed education and collaboration between patients and healthcare professionals will help improve psychosocial outcomes.
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DEDICATION

This work is dedicated to my husband Bill Zebre Bakomora, my parents and the entire family for their prayers and warm support.
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CHAPTER ONE
1.0 INTRODUCTION

1.1 Background of study

Diabetes mellitus, long considered a disease of minor significance to world health, is now taking its place as one of the main threats to human health in the 21st century. The past two decades have seen an explosive increase in the number of people diagnosed with diabetes worldwide. Pronounced changes in the human environment, and in human behaviour and lifestyle, have accompanied globalization, and these have resulted in escalating rates of both obesity and diabetes (Zimmet et al., 2001).

Ghana is one country that joins the International Diabetes Federation (IDF) made up of 170 countries and territories to celebrate World Diabetes Day yearly on 14 November as a way of educating and increasing awareness of the public on diabetes. In developing countries, particularly in Sub-Saharan Africa, it has been suggested that the prevalence of diabetes and hypertension is increasing rapidly generally because of increasing longevity and the continuous effect of contributing factors such as an unhealthy diet, obesity and physical inactivity of which Ghana is no exception (Addo et al., 2006).

One of the major threats to economic development confronting the 46 Member States of the WHO African Region is the growing burden of diabetes and other non-communicable diseases. The effectiveness of prevention and control of those diseases hinges largely on the health system performance of its functions of leadership and governance; health workforce; medical products, vaccines and technologies, information, financing and services delivery (Kirigia et al., 2009).

Diabetes alone is a disease requiring high levels of independent self-care with regards to diet, activity and medication. The impact of diabetes and related complications on costs can be
classified into two categories (International Diabetes Federation (IDF) 2009). The first is diabetes itself, with 12 people per minute globally diagnosed with diabetes and 6 per minute dying of its complications. The treatment of diabetes itself is costly; on the other hand, as much as 80% of Type 2 diabetes is avoidable through lifestyle changes and obesity prevention. Although costly and time consuming to treat, the real impact of diabetes is through its complications, the second impact of diabetes (Kanavos et al., 2012).

Diabetes is a risk factor for many diseases; it is an area of public health concern because the condition has the potential to affect a large segment of the population. In 2000, the prevalence of diabetes in the WHO African Region was estimated at 7.02 million people, out of which about 0.702 million (10%) people had type 1 diabetes and 6.318 million (90%) had type 2 diabetes. About 113,100 people died from diabetes-related causes, 561,600 were permanently disabled, and 6,458,400 experienced temporary disablement (Kirigia et al., 2009).

Measuring morbidity and mortality are key considerations for estimating the burden of disease in populations. However, only focusing on morbidity and mortality effects provides an incomplete picture of the adverse impact of ill health on human welfare (WHO, 2009).

The prevalence of non-communicable diseases (NCDs) such as diabetes mellitus, asthma, hypertension and other cardiovascular diseases is rising in Ghana as a result of increasing life expectancy, abuse of alcohol, tobacco use, poor dietary habits, inadequate physical activity and increasing stress. Currently, it is estimated that NCDs constitute over 20% of all cases of outpatient attendance. The government’s new policy on regenerative health and nutrition is expected to provide the basis for prevention and management of NCDs. This programme focuses on healthy eating, improving food safety, regular exercise, drinking potable water,
rest, improving environmental sanitation, improving personal hygiene and ensuring lifestyles that promote health (WHO country cooperation strategy 2008-2011).

Diabetes as a condition increases an individual’s risk for many serious health problems. It is a major cause of heart disease and stroke; and death rates for heart disease and the risk of stroke are about 2–4 times higher among adults with diabetes than among those without diabetes. It is a premature cause of mortality with 5-10 years of shortened life expectancy (Kanavos et al., 2012). Diabetes can also lead to other complications such as kidney failure and amputations of legs or feet (CDC, 2012).

Quantifying the prevalence of diabetes and the number of people affected with diabetes, now and in the future, is important to allow rational planning and allocation of resources. The prevalence of diabetes for all age groups worldwide was estimated to be 2.8% in 2000 and estimated to be 4.4% in 2030. The total number of people is projected to rise from 171 million in 2000 to 366 million in 2030 and the urban population of developing countries is projected to double from 2000 and 2030 (Wild et al., 2004).

Diabetes in all its forms imposes unacceptably high human, social and economic costs on countries at all income levels. International Diabetes Federation (IDF) Diabetes Atlas most recent estimates indicate that 382 million people (8.3% of adults) have diabetes and the number is expected to rise. Yet, with 175 million of cases currently undiagnosed, a vast amount of people with diabetes are progressing towards complications unawares (IDF, 2013). Moreover, over 70% of the total number affected living in low- and middle-income countries, where the epidemic is gathering momentum at alarming rates, the IDF Diabetes Atlas’ latest figures provide a worrying indication of the future impact of diabetes as a major threat to global development (IDF, 2013). It is estimated that 4 million Ghanaians may be affected with diabetes mellitus (GNA, 2012).
Globally, diabetes is responsible for 5% of all deaths annually (WHO, 2011). Given current projections, without urgent action, mortality due to diabetes is expected to increase by 50% in the next 10 years (Kanavos et al., 2012). Diabetes prevalence studies in southern Ghana have recorded a steady increase. The earliest studies in the 1960s recorded 0.2% prevalence in a population of men in Ho (Aikins, 2007). Diabetes screening conducted by the Ghana Diabetes Association in the early 1990s suggested 2–3% prevalence in urban areas in southern Ghana (Aikins, 2007); in the late 1990s a prevalence rate of 6.4% for diabetes and 10.7% for impaired glucose tolerance (IGT) was recorded in a community in Accra (Amoah et al., 2002). At Korle-Bu hospital, the percentage of medical admissions due to diabetes increased almost two-fold from 3.5% in the mid-1970s to 6.4% in the mid-1980s (Aikins, 2007).

With the ever increasing number of people with the condition, its impact will not only be felt by the individual, family or household but the entire nation. Diabetes and its complications affect people's lives and those of family members in many ways. It places a high burden on society. This burden is related to health system costs incurred by society in managing the disease such as: indirect costs resulting from productivity losses due to patient disability and premature mortality, time spent by family members accompanying patients when seeking care, and (intangible costs) psychological pain to the family and loved ones (Kirigia et al., 2009). Making lifestyle changes (managing hyperglycaemia, hypertension, and dyslipidaemia as well as other complications and co-morbidities); taking steps to help prevent and treat complications; losing time from school and work; and paying for supplies and drugs can place a burden on individuals with diabetes and their families. These stresses can affect the quality of life and overall health of an individual (PHAC, 2011). Consequently productivity will decrease, more competent personnel, equipment as well as medical supplies will be
needed and efforts at lifting people from the present poverty level to middle income will be thwarted (Kanavos et al., 2012).

Diabetes care, in particular, is greatly influenced by psychosocial factors when they hinder a person's ability to manage the disease and achieve metabolic control (Kent et al., 2010). There is increasing recognition that the socio-cultural and socio-economic contexts are important mediating factors for chronic non-communicable disease risks and experiences (Aikins, 2013). Psychological, emotional and social factors not only impact quality of life, but also often play a role in chronic illness outcomes.

1.2 Problem Statement

Diabetes mellitus places a high socio-economic burden on sufferers. This burden is widespread and is seen in most developing countries including Ghana. The psychosocial burden as presented by various researchers such as Aikins et al., (2013) is high in the southern regions of Ghana due to psychological and emotional insecurities, poverty and limited social support. In the northern parts of the country, poverty is high and is supported by the Ghana Statistical Service (2013) reports that poverty is quite endemic in the three northern regions to the extent that it would be a difficult hurdle to reduce extreme poverty by a range between 11.7 percentage points in the Northern Region and 41.8 percentage points in the Upper West Region to reach the target of halving extreme poverty by 2015. Poverty appears to be a risk factor for both communicable and non-communicable disease. Since the 1970s studies in poor communities in Accra have demonstrated stronger co-existence of communicable and non-communicable diseases compared to wealthier communities (Aikins, 2007). These communities are also likely to suffer complications of, and die prematurely from, chronic diseases because they lack access to quality healthcare (Aikins, 2007). Therefore in the northern parts of Ghana where poverty levels are high, access to quality
health care being poor, long distances to health facilities and inadequate social welfare services, the psychosocial burden of diabetes mellitus may be higher compared to the southern regions of Ghana. This study therefore seeks to determine the psychosocial burden of the diabetes mellitus in the Tamale Metropolis and the coping mechanisms sufferers adopt in the face of this debilitating challenge.

1.3 Research Questions

1.3.1 General research question: what are the psychosocial burdens faced by people living with diabetes in the Tamale metropolis?

1.3.2 Specific research questions

- Do socio economic factors contribute to the psychosocial burden influencing the quality of life of diabetics?
- Do the effects of psychosocial factors influence the accessibility of medical care by diabetics?
- What are the mechanisms employed by diabetic patients to help cope with the disease?

1.4 Objectives of the Study

The main objective of the study is to determine the psycho social burden faced by people living with diabetes in the Tamale Metropolis.

1.4.1 Specific Objectives

- To assess socio economic factors contributing to the psycho social burden of diabetics
- To determine the effects of socio economic factors on the accessibility of medical care by diabetics
- To assess coping mechanisms adopted by diabetics
1.5 Hypothesis
The study objectives will be guided by the following hypothesis:

H₀: Psychosocial burden of diabetes does not impact negatively on it sufferers

H₁: Psychosocial burden of diabetes impact negatively on it sufferers

1.6 Justification
Diabetes has become a serious burden on the health care delivery system, since it is one of the leading causes of pre-mature deaths and disabilities and also account for 62% of all stroke cases. With the growing evidence of the double burden of disease- increasing number of communicable diseases coupled with an equally increasing number of non-communicable disease (NCD) in the country, the burden of diabetes make significant demands on an already scarce health resources that cannot be sustained. Knowledge of the true burden is necessary to inform policy formulation and direction to develop effective, comprehensive and country-tailored remedies to tackle this pandemic. This may also help increase awareness of the impacts of the condition by communicating the adverse effects that people go through. There is therefore a need to better understand the realities of living with diabetes in order to tailor adequate and appropriate medical and psychosocial interventions.

1.7 Conceptual framework
People living with diabetes experience psychosocial challenges. The psychosocial impact of chronic disease straddles the psychological-social continuum of everyday experience of chronic illness (Aikins et al., 2013). This continuum encompasses at one end the psychological and emotional response to the physical and life changing impact of long term illness and at the other end the structural impact of living with a long-term condition such as healthcare access and costs. In between, individuals deal with the social and cultural implications of illness, such as the way socio-cultural representations of the illness and
responses to the individual with the illness strengthen or undermine social support (Aikins et al., 2013).

A growing body of work in Ghana and other African countries suggest that chronic illness beliefs are rooted in complex socio-cultural knowledge systems (Aikins et al., 2010). In a social psychological study of social representations of diabetes in rural and urban Ghana, researches identifies five sources from which rural and urban individuals draw knowledge on general health, pluralistic health systems, illness, chronic disease and diabetes: social (e.g. family and friends), cultural (traditional handed-down knowledge), cross-cultural (through regional and international travel), institutions (pluralistic health professionals, mass media) and self (unique experiences of self in health and disease), (Aikins et al., 2010).
1.8 Organization of study

The study is divided into six main chapters. The introduction, problem statement and objectives, justification of the study, the research purpose, hypothesis and organization of study is dealt with in Chapter one. Chapter two provides an overview of existing literature on theoretical foundation and empirical studies on diabetes. Chapter three covers methodology which gives the profile of the districts, the theoretical framework and the empirical model that underpin the analysis of the data. Chapter four deals with the presentation and analysis of the data collected from the field whiles chapter five looks purely at the discussion of findings.
backed by literature. Chapter six looks at the summary of findings, recommendation and policy implications of the research.
CHAPTER TWO
2.0 LITERATURE REVIEW

2.1 Overview

This chapter reviews literature on diabetes and its psychosocial burden on individuals, families and governments as well as empirical review on diabetes studies. The review specifically covers definition of diabetes, the socio economic and cultural burden of diabetes and coping strategies adopted by diabetics.

2.2 Diabetes defined

Diabetes is a group of metabolic diseases in which a person has high blood glucose level either because the individual’s body cannot produce adequate insulin or cannot make use of the insulin produced by the pancreas which is often called Type 2 diabetes; or the body cells does not produce insulin and these patients are dependent on insulin injection referred to as Type 1 diabetes or juvenile diabetes because it occurs in early childhood or teenage years (Nordqvist, 2010). Diabetes mellitus is classified into four types: type 1 diabetes, type 2 diabetes, gestational diabetes, and other specific types that are associated with genetic defects and infections (ADA, 2008).

Uniform diagnostic criteria for diabetes were first recommended by the American Diabetes Association and the World Health Organization (WHO) in 1979 and 1980 and were updated in the late 1990s. According to the American Diabetes Association criteria, diabetes is defined as:

1. (glycated haemoglobin) Hb A1C ≥ 6.5%

2. Fasting Plasma Glucose (FPG) ≥ 126 mg/dl (7.0 mmol/l), where fasting is defined as no caloric intake for at least 8 hours
3. Oral Glucose Tolerance Test (OGTT) or Random blood glucose (RPG/RBS) ≥ 200 mg/dl (11.1 mmol/l) where random means any time of day with no regard of last meal and OGTT means using a glucose load containing the equivalent of 75g anhydrous glucose dissolved in water (ADA, 2008).

While Type 1 is found in children or adulthood or before age 30-40 years, it is the least common occurring 5-10% of all diabetic cases worldwide. Type 2 on the other hand accounts for 90% of the cases and is often associated with diet, physical inactivity, and obesity among others. Therefore Type 1 diabetes occurs when there is extremely low or no insulin production from the pancreatic beta cells which makes the patients dependent on insulin for survival whiles in Type 2 diabetes there is insulin resistance or insulin deficiency (Goldstein, 2007). The potential causes of type 2 diabetes include an aging population, lifestyle changes, limited physical activity, obesity, and high caloric intake. Type 2 diabetes is a costly healthcare burden and in terms of medical expenditure and lost productivity, the cost of type 2 diabetes was estimated to be about $132 billion in 2002 (Goldstein, 2007).

Type 1 diabetes mellitus diverges from Type 2 in that it is not preventable, diagnosis in children is often missed, and in many cases it requires a different approach to care (Kratzer, 2013). Diabetics with either form face many of the same obstacles to obtaining adequate care such as under-resourced primary health care facilities, financial burden, lack of formal support, access to information; and for children with diabetes, schooling presents an array of issues (Kratzer, 2013). Another type of diabetes, gestational diabetes occurs in females during pregnancy because the hormones produced during pregnancy increase the amount of insulin needed to control blood glucose level. However, their bodies are unable to produce enough insulin to transport all the glucose into cells resulting in high blood glucose level. Gestational diabetes is restricted to women in whom glucose intolerance develops or discovered only during pregnancy (Nordqvist, 2010).
2.2.1 The burden of diabetes and its complications

The exact costs of diabetes are not easy to pin down but estimations can be obtained according to three levels (Boutayeb et al., 2004):

1. Cost directly related to the diagnosis and management of diabetes without complications. This includes the in-patient and out-patient care, means of treatment by insulin or tablets and the equipment of self-control (blood and urine testing).

2. Costs generated by complications of diabetes. These are difficult to quantify because diabetes is linked to micro and macro vascular diseases such as heart disease, kidney failure, eye disease and amputation. Moreover, diabetes may add a cost of care by complicating other unrelated medical situations like infections, accidents and surgery.

3. Indirect costs correlated to the quality of life and the economic productivity which can be somehow estimated by the degree of disability.

2.3 Financial burden of diabetes

Diabetes is an expensive disease, especially when the cost of complications, including the many diseases where diabetes is an underlying causal factor, is considered (Hall et al., 2011). It is believed that complications from diabetes accounts for most of the social and financial burden.

While socio-economic inequalities in chronic diseases and their risk factors have been studied extensively in high-income countries, very few studies have investigated social inequalities in chronic disease risk factors in low or middle-income countries. Documenting chronic disease risk factors is important for understanding disease burdens in poorer countries and for targeting specific populations for the most effective interventions (Leone et al., 2012).
Few studies were identified which investigated the cost of diabetes in the region. Kiriga et al., (2009) estimated that the total economic cost (direct and indirect) of diabetes in the WHO's Africa region in 2000 was US$67.03 billion, or US$8,836 per person with diabetes per year. Kiriga et al., (2009) also estimated that the direct cost of treating diabetes in 2000 ranged from US$2,302 to US$3,207 per person. One study into the cost of caring for children with T1DM in Sudan found that the mean annual expenditure on diabetes care was US$283 per diabetic child, 36% of which was spent on insulin (Elrayah et al., 2005). Another study reported by Hall et al. (2011) estimated that in 1989-1990 the total cost of outpatient care for all diabetic patients was US$2.7 million, of which insulin accounted for two-thirds of the expenditure, and total in-patient cost was US$1.25 million. As diabetes care in Tanzania was provided free of charge to users this total cost of US$4 million was paid from the government health budget and accounted for 8% of the government's total health expenditure 1989-1990. A South African study also investigated the cost of hyperglycaemic emergency admissions in South Africa over a two month period in 2005 and reported an average cost of R5309, equivalent to US$712, per admission (Pepper et al., 2008).

Treating chronic disease in Ghana is expensive for both low- and high-income people. Without health insurance, managing a condition such as diabetes can cost more than the average individual earns (Aikins, 2007). The economic impact of chronic diseases for individuals has a knock-on impact on their family livelihood and relations, as well as their long-term treatment choices (Aikins, 2007). Low-income individuals struggle to cover medical costs as well as costs for everyday management of diabetes such as prescribed healthy diets. The high cost of care has a major influence on the healthcare choices individuals made (Aikins et al., 2013). A rural-urban study of diabetes experiences showed that many poor rural men and women with diabetes often relied on financial support from their immediate and distant family members (Aikins, 2007). This dependence on family
members who themselves were financially insecure caused family tensions and frictions, which in some cases led to family abandonment and social isolation. Healer-shopping within ethnomedical and faith healing systems was often a by-product of the high cost of biomedical treatment (Aikins, 2007).

In 2007, the cost of controlling one case of diabetes per month in Ghana was GH100 (US$106) – GH600 (US$638) compared to US $180 – $420 in 2001 (Aikins, 2007). It also showed that in 2007, the cost of

- controlling one case of diabetes per year in 2007: GH1200 ($1276) - GH7200 ($7600)
- minimum daily wage in 2007: GH1.9 ($2)

As of now, the National health insurance scheme (NHIS) revised tariffs which took effect from 1st August 2014 paid tertiary hospitals GH221.91 for simple diabetes and GH380.95 for complicated diabetes for adults (≥12 years); and pays GH190.01 for simple diabetes and GH354.79 for complicated diabetes for children (<12 years) and are allowed 6 visits in a 12 months period (NHIS, tariffs for tertiary hospitals 2014). This only takes into accounts the direct financial burden of diabetes (NHIS tariffs for Teaching Hospitals in Ghana, 2014).

The economic cost had two components; the cost of organizing and operating hospital services which included diagnostic tests, medicines, non-pharmaceutical supplies etc. and the out-of-pocket expenses borne by the patients and their families, including health service provider consultation fees, medicines, tests and transport (Kiriga et al., 2009).

In assessing the economic burden of people with Type 2 diabetes, studies reported that 40% of the people were on 1 medication, 26% on 2 medications and 8% were on 3 or more medications with a significantly higher number of prescriptions and higher out of pocket expenses with an average added costs per year based on 4 prescriptions was $925.00 (Polin, 2010). When illness strikes it affect the financial well-being of most people since many
individuals do not anticipate and prepare for it. This means that many individuals will tap into accumulated assets intended for different purposes (Cook et al., 2010) since money is needed to assess health care services.

In a study carried out by the American Diabetes Association to estimates the economic cost of diabetes in the U.S in 2012, the total estimated cost of diagnosed diabetes in 2012 was $245 billion including $176 billion in direct medical costs and $69 billion in reduced productivity; representing 41% increase over a five year period. The largest components of medical expenditures are hospital inpatient care (43% of the total medical cost), prescription medications to treat the complications of diabetes (18%), anti-diabetic agents and diabetes supplies (12%), physician office visits (9%), and nursing/residential facility stays (8%), (ADA, 2013). People with diagnosed diabetes incur average medical expenditures of about $13,700 per year, of which about $7,900 is attributed to diabetes and on average, have medical expenditures approximately 2.3 times higher than what expenditures would be in the absence of diabetes. The indirect costs associated with diabetes include workdays missed due to health conditions (absenteeism), reduced work productivity while working due to health conditions (presenteeism), reduced workforce participation due to disability, and productivity lost due to premature mortality. Productivity loss occurs among those in the labour force as well as among the unemployed population (ADA, 2013). Average medical expenses are more than twice as high for a person with diabetes as they are for a person without diabetes. In 2007, the estimated cost of diabetes in the United States was $174 billion. That amount included $116 billion in direct medical care costs and $58 billion in indirect costs (from disability, productivity loss, and premature death), (CDC, 2012).

The disease burden related to diabetes has been reported to be distributed unevenly across the population with higher rates of premature morbidity and mortality among diabetics than in the general population irrespective of the country, study period or age-group studied.
2.4 Social burden associated with diabetes

The physical, financial and emotional burden of diabetes across cultures and countries is carried by the entire family, not just the person with diabetes and involvement of family members is a vital part of good diabetes care (Nordisk, 2012). The day to day management of diabetes is demanding and can take a heavy psychological and social toll, which may in turn result in poor control of blood glucose levels and an increased risk of complications (Donald et al., 2012).

Non-communicable diseases account for more than 50% of deaths in adults aged 15–59 years in most low income countries. Depression and diabetes carry an enormous public health burden, making the identification of risk factors for these disorders an important strategy (Leone et al., 2012).

Diabetes is known to give patients emotional stress especially when they have misconceptions about the condition and the way to manage it. When there is no family support, social support groups and favourable government policy interventions to make the condition bearable, it does not yield good treatment outcomes. Social support is defined as an individual’s perception regarding assistance from others that include various aspects such as emotional, financial or belonging support (Garrusi et al., 2013). Koopmanschap (2002) reported that a high degree of family acceptance and support has been shown to correlate with...
adherence to a treatment regimen and hence the ability to achieve and maintain good glycaemic control.

Diabetes also disrupts social identities and social roles. When individuals lose a limb, or their eyesight fails, the disability changes their identities, in their own eyes and in the eyes of their significant others (Aikins et al., 2013). Men who experience sexual dysfunction through the side effects of diabetes medications or through diabetes complications struggle to manage their lost or diminished masculine identities (Aikins et al., 2013). Disrupted social identities do not come only from the physical impairments or disabilities, but also from the implications these pose for individuals’ ability to work and earn a living. For example, some farmers in Kintampo and Nkoranza have to abandon their farming or develop new strategies, such as hiring farm help, to maintain their primary occupation (Aikins et al., 2013). Finally, the quality of social relationships changes within the context of chronic conditions. The changes range from a switch in social roles in the home to experiences of enhanced or dwindling social support (Aikins et al., 2013).

Chronic illnesses poses a huge burden on not just the health services/facilities but also the families of the patient and the patients themselves. It is known to affect the overall quality of life for most individuals and affect their psychological well-being. It has been suggested that the care of chronically ill people is often not optimal at clinics and that they then incorrectly access hospitals after-hours, in particular, in efforts to access what they perceive to be better care (Van Deventer et al., 2009). The ill health of individuals does not just affect them and their households but the state as well. It increases the time spent seeking care or in states of health that prevent work, thus reducing productivity and consumption (WHO, 2009).

There is a growing literature on the interaction between various patient-reported outcomes, demographic factors, the self-management of patients with chronic illnesses, and medical
outcomes. For instance, diabetes patients with higher levels of active self-management enjoy better health outcomes. In other words they are more engaged, informed, confident and become skilled patients who are more likely to perform activities that will promote their own health, and are more likely to have their health care needs met. Fostering patients to take on a meaningful role in their own care is therefore central to improving quality of care and health outcomes (Donald et al., 2012).

The income, occupation and educational status of an individual also affect the outcome of the condition. Education has from long ago been considered as the strongest health predictor because poor levels of health may adversely impact educational attainment and consequent levels of future income. At a societal level, poor population health is associated with lower savings rates, lower rates of return on capital, and lower levels of domestic and foreign investment; all of these factors can and do contribute to reductions in economic growth (WHO, 2009).

The rising prevalence of chronic diseases in low and middle income nations has been attributed largely to components of social class, namely literacy, family income and occupation (Rameswarapu et al., 2011). Available evidence from developed countries indicates that the burden of chronic diseases and their risk factors are predominantly concentrated among the economically poor. The poor appear to be disproportionately burdened with the risk factors associated with these diseases. People of lower social class are also at a greatest risk for non-compliance, lack of adequate access to healthcare and preventive care (Rameswarapu et al., 2011).

From the patient's perspective, minimising the burden imposed by diabetes requires an approach that ensures services are integrated, accessible and affordable. These services
should also be patient-centred, with a strong emphasis on supporting patients' confidence and ability to effectively manage their illness (Donald et al., 2012).

2.5 Lifestyle burden of diabetes and risk factors

It is now commonly admitted that diabetes is sweeping the globe as a silent epidemic largely contributing to the growing burden of non-communicable diseases and mainly encouraged by decreasing levels of activity and increasing prevalence of obesity (Boutayeb et al., 2004).

Lifestyle factors related to obesity, eating behaviour, and physical activity play a major role in the prevention and treatment of type 2 diabetes. Lifestyle modifications can be a very effective way to keep diabetes in control. Improved blood sugar control can slow the progression of long-term complications. Multiple small changes can lead to improvements in diabetes control, including a decreased need for medication (McCulloch et al., 2012).

The prevalence of risk factors for diabetes especially Type 2 is very high and could be largely attributed to rapid changes in lifestyle of people and is of concern globally. Findings from a systematic review and focus groups identified many environmental and personal determinants of these unhealthy lifestyle changes, including: less than ideal accessibility to and availability of health services; cultural values and norms; optimistic bias and other misconceptions related to risk; and low expectations regarding one’s ability to make lifestyle changes in order to influence health and disease outcomes (Daivadanam et al., 2013). Individuals with Type 2 diabetes are also at a significantly higher risk for coronary heart disease, peripheral vascular disease, and stroke, and they have a greater likelihood of having hypertension, dyslipidaemia, and obesity (ADA, 2004).

The first step in adjusting to being diagnosed diabetic is the change of lifestyle. Changing a lifestyle is not easy because most people like to stick to doing whatever they desire, such as
eating their favourite foods or taking their favourite drinks. Giving these up is difficult, and most patients find it hard to adhere to these restrictions. Doctors struggle to get patients to use insulin for many reasons, including denial, non-compliance, and resistance to treatment, fear, and even economic barriers (Nada, 2010).

Increasing urbanization coupled with a drastic decrease in physical activity and changes in dietary habits are all contributing factors. Obesity is a major and well known modifiable risk factor for CVD. Across many Sub-Saharan African (SSA) countries, obesity has been linked to both urban residence and wealth - the more wealth a person has, the more likely he or she is to be overweight or obese due to nutritional transition, transitions in energy expenditure due to urbanization and other unknown factors (Belue et al., 2009). There is also growing evidence that at glucose levels above normal but below the diabetes threshold diagnostic now referred to as pre-diabetes, there is a substantially increased risk of cardiovascular disease (CVD) and death. In these individuals, CVD risk factors are also more prevalent, which further increases the risk but is not sufficient to totally explain it (ADA, 2004). Available literature suggests that 'the exploding growth of cities' often resulting in mega-slums in many parts of SSA may substantially leads to deterioration in the health and well-being of people due to poor quality of urban housing, sanitation issues, and limited access to efficient health care systems, as well as mobility/transportation stress (Belue et al., 2009).

Alcohol, tobacco use and obesity are risk factors for cardiovascular disease especially in a diabetic patient. Tobacco use remains one of the most serious epidemiological risk factors in terms of prevalence of coronary artery disease. Over 25% of newly diagnosed diabetics are smokers which increases risk of bad cholesterol levels- low density lipoproteins (LDL) also known as dyslipidaemia. In a hospital-based study of 202 diabetics in Ethiopia (Belue et al., 2009), approximately 20% were smokers, all of whom were males. Alcohol consumption is
correlated with an increased risk for glucose intolerance and diabetes. In a study of rural and urban dwelling participants in Kenya by Christensen et al. (2009), it was found that excess alcohol consumption was related to increase likelihood of glucose intolerance by almost 4 fold among men (BeLue et al., 2009).

2.6 Health burden and its consequences associated with diabetes
The health care system is often challenged with lack of sufficient resources; both personnel and logistics to provide adequate patient care. A review by Motala (2002) noted that the increasing diabetes trends in Africa are influenced by inadequate health care infrastructure, inadequate supply of medications, and lack of available healthcare facilities and providers. Issues such as lack of protocols for diabetic complication evaluation and monitoring, little or non-existent referral systems, inadequate health facilities, and absence of multidisciplinary diabetic case teams also make diabetes care difficult (BeLue et al., 2009).

Beran et al., (2005) surveyed the availability of diagnostic testing tools in a sample of healthcare settings in three countries, and found that in Mozambique urine glucose strips were available in just 18% of health facilities surveyed; ketone testing strips in 8% and blood glucose metres in 21%, whilst availability in Mali was 54%, 43% and 13% and in Zambia 61%, 54%, 49% respectively. Low levels of adequate glucose control in diagnosed diabetics were reported in several prevalence studies (Hall et al., 2011). Only 27% of diagnosed type 2 diabetics receiving treatment in the Cameroon study had adequately controlled glucose levels (MOH, 2004). Of 99 type 1 diabetics in the Tanzanian survey, only one person achieved good glucose control. None of the 99 type 1 diabetics had the ability to monitor their glucose levels at home, and hospitals were unable to routinely do this (Majaliwa et al., 2007). A regular supply of insulin was unaffordable for many diabetics; with one month's insulin supply costing 19.6 days wages in Malawi and 25% of the minimum wage in Tanzania (Mendis et al., 2007). Hall et al., (2011) also reported that one Sudanese study found that 65% of a
family's annual household expenditure on health was spent on caring for a diabetic child (El Rayah et al., 2005). A study by Beran and Yudkin (2010) found that state interventions affected insulin price, reporting that an annual supply of insulin cost 5% of GDP in Mozambique, where it was subsidised by the government, whereas it cost 25% of GDP in Mali without subsidies. One study also investigated insulin availability and reported that one of five hospitals and none of six health centres surveyed had a regular insulin supply (Beran et al., 2005).

Besides having pressure on health facilities, diabetes mellitus is also known to have a serious health problem on its sufferers. Diabetes is known to cause a lot of medical complications; both short and long term complications many of which associated with premature death. Diabetes is a high risk for many complications including oral disease and pregnancy complications. These conditions contribute significantly to poor quality of life, work limitations, and increased risk of death; they also greatly increase the demand for health care resources and add to the costs of diabetes for society (PHAC, 2011). The complications of long term diabetes could be micro vascular (e.g. retinopathy and neuropathy) or macro vascular complications (e.g. myocardial infarction, angina pectoris and stroke). In addition to diabetes-related complications, episodes of hypoglycaemia, fear of hypoglycaemia, change in life style and fear of long term consequences may lead to reduced health-related quality of life (HRQoL). In fact, individuals with diabetes have reduced HRQoL compared with those without diabetes in the same age group, and their HRQoL decreases with disease progression and complications (Solli et al., 2010).

Although costly and time consuming to treat, the real impact of diabetes is through its complications. People with Type 2 diabetes are twice more likely to have a heart attack or stroke than non-diabetics. Atherosclerotic cardiovascular disease (CVD), with coronary heart
disease (CHD) as its principal manifestation, is now established as the major contributor to chronic illness and early death in many individuals with Type 2 diabetes. Even though it is still unclear whether diabetes is responsible for CHD in these people, or Type 2 diabetes mellitus share a common underlying pathogenesis accounting for the strong association between them (Kent et al., 2010). A Nigerian study (BeLue et al., 2009) among diabetics also demonstrated high prevalence of dyslipidaemia among Type 2 diabetics. Results of a study comparing healthy people and Type 2 adult diabetes showed significant association of triglycerides and (HDL-C) high density lipoprotein cholesterol with advancing age, female gender, obesity, physical inactivity and inadequate glycaemic control (BeLue et al., 2009). In a hospital study in Kenya, elevated levels of total cholesterol and triglycerides requiring therapeutic intervention were noted in Type 2 diabetic patients with no obvious complications (BeLue et al., 2009).

Diabetes mellitus is a common secondary cause of hyperlipidaemia (high levels of cholesterol or fat in the body), particularly, if glycaemic control is poor, which in-turn is an important risk factor for atherosclerosis and coronary heart disease. The spectrum of dyslipidaemia (abnormally low or high levels of fat or cholesterol in the body) in diabetes mellitus can include all the various types of dyslipidaemia identified in the general population; however, one phenotype is particularly common in diabetes mellitus, which is attributed mostly to insulin resistance and insulin deficiency. The characteristic features of this phenotype are a high plasma triglyceride concentration, low HDL cholesterol concentration and increased concentration of small dense LDL–cholesterol particle (Jayarama et al., 2012). In U.S., 67% adults who report having diabetes also report having high blood pressure. For people with diabetes, high blood pressure levels, high cholesterol levels, and smoking increase the risk of heart disease and stroke (CDC, 2012). Approximately 15% of hypertensive patients are diabetic and 75% of Type 2 diabetic patients are hypertensive. People with both DM and
HPTN have approximately twice the risk of CVD than a non-diabetic person with HPTN. Diabetes itself is considered a risk factor of CVD, the presence of HPTN in a diabetic individual, however, increases morbidity and mortality (Min et al., 2010). Prevalence of HPTN in patients with DM is 1.5 - 2 times greater than in an appropriately matched non-diabetic population (Saleem-ur-Rehman et al., 2014).

Diabetes (all types) is the most frequent cause of kidney failure and amputations. These are all extremely costly, more costly in fact than treatment and monitoring of diabetes itself (Kanavos et al., 2012). Cigarette smoking among people with diabetes is also associated with an elevated risk of cardiovascular disease and stroke, increased insulin resistance, and various complications such as diabetic nephropathy, retinopathy, neuropathy and lower extremity amputations (Fan et al., 2013).

2.6.1 Diabetes and bacterial infections

The relative risk of cardiovascular disease is doubled in persons with periodontal disease (Pradhan and Goel, 2011). Periodontal and cardiovascular disease share many common risk and socioeconomic factors, particularly smoking, which is a powerful risk factor for both diseases. Periodontal disease is a common bacterial infection of the supporting structures of the teeth. Periodontitis is a chronic infection associated with substantial morbidity in the form of tooth loss and that affects the quality of life directly. The association between diabetes and inflammatory periodontal disease has been studied extensively (Pradhan and Goel, 2011). The severity and prevalence of periodontitis are increased in persons with diabetes and are worse in persons with poorly controlled diabetes, a risk for heart disease. Periodontitis may exacerbate diabetes by decreasing glycaemic control. The relationship between these two conditions appears bidirectional (Pradhan and Goel, 2011).
Diabetes is known to increase the risk for multiple infections with serious infections a common reason for hospital admission. There is growing evidence that some infectious diseases precipitate chronic diseases and that some chronic conditions place sufferers at risk of infectious diseases (Aikins, 2007). Infection is one of the major causes of hospitalization of diabetic patients. Numerous studies revealed that urinary tract, respiratory tract, and soft tissues are the major sites prone for infections commonly found in diabetic patients. Altered host defence mechanism, vascular abnormalities, and frequent hospital admissions are responsible for its increased incidence (Sunnesh Reddy et al., 2013). Patients with diabetes have higher risk for bacterial and viral infections leading to complications and high morbidity and mortality, and have been identified as an independent risk factor for developing respiratory tract infections (Mohan et al., 2011). Evidence from other countries shows an association between diabetes and other infectious diseases. Type 2 diabetes is associated with a 25-75% increased risk of pneumonia and pneumococcal bacteraemia leading to hospitalization, and longer duration of diabetes, diabetes complications, and poor long-term glycaemic control increase the risk. Diabetes increases the risk of developing severe sepsis, with one study reporting a 2.5-fold increased risk for hospitalization with sepsis in diabetic individuals compared to the general population (Hall et al., 2011).

Patients with diabetes mellitus have a two to three fold increased risk of bacteraemia (bacteria in the bloodstream) and sepsis originating from the urinary tract compared with those without diabetes. Among 11 patients newly admitted with Type 1 diabetes at a teaching hospital in Nigeria, 9 (82%) presented with urinary tract infection, malaria, or recurrent boils (Hall et al., 2011). Bacteraemia risk due to haemolytic streptococci and staphylococci is also increased two to three-fold in patients with diabetes, and often originates from wound infections, which are an important health problem in the region (Hall et al., 2011). Several controlled studies have demonstrated a higher incidence of bacteraemia (presence of bacteria in urine), by a
factor of two to four in diabetic women than in non-diabetic women. Whether this increase is due to the increased use of urinary tract catheters in these women or to diabetes itself is debatable. Diabetes may also predispose patients to more severe infections of the upper urinary tract; the upper tract is involved in up to 80% of urinary tract infections in diabetic patients. Complications also occur more frequently in diabetic patients than in non-diabetic patients with established urinary tract infections. Diabetes is also a common predisposing factor for urinary tract infections caused by fungi, particularly candida species (Joshi et al., 1999).

Foot infections are the most common soft tissue infections in people with diabetes. International epidemiological studies suggest that 2.5% of diabetic patients develop foot ulcers each year, and 15% of all diabetic patients develop foot ulcers during their lifetime. Thus, increasing the risk of death by 2-4-fold compared with diabetic patients without ulcers (Yekta et al., 2011). Foot ulceration is a common and disabling complication of diabetes with considerable economic and public health, and the lifetime risk of a person with diabetes developing this complication may be as high as 25%. A history of previous diabetic foot ulceration increases the risk for new ulceration. Foot ulcers precede approximately 85% of all diabetic lower extremity amputations, and the mortality following amputation is high (Iversen et al., 2009). More than 25 million people in the United States are estimated to have diabetes mellitus, and 15-25% will develop diabetic foot ulceration during their lifetime (Hobizal and Wukich, 2012). Over 50% of these ulcerations will be infected, resulting in high rates of hospitalization, increased morbidity and potential lower extremity amputation. It is a most cause of diabetic hospitalization and readmission rates for diabetic foot infections (DFI) are approximately 40%, with nearly one in six patients dying within 1 year of their infection (Hobizal and Wukich, 2012). Complications of diabetes, including diabetic foot ulcers, have a major negative effect on HRQoL. Qualitative research has confirmed the clinical
observation that diabetic foot ulcers have a huge negative psychological and social effect. Armstrong et al., (2008) suggested that patients with diabetic foot ulcers have severely impaired physical and mental functioning, which is comparable with those with other serious medical conditions. Another study in 2005 also revealed that HRQoL of patients with chronic neuropathic and neuroischemic foot ulcers, without critical limb ischemia, is poor and comparable with, for instance, the HRQoL of patients with relapsed breast cancer (Yekta et al., 2011).

Cutaneous signs of diabetes mellitus are extremely valuable to the clinician. They generally appear after the primary disease has developed but may signal or appear coincidentally with its onset, or even precede diabetes by many years (Goyal et al., 2010).

2.6.2 Diabetes health burden and tuberculosis

A recent meta-analysis of thirteen studies found that diabetes was associated with a 3.1 times (Baker et al., 2011; Hall et al., 2011) elevated risk of tuberculosis, and a systematic review of 9 studies found that this increased risk varied from 1.5 to 7.8. Hall et al., (2011) reported certain studies have suggested that 20% of smear-positive tuberculosis in India and 25% of tuberculosis in Mexico is attributable to diabetes. The increased risk of tuberculosis associated with diabetes may be largely attributed to poor glycaemic control. Unfortunately, there are no proper epidemiological studies of the diabetes-tuberculosis association from Africa (Hall et al., 2011).

Diabetes is known to contribute to the incident of tuberculosis in a study conducted using India as an example. Diabetes and acquired immunodeficiency syndrome (HIV/AIDS) are known to both increase susceptibility to TB. In 2000, there were an estimated 20.7 million adults with diabetes and 900,000 incident adult cases of pulmonary tuberculosis in India. It is estimated that the increased diabetes prevalence in urban areas is associated with 15.2%
greater smear-positive tuberculosis incidence in urban than rural areas and the current
diabetes epidemic may lead to a resurgence of tuberculosis in endemic regions, especially in
urban areas (Stevenson et al., 2007). In a newspaper (the Times of India) posted on 23 March
2014; there was an article on how diabetes in TB infected persons has become a challenge for
those involved in controlling TB. It stated that “the co-existence of these two diseases can be
seen as a convergence of two imminent epidemics especially in developing countries like
India”. Infections including tuberculosis often worsen glycaemic control in diabetic patients,
and poorly controlled diabetes might in turn augment the severity of infections. WHO reports
propose diabetes screening for all people with TB (Isalkar, 2014; The times of India). A
previous study has demonstrated that DM not only increases the risk of TB but also adversely
affects anti-TB treatment (Wang et al., 2014). DM greatly diminishes the immune function of
the human body, causing decreased protein synthesis and increased protein consumption,
leading to a decreased ability to produce immunoglobulin and hindering lymphocyte
transformation for immune protection. Patients with DM are at a high risk of TB and that TB
can increase the occurrence and development of DM (Wang et al., 2014).

2.6.3 Gestational diabetes and health consequences
Morbidity and mortality rates are known to be higher among women with diabetes. Women
with gestational diabetes mellitus are believed to be at risk of developing Type 2 DM in the
future. Infants of mothers with pre-existing diabetes mellitus experience double the risk of
serious injury at birth, triple the likelihood of caesarean delivery, and quadruple the incidence
of new-born intensive care unit (NICU) admission (Moore et al., 2014). Diabetes is known to
cause serious complications in pregnancy which can be fatal to both the mother and the baby.
Diabetes is known to be a risk factor for neonatal jaundice, pre-eclampsia, respiratory distress
syndrome, birth defects and miscarriages (Stoppler, 2013). The most common adverse
outcome includes premature deliveries, a great variety of congenital abnormalities and
malformations for the baby and pre-eclampsia, haemolysis, elevated liver enzymes, low platelets syndrome, caesarean section, hypoglycaemia and the worsening of any degree of a pre-existing renal insufficiency and retinopathy on the maternal side (Negrato et al., 2012). Pregnancy loss is significantly higher among women with diabetes compared to the non-diabetic population. Recently, a population-based cohort study conducted in the UK has shown that women with type 1 diabetes have a higher risk of late foetal loss, presenting a four- to five-fold increase in perinatal death, and a four- to six-fold in stillbirth compared to the general population (Negrato et al., 2012). Neonatal mortality is also higher among infants of diabetic mothers in approximately 15-fold when compared to the general population. Schaefer et al., 1997 have found a two-fold increase in the risk of congenital anomalies when fasting glucose levels are already greater than 120 mg/dL when first detected during pregnancy. The increased risk of congenital abnormalities found in diabetic mothers seems to be associated to poor metabolic control during the period of organogenesis that occurs in the first trimester of pregnancy probably due to the negative impact of a hyperglycaemic milieu in the growing foetus (Negrato et al., 2012).

2.6.4 Diabetes and sexual dysfunction

Diabetes is an established risk factor for sexual dysfunction in men. In women evidence regarding the association between diabetes and sexual dysfunction is less conclusive, although most studies have reported a higher prevalence of female sexual dysfunction (FSD) in diabetic women as compared with non-diabetic women but appears to be more related to social and psychological components than to physiological consequence of diabetes (Maiorino et al., 2014).

Men with diabetes are two to three times more likely to develop erectile dysfunction (ED). Erectile dysfunction defined as the persistent inability to achieve or maintain penile erection for successful sexual intercourse causes a decreased quality of life in men (Maiorino et al.,
Erectile dysfunction is associated with depression which affects quality of life. Men with erectile dysfunction often have other comorbidities; hypertension and coronary artery disease (Shabsigh et al., 2010). In many cases, problems with achieving or maintaining an erection is an early clue that you may be diabetic, particularly in men 45 and under since advanced age and longer duration of diabetes is associated with increased risk of ED (Santos-Longhurst, 2013). Erectile dysfunction is a "powerful" predictor of coronary heart disease/cardiovascular disease events, including death, in type 2 diabetics. Studies showed that type 2 diabetic men with angiographically proven asymptomatic coronary artery disease, the presence of ED was associated with a doubling of risk for a major cardiac adverse event over 4 years (Gazzaruso et al., 2008). However, diabetic people may present with several clinical conditions, including hypertension, overweight and obesity, metabolic syndrome, cigarette smoking, or atherogenic dyslipidaemia, which are themselves risk factors for sexual dysfunction in both sexes (Maiorino et al., 2014).

2.6.5 Diabetes and adolescents

In adolescents, diabetes is a big challenge especially in adolescents with insulin dependent diabetes mellitus. Even though insulin is essential for their survival, daily administering is a constant reminder of the presence of a chronic disease capable of stimulating a feeling of disability and inadequacy (Onyiriuka and Ehkator, 2013). The clinical implication is that during puberty with the associated rapid growth the amount of insulin required might change, necessitating frequent hospital contacts in order to adjust the insulin dosage (Onyiriuka and Ehkator, 2013). The resultant increased restriction and intrusions in the way of life of the adolescent is in direct conflict with the basic developmental concepts of personality structure, such as body image, the ego structure and the identity process which are the principal preoccupation of adolescents. Such developmental conflict may engender rebelliousness and
Many chronic medical conditions are complicated by emotional and psychological disorders and yet the emotional dimensions of such chronic medical conditions are often overlooked when medical care is considered. Patients with chronic medical conditions often have to adjust their aspirations, lifestyle, and employment. Many grieve about their predicament before adjusting to it (Igwe et al., 2013).

2.7 Psychological burden associated with diabetes

The rate of diabetes as a cause of disease burden has increased over time. Psychological well-being could be considered as an important factor in improving chronic disease management and decrease of mortality and morbidity of disease (Garrusi et al., 2013).

Many chronic medical conditions are complicated by emotional and psychological disorders and yet the emotional dimensions of such chronic medical conditions are often overlooked when medical care is considered. Patients with chronic medical conditions often have to adjust their aspirations, lifestyle, and employment. Many grieve about their predicament before adjusting to it (Igwe et al., 2013).

The physical impact of diabetes is well reported but the emotional stress involved is often ignored. Diabetes has been proven to have many psychological effects including fear, non-compliance and depression. People who suffer from the chronic disease such as diabetes may also suffer adverse psychological effects, whether they know it or not, that may impede the way the diabetics act or live everyday (Nada, 2010).

The day to day management of diabetes is demanding and can take a heavy psychological and social toll, which may in turn result in poor control of blood glucose levels and an increased risk of complications (Donald et al., 2012). People living with diabetes go through a process of guilt and denial, which usually begin upon being diagnosed and the onset of complications. A “challenging or emotional diagnosis” was often mentioned as having a significant impact on the ability to cope with diabetes (Stuckey et al., 2014). Emotional words included shock, surprise, “fall apart,” traumatic time, scared, nervous, stunned, frozen,
and depressed. People with diabetes reported going to the doctor or hospital for one problem and then leaving with an unexpected diagnosis of diabetes (Stuckey et al., 2014).

Diabetes distress is a rational emotional response to the threat of a life-changing illness. The lack of perceived support from family, friends and healthcare professionals significantly contributes to elevated diabetes distress, and this issue tends to be overlooked when designing interventions (Berry et al., 2015).

Accepting the diagnosis of a chronic illness is a process of adjustment and psychological stress sets in when the adjustment is not successfully achieved especially due to their understanding of the illness. People then tend to feel apart from their friends and families because of the changes in lifestyle, financial cost and other changes they have to go through in order to live with and manage their condition. The many complications of diabetes are enough to significantly impact the quality of life of individuals and lead to depression.

Depression has been identified as being more common among people with diabetes, a common co-morbidity occurring twice as often among individuals with diabetes than among those without (Kent et al., 2010). Clinical depression is a common problem among patients who seek medical care, and diabetic patients with comorbid depression tend to have higher health care cost (Agbir et al., 2010). At any single point in time, approximately one-third of diabetic patients have symptoms of depression severe enough to warrant treatment. However, depressed adults have 37% increased risk of developing type 2 diabetes mellitus (Rahman et al., 2011). Depressive symptoms in people with diabetes mellitus are of concern because of their association with poor diabetes self-management (i.e., diet modification, physical activity, insulin injections) and an increased risk for diabetes-related complications (Kaholokula et al., 2003). Furthermore, comorbid depression in people with diabetes mellitus is associated with functional disability, low work productivity, and low health service use. As
The high prevalence of comorbid depression and diabetes suggests that these disorders may be related. Depression has been proposed as both a result of and precursor to diabetes, with this relationship attributed to a variety of mechanisms (Riley et al., 2009). Yet the causal relationship between these disorders, its direction, and underlying mechanisms remain unclear. Some authors have proposed that depression may stem from the psychosocial burden and/or biochemical changes related to diabetes and its treatment (Riley et al., 2009).

Evidence from high income countries suggests that depression among people with diabetes is associated with socio-economic status, marital status, and physical activity and chronic somatic diseases. Psychosocial factors may mediate the relation between socio-economic status (SES) and depression in people with diabetes, including social isolation or social support, coping styles, behaviour and job stress or strain. Most studies show inverse social gradients, meaning that the risk is higher for people with lower SES (Leone et al., 2012). However, the relationship may vary depending on the social and economic context of the country. In low income countries (LICs), higher SES may be associated with higher levels of chronic disease risk factors in general while the poor experience a double burden of infectious and chronic diseases according to the protracted polarised model of epidemiological transition (Leone et al., 2012). In addition, the burden of risk factors for depression among people with diabetes in particular has been found to shift towards the less affluent in countries undergoing the epidemiologic transition where the cause of deaths shifts from infectious to non-infectious causes (Leone et al., 2012).
2.8 Coping strategies

Coping has been defined as a response aimed at diminishing the physical, emotional and psychological burden that is linked to stressful life events and daily hassles. Coping is strongly associated with the regulation of emotions throughout the stress period. The coping strategies used to deal with diabetes can play a key role in the maintenance and duration of, and psychosocial adjustment to diabetes (Tuncay et al., 2008).

Coping with the implications of one's diabetes related problems could be a difficult and often lifelong process. Patients may cope by adjusting their social role to fit the demands and challenges associated with the illness, or they may cope by trying to reframe their experiences viewing the situation in a more positive light. Accepting the reality of the diagnosis and developing a positive attitude toward treatment is thought to be critical for successful coping and recovery. Delineation of coping strategies might be useful for identifying patients in need of particular counselling and support thereby improving the psychosocial wellbeing of patients (Tuncay et al., 2008).

Coping can be classified as problem-focused or emotion-focused. The problem-focused coping strategies comprise all coping mechanisms which directly address the stressor, while emotion-focused coping strategies regulate the emotions associated with the stressor. Problem-focused strategies are thought to be more functional (Kalra et al., 2009). Problem oriented coping can further be classified as cognitive (thought patterns related to coping) and behavioral (action related to coping). Cognitive coping skills are usually stable for any individual, as she or he tends to behave in a similar manner when faced with various stresses. However, they can be changed, learned, unlearned and influenced by oneself, or through influence of others (Kalra et al., 2009).

In Ghana, Churches, mosques and other faith-based institutions play an important role in health promotion. Churches have been visible facilitators of mass health walks, screening and
health expert talks on public health problems (Aikins et al., 2010). Research suggests that the church is an important source of information for lay people; similarly people with chronic diseases rely on their churches for information and psychosocial support (Aikins et al., 2010).

On the other hand religious institutions offer chronic disease treatment through their faith healing prayer camps or through Islamic divination. The impact of these practices is mixed. Research suggests that faith healing practices can cause disease complications for people with diabetes (Aikins et al., 2010). People with diabetes engaged in nuanced legitimation processes when choosing practical information for diabetes care, especially with respect to pluralistic healthcare services. They engaged in four kinds of illness practices: biomedical management, spiritual action, cure-seeking and medical inaction. These forms of illness action highlighted the complex and unpredictable relationship between knowledge, beliefs and health seeking behaviours. Similar findings to the Ghanaian study are reported elsewhere in the region, including in Cameroon (Aikins et al., 2010).

2.9 Conclusion

Review of various literatures showed the psychological and social burdens of living with diabetes. Ghana has a significant diabetes burden (Aikins et al., 2013). This ranges from the daily difficulty of complying with drugs and diet management to the financial cost of treatment, reduced functional abilities and changed social roles (Aikins et al., 2013). The heavy psychosocial burdens from diabetes for patients and their families continue to be largely underestimated and ignored exacerbating the burden and affecting their health related quality of life (HRQoL). Diabetes management should be to promote patient-centred health care, self-management and psychosocial support while also getting family members more closely involved (EHFG, 2013). This can serve as a justification to assess the psychosocial burden associated with diabetes in the Tamale metropolis and this study seeks to be the first.
CHAPTER THREE
3.0 METHODOLOGY

3.1 Introduction
This chapter includes the characteristics of the study area, data collection methods and tools, sampling techniques and methods of analysis.

3.2 Background of study area
The study was conducted in the Northern Region of Ghana, with Tamale as the capital, which is the fourth largest city in Ghana. The region shares boundaries with Upper East and West regions on the north, on the west with Ivory Coast, on the east with Togo and on the south with Brong Ahafo and Volta regions. Northern Region's total population is 2,479,461 (www.ghanadistricts.com). The total male population is 1,229,887 while the females numbered 1,249,574. According to 2010 population census, the total population for Tamale Metro was 371,351 comprising 185,995 males and 185,356 females (Ghana Statistical Service, 2013).

The Tamale Metropolis is located in the centre of the Northern Region and shares boundaries with 5 other districts. The Metropolis has a total estimated land size of 70,383 square km which is about 13% of the total land area of the Northern Region. There are 197 communities in the Metropolis of which 164 are rural. The land is mostly low lying except in the northeastern corner with the Gambaga escarpment and along the western corridor. The region is drained by the Black and white Volta and their tributaries, Rivers Nasia, Daka, etc.

Tamale Teaching Hospital (TTH) in the Northern Region was established in 1974 by Lt. Col. I.K. Acheampong the head of state of Ghana. TTH is a regional hospital that provides health care services to the citizens of Tamale and all of northern Ghana as well as the neighbouring countries of La Cote d'Ivoire, Burkina Faso and Togo. The Hospital is located in the Eastern
part of the Tamale Metropolis with a total land surface area of 490,000 square meters, of which only 122,500 square meters has been developed. In 2008 the hospital obtained the accreditation needed to operate after being upgraded to a tertiary health care centre some years back and provides services in the necessary departments for effective and efficient function of the Hospital. The Hospital has a population of 2.1 million in its catchment area with 340 bed compliments. The hospital began operating diabetic clinic 20 years ago and due to the growing number of diabetic patients; the hospital now provides services (diabetic clinic) twice in a week; Tuesdays and Fridays (Health Information Unit, 2000).

Tamale Central Hospital (TCH) started operation in December 2004 with only the maternity block but began fully in 2005 January with Outpatient Department (OPD), reproductive health and child welfare with only 2 staff. The hospital became autonomous in April 2007. The hospital has a staff strength of 172 (both clinical and non-clinical) as of 2011 with a registered patient number of 100,000. Due to its location in the centre of town, the hospital receives many emergency cases. Currently the hospital operates all major departments needed to provide quality services to all patients. The hospital provides diabetic clinic once a week on Thursdays for people with diabetes (Health Information Unit, 2006).

Tamale West Hospital (TWH) was established on 1st April 1998 as a polyclinic and gradually graduated to the status of a district hospital in the same year. It covers a total surface area of about 8.87 acres with a bed compliment of 121. The hospital serves the people of Tamale and its environs with a population of not less than 290,000 and provides 24 hour service. It has 55 registered diabetic patients since the beginning of the year and provides diabetic care services first Wednesday of every month. The hospital began operating diabetic clinic January 2014 (Health Information Unit, 2001). The study was carried out at the outpatient units of all the three government hospitals; the Tamale Teaching Hospital and two regional hospitals (Tamale Central and Tamale West) within the metropolis. They were chosen taken
into consideration the accessibility of location, accessibility to patients, disease prevalence and these being the 3 main hospitals within the Tamale metropolis that provide diabetic services to all the surrounding towns and villages.

3.2 Study design
The study is a descriptive cross sectional study carried out in the Tamale metropolis. This was to help investigate the associations between risk factors (socio economic variables) and the outcome of interest (psychosocial burden) within the diabetic study population at the time of the research.

3.2.1 Study population
Patients qualify to be part of the study by means of being diabetic and attending routine clinic at any of the Hospitals. For the basis of this study, a type I diabetic patient is one diagnosed below or up to the age of 35 years, type II diabetic patient is one diagnosed above the age of 35 years and gestational diabetics are all women who were diagnosed diabetic when they were pregnant (whether they are still carrying the pregnancies or have given birth but are still on diabetes medications).

3.2.2 Sample size
The sample size was estimated as 209 patients using Snedecor and Cochran, (1989) sample size formula: 

\[ n = \frac{(1.96)^2 \times p \times (1-p)}{m^2} \]

at a prevalence rate of 16.2% for the nation. Power of 80% at significance level of \( p < 0.05 \) and confidence level of 95%.

\[ n = (1.96)^2 \times 0.162 \times \frac{(1-0.162)}{(0.05)^2} \]
\[ n = 3.84 \times 0.162 \times (0.838)/0.0025 \]
\[ n = 209 \text{ respondents} \]
3.2.3 Sample frame

The sample frame was all diabetics that were registered and attending monthly diabetic clinic at any of the hospitals involved who gave their informed consent were enrolled into the study. Patients who were excluded were those who did not give their informed consent or were not present at the time of data collection. The study was centred on people living with diabetes who answered a structured questionnaire which was completed in the 3 government hospitals in the Tamale metropolis that the study was carried out. In each case, the study was conducted in accordance with the relevant ethics requirement. The questionnaires were pretested and all mistakes corrected to improve it validity and reliability.

3.2.4 Sampling

A proportionate sampling technique was employed in the collection of data since there were three unequal diabetic population to sample from. It was also done to have sufficient sample size large enough to present each population and still be able to focus on the particular characteristic/trait of interest in order to answer the research questions. Below are the number of registered patients and health care professionals at each hospital.

- TTH- 215 registered diabetics, 1 doctor, 3 diabetic educators, 1 dietician
- TCH- 110 registered diabetics, 2 diabetic educators and 1 dietician
- TWH- 55 registered diabetics, 1 diabetic educator and 1 nurse

From the proportions and a sample size of 209, it was required to sample 118 respondents from TTH, 61 respondents from TCH and 30 from TWH. All respondents were interviewed at the diabetic clinics of the various hospitals where they go for their monthly routine check-up. Informed consent was sought from participants aged 18 years and above and from guardians/parents who had accompanied their children under 18 years to the clinic. People with diabetes were approached and completed the survey in a face-to-face interview lasting about 35-40 minutes for each patient.
3.2.5 Data collection tools and techniques

Consistent with the objectives of the study for determining the psychosocial burden of diabetes mellitus in the Tamale metropolis, the three main government hospitals in the metropolis operating diabetic clinics were visited to identify and interview diabetic patients. Questionnaires and interviews were the major tools for data collection. Structured questionnaire of both open and closed ended questions was administered to patients/clients. Questionnaires were administered to patients to find out the health, financial, social burden as well as lifestyle changes they have gone through that prevents or enables them to effectively manage their condition. Most of the questions were open ended as a way of encouraging patients to express themselves. A face-to-face interview was held with the care providers who are directly in charge of diabetics at the various diabetic clinics. Contact tracing was done for patients who agreed to their relatives being contacted. The psychological burden of diabetes was assessed by administering Patient Health Questionnaire 9 (PHQ 9) developed by (Kroenke and Spitzer, 2002) to the patients and patient relatives.
3.3 Study Variables

This portion of the chapter covers the dependent (depressive symptoms) and independent (demographic characteristics) variables included in the study.

### Table 1: Definition of study variables

<table>
<thead>
<tr>
<th>Study variable</th>
<th>Explanation</th>
<th>Dependent/ Independent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio demographic data</td>
<td>Characteristics such as age, educational level, occupation, income level</td>
<td>Independent</td>
</tr>
<tr>
<td>Intangible cost</td>
<td>Functional disability and emotional health</td>
<td>Independent</td>
</tr>
<tr>
<td>Psychological health</td>
<td>Depressive symptoms identify using PHQ 9</td>
<td>Dependent</td>
</tr>
<tr>
<td>Clinic attendance</td>
<td>Accessibility of medical care by respondents</td>
<td>Dependent</td>
</tr>
<tr>
<td>Coping strategies</td>
<td>Mechanisms adopted by respondents to help cope with the burden of the disease</td>
<td>Dependent</td>
</tr>
</tbody>
</table>

3.3.1 Financial burden

This is the cost related to the diagnosis and management of diabetes including the buying of drugs and equipment needed to monitor blood glucose level. This includes the direct cost of transportation to and from the health facility every month and that of their relatives who accompanied them. This also includes patients who pay for medicines that are not covered by health insurance or buy extra medicines because their routine ration is not enough to last the entire month. Additional healthcare cost incurred due to other diseases or chronic illnesses. It also assessed the financial burden on families or relations of patient who have to take up that cost because the patient cannot fully take care of it.
3.3.2 Indirect cost/emotional burden

These are costs that are impossible to measure and value in terms of fiscal cash. Indirect costs of diabetes include income reduction due to missed work, reduced productivity, and inability to do any active or physically demanding job due to their conditions. The waiting times at the various hospitals for the diabetic patients, from the picking of folders to the receiving of drugs as well as how their individual finances influence their ability to assess healthcare. This also includes pain and suffering associated with treatment regimens, stigma of the disease, fear of death and any psychological stress associated with complications development. The time spent caring for relatives on admission and the time spent in providing assistance for daily activities was also assessed.

3.3.3 Psychological burden

Psychological burden of diabetes on the patients was evaluated by the use of patient health questionnaire 9 (PHQ 9). This questionnaire was to help mainly find out the depressive state of all the respondents. The nine item depression module for the PHQ 9 is well validated and widely used as a brief diagnostic and severity measure and it is a standard instrument for diagnosing depression in primary care and has now proven to be a response and reliable measure of depression treatment outcomes (Löwe et al., 2004). The term “depression” in this study referred to the self-report of depressive symptoms identified in the PHQ 9 by the patients. The PHQ-9 is used as a screening tool, with recommended cut-off scores of 10 or greater being found to have 88% sensitivity and 88% specificity for a diagnosis of major depression (Roy et al., 2012).

The format for the PHQ 9 is for participants to tick any of the four phrases identified by numbers that best describes their state in the past two weeks including the day the questionnaire was answered (Sweileh et al., 2014).
Table 2: How to review the severity score using the Table below.

<table>
<thead>
<tr>
<th>PHQ-9 Scores</th>
<th>Provisional Diagnosis</th>
<th>Patient Treatment recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>None</td>
<td>Support, educate</td>
</tr>
<tr>
<td>5-9</td>
<td>Mild depression</td>
<td>Support and educate to call if worse</td>
</tr>
<tr>
<td>10-14</td>
<td>Moderate depression</td>
<td>Support, watchful waiting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Antidepressant or psychotherapy</td>
</tr>
<tr>
<td>15-19</td>
<td>Moderately severe depression</td>
<td>Antidepressant or psychotherapy</td>
</tr>
<tr>
<td>20-27</td>
<td>Severe depression</td>
<td>Antidepressant and psychotherapy</td>
</tr>
</tbody>
</table>

Source: Kroenke and Spitzer, 2002

Scoring is done by adding up all checked boxes on PHQ-9

- Not at all: \((\#) \times 0 = \) __
- Several days: \((\#) \times 1 = \) __
- More than half the days: \((\#) \times 2 = \) __
- Nearly every day: \((\#) \times 3 = \) __

Total score: __

Validity has been assessed against an independent structured mental health professional (MHP) interview.

All “not at all” has a score of 0 (zero), “several days” has a score of 1, “more than half the days” has a score of 2 and “nearly every day” has a score of 3. The severity score is then calculated by counting the total number of “not at all” ticked and multiplied by 0. Then count the total number of “several days” ticked and multiply by 1. The same is done for “more than half the days” which is multiplied by 2 and “nearly every day” multiplied by 3. It is then added to obtain the total score. (See Appendix B on page 100).
3.3.4 Coping mechanisms

The methods adopted by patients to enable them cope with the condition and any specific means aside medical care, their perception about getting better, how the relation and attitude of the health worker affect or influence their condition was assessed. The social support received from their religious organizations and their families were equally assessed. It assess methods employed by relatives to help with the stress associated with caring for a chronically ill family member.

3.3.5 Diabetic clinic attendance

In order to assess whether socio economic variables influence the accessibility of medical care by the respondents, their clinic attendance was evaluated. This refers to routine clinic attendance by respondents for their monthly ration of drugs/medications. This assesses attendance of respondents, how regularly they attend or default and their reasons for that.

3.4 Data Analysis

Data was analysed using SPSS software version 20.0 (SPSS Inc., Chicago, IL, USA). Distribution of quantitative variables was summarized as mean ± SD. Descriptive statistics were calculated to summarize study variables. Binary logistics regression was used to test for strength of association between dependent and independent variables and possible predictors of psychosocial burden. The level of depression (dependent variable) used in analysis refers to the total score of depressive symptoms calculated from the PHQ 9 and divided into 2 main groups (0-9) and (10-27) for binary regression. Diabetic clinic attendance (dependent variable) used in analysis refers to routine clinic attendance by respondents coded as yes and no for binary regression model. Values and associations were considered significant of $P < 0.05$. 
3.5 Ethical Issues

An introductory letter was obtained from the department of community health and development and submitted to the 3 government hospitals in the Tamale metropolis. Permission was given by the administrators of these hospitals and the in charges of the diabetic clinics, who in turn also helped and cooperated in the collection of the data. Informed consent was obtained from all study subjects. All eligible patients were provided with information about the aim and content of the study and given written consent before participating in the study. The participants were also informed that their participation was voluntary and that they could withdraw from the interview/study at any time without consequences and all responses received would be kept confidential.
4.1 Introduction

This section contains the findings of the study based on statistical analyses and are presented in tables where appropriate.

4.2 Socio demographic data of diabetic patients

A total of 293 diabetic patients were assessed during the study period. Of these 147 (50.2%), 99 (33.8%) and 47 (16.0%) of them were obtained from Tamale Teaching Hospital (TTH), Tamale Central Hospital (TCH) and Tamale West Hospital (TWH) respectively.

The mean (standard deviation) of the ages in years is 53.2 (13.3) years. The vast majority 226 (77.4%) of the respondents were females with less than 30% representing the male population. The low men population assessed could be attributed to the fact that most men hardly report to the hospital unless in a critical or worse condition. With regards to the educational status of the study participants it was observed that 171 (58.4%) have not had any form of formal education whiles 38 (13%), 61 (20.8%) and 23 (7.8%) had at most some form of tertiary, secondary and primary education respectively. The analyses indicate that those who were engaged in formal sector of the economy such as teaching, public servants represent 41 (14.0%). Unemployment among the patients was 61 (20.8%) whiles about 151 (51.5%) were engaged in the informal sector of one economic activity or the other ranging from petty trading to artisans. There were 18 pensioners (6.1%), 4 (1.4%) students and 18 (6.1%) full time house wives. The result indicated that diabetes is no respecter of persons and affects individuals irrespective of sex, age, educational level, employment status and location.

Another economic variable assessed in the survey which could have an impact in their perceived disease burden was their income level. The findings showed that every month only
31 (10.6%) earned at most GHC100.00, 75 (25.5%) earned between 101-200 GHC and finally 26 (8.9%) and 62 (21.2%) earned between 201-300 and at least 300 GHC respectively. However, 88 (30.1%) did not know how much income they make monthly because they were unable to keep track of their income. The results of this survey showed that of all the study participants, 195 (66.6%) of them had at most 4 dependents to take care of and close to 30.0% had to care for about 5-9 dependents with about 6.0% of the respondents also catering for at least 10-16 persons in their families. As at the time of the study a little over 70.0% were married, less than 3.2% had divorced, about 22.2.0% were widowed. It was also observed that 13 (4.4%) were not married.
<table>
<thead>
<tr>
<th>Socio-demographic variable</th>
<th>Frequency (n) and (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex of respondents</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>226 (77.4)</td>
</tr>
<tr>
<td>Males</td>
<td>67 (22.6)</td>
</tr>
<tr>
<td>Age group of respondents in years</td>
<td></td>
</tr>
<tr>
<td>&lt; 25</td>
<td>7 (2.4)</td>
</tr>
<tr>
<td>25-35</td>
<td>23 (7.8)</td>
</tr>
<tr>
<td>36-45</td>
<td>47 (16.0)</td>
</tr>
<tr>
<td>46-55</td>
<td>94 (32.1)</td>
</tr>
<tr>
<td>56-66</td>
<td>76 (25.9)</td>
</tr>
<tr>
<td>&gt; 66</td>
<td>46 (15.7)</td>
</tr>
<tr>
<td>Respondents' educational level</td>
<td></td>
</tr>
<tr>
<td>No formal education</td>
<td>171 (58.4)</td>
</tr>
<tr>
<td>Primary education</td>
<td>23 (7.8)</td>
</tr>
<tr>
<td>JHS/Middle school</td>
<td>22 (7.5)</td>
</tr>
<tr>
<td>SHS/Vocational Institute</td>
<td>41 (20.8)</td>
</tr>
<tr>
<td>College/Tertiary</td>
<td>38 (13)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>13 (4.4)</td>
</tr>
<tr>
<td>Married</td>
<td>206 (70.3)</td>
</tr>
<tr>
<td>Divorced</td>
<td>9 (3.1)</td>
</tr>
<tr>
<td>Widowed</td>
<td>65 (22.2)</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>61 (20.8)</td>
</tr>
<tr>
<td>Students</td>
<td>4 (1.4)</td>
</tr>
<tr>
<td>Pensioners</td>
<td>18 (6.1)</td>
</tr>
<tr>
<td>Formal</td>
<td>41 (14)</td>
</tr>
<tr>
<td>Housewives</td>
<td>18 (6.1)</td>
</tr>
<tr>
<td>Informal</td>
<td>151 (51.5)</td>
</tr>
</tbody>
</table>

*Source: Field survey, 2014*
4.3 Medical history and its effects on diabetic respondents

Even though assigning a type of diabetes to an individual often depends on the circumstances present at the time of diagnosis, many diabetic individuals do not easily fit into a single class (ADA, 2008). However, in this survey all study units aged 35 years or less were considered to have had type 1 diabetes and those aged 36 years and above as at the time of data collection were also considered to be type 2 diabetics. Those who were diagnosed while pregnant maintained their status quo even though some may have given birth. The results revealed that 28 (9.6%) had type 1 diabetes, 12 (4.1%) had gestational diabetes while the remaining 253 (86.3%) were type 2 diabetics. As at the time of the study the findings showed that 229 (78.2%) have been living with the condition for about 1-8 years, 49 (16.7%), 7 (2.4%) and 1 (0.34%) were living with the condition for about 9-16 years, 17-24 years and 25-32 years respectively whiles 2.4% were newly diagnosed cases. Study participants gave varied perceived causes of their condition as the analysis showed that those who believed their condition was a curse were 6 (2.0%). Others were also of the view that they became diabetics by hereditary 43 (14.7%), pregnancy-induced 11 (3.7%), through witchcraft 1 (0.34%), diet related 16 (5.5%), and through medication 1 (0.34%). The vast majority 215 (73.4%) of the respondents could not tell the cause of their condition as they believed it was God given hence they cannot explain. Their perceptions covered a range of religious and environmental theories which influenced their coping mechanisms.

Of all 293 subjects enrolled in the study only 90 (30.7%) had family history of the condition whiles 183 (62.5%) did not have any form of family history of the disease. Meanwhile 20 (6.8%) could not tell us as to whether or not their families have a history of the disease. Eleven (3.8%) of the study subjects responded to having infection, 10 (3.4%). Examples of infection that they suffered from were skin infection (funga l infection) and 1 (0.34%) from foot ulcer. However, none of the respondents interviewed had tested positive to sputum smear.
(TB) as at the time of data collection. Six (2.0%) of the infections were after diagnosis, 1.0% before diagnosis and 0.7% same time as being diagnosed diabetic. On the issue of how health influence/affect their ability to access medical care, 72% of respondents stated their health does not in any way influence their ability to access medical care, 19.5% did not provide any answer, 0.7% responded sometimes and 7.8% indicated their health influence their ability to access medical care. These individuals who stated their health influence their ability to access medical care complained they spend too much time at the hospital whenever they visit, do not have money to pay for transportation to the hospital some times and therefore visits when they are not well or have less work to do. Others complained that they may not be well but since there is no one to take care of them or bring them to the hospital they will rather visit the nearest herbalist.

Analysis from the study revealed that 189 (65%) of the study subjects had other forms of chronic conditions. Of this number, 159 (54.3%) of them had only hypertension of which 95 (32.4%) developed it after they were diagnosed diabetic and 44 (15.0%) before they were diagnosed diabetic while 20 (6.8%) of them were diagnosed same time with diabetes. Of the remaining 30 (10.2%) with chronic conditions, 1% of them had both hypertension and asthma; 1% had hypertension, asthma and ulcer; 2.7% hypertension and ulcer; 3.4% ulcer only; 1.4% asthma only; 0.34% had hypertension and dyslipidaemia, and 0.34% had a heart condition. The findings suggest that the presence of diabetes pre disposes an individual to other conditions and vice versa.
Table 4: Medical history of respondents

<table>
<thead>
<tr>
<th>Variables</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diabetes Types</strong></td>
<td></td>
</tr>
<tr>
<td>Type 1 DM</td>
<td>30 (10.2)</td>
</tr>
<tr>
<td>Type 2 DM</td>
<td>251 (85.7)</td>
</tr>
<tr>
<td>Gestational diabetes</td>
<td>12 (4.1)</td>
</tr>
<tr>
<td><strong>Years of living with the condition</strong></td>
<td></td>
</tr>
<tr>
<td>1-8 years</td>
<td>229 (78.2)</td>
</tr>
<tr>
<td>9-16 years</td>
<td>49 (16.7)</td>
</tr>
<tr>
<td>17-24 years</td>
<td>7 (2.4)</td>
</tr>
<tr>
<td>25-32 years</td>
<td>1 (0.34)</td>
</tr>
<tr>
<td>Newly diagnosed</td>
<td>7 (2.4)</td>
</tr>
<tr>
<td><strong>How it was acquired</strong></td>
<td></td>
</tr>
<tr>
<td>Hereditary</td>
<td>43 (14.7)</td>
</tr>
<tr>
<td>Pregnancy induced</td>
<td>11 (3.8)</td>
</tr>
<tr>
<td>Witchcraft/medication/curse</td>
<td>8 (2.7)</td>
</tr>
<tr>
<td>God given</td>
<td>215 (73.4)</td>
</tr>
<tr>
<td>Diet related</td>
<td>16 (5.5)</td>
</tr>
<tr>
<td><strong>Co-morbidities</strong></td>
<td></td>
</tr>
<tr>
<td>Hypertension (HPTN)</td>
<td>159 (54.3)</td>
</tr>
<tr>
<td>HPTN and asthma</td>
<td>3 (1.0)</td>
</tr>
<tr>
<td>HPTN, asthma and ulcer</td>
<td>3 (1.0)</td>
</tr>
<tr>
<td>HPTN and ulcer</td>
<td>8 (2.7)</td>
</tr>
<tr>
<td>Ulcer only</td>
<td>10 (3.4)</td>
</tr>
<tr>
<td>Asthma only</td>
<td>4 (1.4)</td>
</tr>
<tr>
<td>HPTN and dyslipidaemia</td>
<td>1 (0.34)</td>
</tr>
<tr>
<td>Heart condition</td>
<td>1 (0.34)</td>
</tr>
<tr>
<td><strong>Family history of disease</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>90 (30.7)</td>
</tr>
<tr>
<td>No</td>
<td>183 (62.5)</td>
</tr>
<tr>
<td>No idea</td>
<td>20 (6.8)</td>
</tr>
</tbody>
</table>

*Source: Field survey, 2014*
4.4 Social burden of diabetes on study subjects

On assessing the prevalence of national health insurance scheme (NHIS) users, it happened that 292 respondents of them were on the scheme with only one person not having enough money to renew. A little over 70.0% had all their drugs covered by the health insurance scheme whiles 82 (28.0%) had some of their drugs not covered by the scheme but have to spend directly from their pocket or get help to buy. Even though co-payment of services and drugs are illegal because NHIS covers drugs and medical investigations in its entirety some patients complained they had to top up at the various pharmacy shops especially the private (NHIS accredited) owned to get their drugs.

Majority of those interviewed 214 (73%) agreed to their having NHIS influencing their ability to access medical care whiles 79 (26.9%) answered that it does not influence their ability to seek medical care since they will definitely visit the hospital when they are sick.

In eliciting from the respondents as to whether or not the government assists them financially in respect to the management of the condition 290 (99.0%) stated not at all. All patient respondents indicated they have never received any aid in the form of cash, food or any other since they started attending diabetic clinics, apart from the general subsidy of government on drugs. Only 38 (13.0%) of the respondents sometimes default in their routine visits to the various health facilities for their routine check-up citing reasons for their default such as business, long distance from homes to health centres and long waiting periods at the facilities before receiving care. Of all the study subjects only 22 (7.5%) had their families not encouraging them in any way in seeking medical care and in the management of their condition. However, they further added it does not deter or discourage them from seeking medical care.
4.5 Impact of diabetes on the financial situation of study subjects

The large majority 246 (84.0%) of the respondents had no idea of the cost of the glucometer strips used. This is not surprising since only 37 (12.6%) of respondents personally owned glucometers. However, 35 (11.9%) found it to be expensive for them to purchase with the rest reporting that the cost of the glucometer strips is moderately affordable. Currently, a container of 25 pieces of the glucometer strips sells between 57.86 - 63.40GHC at hospital pharmacies to 68.40- 80.60GHC at the private pharmacies depending on the type needed.

Of all the respondents interviewed those who spent at most 50GHC per month on medications were 103 (34.3%). It was also observed that 7 (2.3%) and 4 (1.3%) spent between 51-100GHC and 101-200GHC respectively on their monthly medications. Majority of the respondents were spending between 20-100GHC monthly as out-of-pocket expenses especially those on insulin. Those who were spending more than 100GHC were those buying drugs for complications that have resulted as a result of diabetes in addition to their routine drugs. They were buying medications such as Lyrica and Neuropat for numbness or tingling (pains) in fingers and the legs. Another aspect of the lives of diabetics is their visit to health care centres monthly for treatment which partly burdens them financially. Findings from the study showed that 219 (74.7%) spent a minimum of GHC2.40p on transportation whiles 12 (4.1%) and 8 (2.7%) also spent between 6-10GHC and 11-24GHC respectively.

Only 38 patients (13%) stated they have cut down on some of their medication because those were out-of-pocket expenses they could not afford, 26 patients (8.9%) could not afford drugs of prices from 10-50GHC, 6 (2%) could not afford drugs between prices of 51-100GHC and 6 (2%) patients could not afford drugs above 100GHC. Of these respondents, 5.8% of them are in the informal sector of which 2.7% do not know the amount of money they earn in a month; 3.4% are unemployed and depend on monies given to them by friends and relatives, 0.3% student and the remaining 3.4% are in the formal sector. For the 22 (7.5%) respondents
who were able to provide their income it ranged from 50 - 1,000GHC with (4.8%) of them earning not more than 300GHC in a month. Only 13.2% of the 38 respondents had no dependents. The remaining had dependents that ranged from 2 to 15 per household, an average of 4.9 dependents per patient. An indication that buttresses the perception that burden of illness is hard on those with low income and high dependents.

On the other hand, the remaining 255 respondents interviewed have not cut down on medication before. This was possible for them because NHIS covers all their drugs (60%) or they can buy all their drugs (9.8%) or because they find ways to buy all needed drugs (30.2%). Only 9.8% stated they can buy all drugs whiles the 30.2% who find ways to buy their medications are those who receive help from their children, family and other relations; an indication that the burden of the disease is borne by the family and society at large.

According to 129 (42.3%) of the respondents their condition impact negatively on their work capacity with reasons such as being too weak to work, easily become tired, feeling so dizzy and at times unable to sleep at night. In order for these diabetics to access health care during clinic days which is organized only on week days they seek support from family, relatives, friends, neighbours and sometimes from their older children as well as their own superiors at work place.

On the issue of how they schedule between work and coming to the hospital on clinic days, 32% leave work or school to attend clinic; 14% stated they had relations like their husbands, older children or close relatives who stay with them to take care of the shops; 15.4% had apprentices, colleagues or supervisors who assume their duties for them while 38.9% had no problem with scheduling because they work in the evenings, work on specific days or are unemployed.
Long waiting period at health centres has always been one of the reasons keeping people away from the formal health care setting. The results of this survey revealed that 89 (30.3%) spent at most 3 hours at health centres before receiving care whiles the rest spent over 3 hours each time they visited the hospital for treatment. Majority of the patients indicated that, at the diabetic clinics they spend at most 1 hr 30 mins at the clinics and spend the same amount of time trying to get their medications at the pharmacies of the various hospitals. Most of the patients 105 (52.2%) that complained of spending more than 3 hours when they visited were those accessing health care at the Tamale Teaching Hospital. This could be due to the fact that it is a tertiary health facility, has a high number of registered diabetics and deals with most of the referral cases from the other hospitals in the metropolis and the region.

Even though 86.7% respondents indicated their finances do not influence their ability to access medical care, 13.3% agreed their finances influence their ability to seek medical care. On the other hand, 214 (73%) of respondents answered yes to their having or not having NHIS influencing their ability to seek health care because they may not have enough money to report at the service facility monthly. These two statements are contradictory and an indication that the NHIS has reduced the financial burden most patients would have otherwise faced. Because it shows that without health insurance most respondents would not have accessed health care due to insufficient finances. Even though medications like insulin are being rationed for patients which still means those on insulin will have to buy extra to supplement their requirement for the month, out of pocket expenses is still reduced, an indication that the disease imposes some level of financial burden on it sufferers.
Table 5: Financial demands on respondents due to diabetes

<table>
<thead>
<tr>
<th>Variables</th>
<th>n (frequency and %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money spent on medication besides NHIS</td>
<td></td>
</tr>
<tr>
<td>GHC 50</td>
<td>103 (34.3)</td>
</tr>
<tr>
<td>GHC 51-100</td>
<td>7 (2.3)</td>
</tr>
<tr>
<td>GHC 101-200</td>
<td>4 (1.3)</td>
</tr>
<tr>
<td>None</td>
<td>179 (61.1)</td>
</tr>
<tr>
<td>Transportation fares to Hospital</td>
<td></td>
</tr>
<tr>
<td>GHC 2.40</td>
<td>219 (74.7)</td>
</tr>
<tr>
<td>GHC 6-10</td>
<td>12 (4.1)</td>
</tr>
<tr>
<td>GHC 11-24</td>
<td>8 (2.7)</td>
</tr>
<tr>
<td>None</td>
<td>54 (18.4)</td>
</tr>
<tr>
<td>Cut down on medication due to cost</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>38 (13.0)</td>
</tr>
<tr>
<td>No</td>
<td>255 (87.0)</td>
</tr>
<tr>
<td>NHIS influence clinic attendance</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>214 (73.1)</td>
</tr>
<tr>
<td>No</td>
<td>79 (26.9)</td>
</tr>
<tr>
<td>Scheduling between work/school and clinic</td>
<td></td>
</tr>
<tr>
<td>Leave work/school</td>
<td>93 (31.7)</td>
</tr>
<tr>
<td>Relations</td>
<td>41 (13.99)</td>
</tr>
<tr>
<td>Apprentices/Supervisors</td>
<td>45 (15.4)</td>
</tr>
<tr>
<td>No problem with scheduling</td>
<td>114 (38.9)</td>
</tr>
</tbody>
</table>

Source: field survey, 2014

4.6 Emotional/lifestyle burden of diabetes on study subjects

The emotions described by the respondents below (Table 6) are considered a normal process people go through upon being diagnosed of a disease especially a chronic condition. This explains why they should be counselled. Even though health care professionals stated all diagnosed patients are counselled, as much as 264 (85.4%) agreed they were counselled upon being diagnosed.
**Table 6: Reactions expressed by diabetics when they were first diagnosed of the condition**

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sad and worried</td>
<td>30</td>
<td>10.2</td>
</tr>
<tr>
<td>Fear, scared and frightened</td>
<td>207</td>
<td>70.7</td>
</tr>
<tr>
<td>Indifferent</td>
<td>39</td>
<td>13.3</td>
</tr>
<tr>
<td>Shocked and surprised</td>
<td>8</td>
<td>2.7</td>
</tr>
<tr>
<td>Denial</td>
<td>9</td>
<td>3.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>293</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

*Source: Field Survey, 2014*

This number is encouraging since it shows that about 85% of patients have been prepared for their new life with diabetes. Accepting the diagnosis of a chronic condition is an adjustment process that helps in the modification of lifestyle choices and influence better treatment outcomes. It is known that functional disabilities, treatment costs, dependency on others especially families, could affect psychological wellbeing in diabetic patients. The American Diabetes Association 'Standards for Medical Care' 2006 clearly states that emotional well-being is part of diabetes management, and recommends 'to incorporate psychological treatment into routine care rather than waiting for identification of a specific problem or deterioration in psychological status' (Garrusi *et al.*, 2013).

From the results it was observed that the condition has affected the lifestyle of several of the respondents. Over 20% complained of low productivity due to being weak some of the times, eating restrictions, lot of mood swings and tiredness. The interview conducted also revealed that 51 (17.4%) were reported to have had some complications arising from their condition of being diabetics. Some of the complications cited included stomach ulcers (2.7%), numbness of feet and fingers (3.1%), amputation of the toe and chronic kidney disease and heart
condition (2.7%) and blurred vision (8.9%). Other complications such as foot ulcer, extreme tiredness and headaches as well chronic stomach pains were mentioned. When participants were asked as to whether they were worried or not of their condition, a little over 50.0% reported they were worried and afraid they will develop serious complications from the disease and be a burden on their families.

From those interviewed, 18 (6.1%) reported diabetes has affected the relationship between them and their spouse/family, 2.7% of them complained of having low desire for sexual relations, 0.7% males complained of erectile dysfunction, 2.7% complained of marital disharmony/strained relations of which less than 1% stated they had to leave their homes. Of the 2.7% with low desire for sexual relations, there were an equal number of males and females aged 37-61 years all of which had hypertension. Also, 1.02% of them have poor eyesight, 0.7% had numbness of feet and 0.7% had lost two pregnancies. It is an indication that the double burden of chronic conditions coupled with its complications put stress on the individual and tend to make people feel apart from friends and families thereby affecting their relations. Of the 2.7% with marital disharmony, 1.7% of them stated their families were not supportive and have neglected them. They also complained that their condition sometimes causes disagreement/qua rrels among family members and 2.0% stated that their condition causes a general atmosphere of hostility/tension. Majority of the respondents (85.7%) had their families being so supportive to them. Of the remaining 14.3% respondents, 12.2% had their families being indifferent towards them, 1.4% stated they were being neglected and are part of those who stated their condition causes an atmosphere of hostility at home whiles the rest (0.7%) indicated their families are not aware they have diabetes.

Additionally, 6.1% of the respondents’ condition always created some form of hostility within their families. On the other hand, 4.8% respondents’ condition sometimes/always causes disagreements and quarrels within their families. Of this issue, 2% of them had their
families not being supportive, their condition causing an atmosphere of hostility at home and source of disagreements among family members. This shows an extreme source of emotional distress for these patients which do not help the outcome of treatment. Only 4.8% reported diabetes has affected the way they relate to people; these included those whose families treated them like they have infectious diseases (1.7%), (1.4%) stated food restrictions has caused strained family relations with relatives and (1.7%) however did not give any reasons.

On the issue of how the condition impact on their own lifestyle only 15.02% agreed diabetes has affected them. Of these 5.8% stated they are faced with eating restrictions since they cannot take sweets and other foods they prefer, 9.2% stated no active work and avoid social events.

As at the time of the study none of the participants were engaged in smoking or alcohol consumption. It was also observed that 5.1% and 2.4% use to take alcohol and smoke respectively while only 1.4% did both. However, more than half of them discontinued after being diagnosed diabetic or hypertensive. On the other hand, about 30% of the respondents attested to occasionally taking alcoholic beverages. Only 3.4% stated that their emotional health influenced their ability to access medical care. A little over 2% were below the age of 35 years, an indication that the emotional burden may be high in type 1 diabetics.
Table 7: Emotional burden and complications arising from diabetes

<table>
<thead>
<tr>
<th>Variables</th>
<th>n (frequency and %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complications arising from diabetes</td>
<td></td>
</tr>
<tr>
<td>Amputation of toe, kidney disease and heart condition</td>
<td>8 (2.7)</td>
</tr>
<tr>
<td>Stomach ulcers</td>
<td>8 (2.7)</td>
</tr>
<tr>
<td>Numbness of feet and fingers</td>
<td>9 (3.1)</td>
</tr>
<tr>
<td>Blurred vision</td>
<td>26 (8.9)</td>
</tr>
<tr>
<td>Strained relations due to diabetes</td>
<td></td>
</tr>
<tr>
<td>Low sexual desires</td>
<td>8 (2.7)</td>
</tr>
<tr>
<td>Erectile dysfunction</td>
<td>2 (0.7)</td>
</tr>
<tr>
<td>Marital disharmony</td>
<td>8 (2.7)</td>
</tr>
<tr>
<td>Family support</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>251 (85.7)</td>
</tr>
<tr>
<td>Indifferent</td>
<td>36 (12.2)</td>
</tr>
<tr>
<td>Neglected</td>
<td>6 (2.1)</td>
</tr>
<tr>
<td>Condition causes problems at home</td>
<td></td>
</tr>
<tr>
<td>Always causes hostility</td>
<td>18 (6.1)</td>
</tr>
<tr>
<td>Always causes quarrels</td>
<td>14 (4.8)</td>
</tr>
<tr>
<td>Condition impact on lifestyle</td>
<td></td>
</tr>
<tr>
<td>Eating restrictions</td>
<td>17 (5.8)</td>
</tr>
<tr>
<td>No active work and social events</td>
<td>27 (9.2)</td>
</tr>
</tbody>
</table>

Source: field survey, 2014

In order to estimate the psychological burden of diabetes the patient health questionnaire, PHQ 9 was administered. In the responses for nearly every day and more than half the days, only two questions PHQ3 and PHQ4 (see appendix B, Page 112) recorded highest values. In PHQ3, 7.5% and 26.6% complained of having trouble falling/staying asleep or sleeping too much nearly every day and more than half the days respectively while in PHQ4, 15.3% and 38.9% complained of feeling tired/having little energy nearly every day and more than half the days respectively.
Of all the people interviewed only, 11 (3.8%) had on several days’ thoughts that they would be better off dead/hurting themselves in some way. Of these, 2.4% had mild depression (5-9 scores), 1% had moderate depression (10-14 scores) and only 0.34% had moderately severe depression (15-19 scores). Seven (2.4%) of these respondents had depression scores below 10.

Major depression is diagnosed if five or more of the nine depressive symptom criteria have been present at least “more than half the days” in the past 2 weeks, and one of the symptoms is depressed mood. One of the nine symptom criteria (“thoughts that you would be better off dead or of hurting yourself in some way”) counts if present at all, regardless of duration. With this as a guide, 12.6% patients (this includes the 30 patients with depression scores ≥10, and seven of the 11 patients who had thoughts that they would be better off dead or of hurting themselves in some way even though their scores were below 10) exhibited depressive symptoms and needs immediate initiation of pharmacotherapy and psychotherapy to improve emotional wellbeing and influence treatment outcomes.

The depression score was highest with a score of 17 in a 21 year old female student who had ulcer and was on diet as medication. Even though the family is supportive she sometimes misses the monthly clinic visit because of family problems. Her condition she says sometimes creates an atmosphere of tension at home as well as cause disagreements amongst family members and she has on several occasions thought that she will be better off dead. This is a typical example of the psychological burden that some of the patients go through when there is not a full family acceptance and support which correlated with inconsistent adherence to treatment regimens on the part of the patient. Only 26.9% of the 189 patients with other chronic conditions had a depression score below 5, an indication that depressive disorders were associated with increased prevalence of chronic diseases. This association between depression and chronic disease appears attributable to depressive disorders precipitating
chronic disease, and to chronic disease exacerbating symptoms of depression. In comparing depression scores between the genders, the percentage score of men in (10-14 scores) was high with 11.9% while it was 9.7% in their female counterparts.

4.7 Severity of Depression among the Study Subjects

About 55.0% of all the respondents were mildly depressed suggesting the presence of depressive symptoms (Table 8). However, a little over 36.0% were not experiencing depressive symptoms as at the time of the survey. From the results no study participant was found to be severely depressed.

Table 8: Degree of depression among the study subjects

<table>
<thead>
<tr>
<th>DEPRESSION SEVERITY</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0-4) none</td>
<td>106</td>
<td>36.2</td>
</tr>
<tr>
<td>(5-9) mild</td>
<td>157</td>
<td>53.6</td>
</tr>
<tr>
<td>(10-14) moderate</td>
<td>29</td>
<td>9.9</td>
</tr>
<tr>
<td>(15-19) moderately severe</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>(20-27) severe</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>293</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field survey, 2014

4.7.1 Factors Associated With Psychosocial Burden of Depression

On assessing the associations between the socio-economic variables and degree of depression (which in this survey is defined as psychosocial burden), the following findings were observed as tabulated in Tables 9 and 10. The findings from the survey revealed that those who were not married were 2 times more likely to experience depressive symptoms as compared to the married group (OR =2.0; 95% CI: 0.9-4.2; P=0.089). This could suggest married people could have been receiving some form of social support from their partners.
and that could have accounted for their comparative advantage of being less likely to experience depressive symptoms over their single counterparts.

Table 9: Factors associated with patients’ level of depression using binary logistic regression model

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Dependent variables</th>
<th>P-values</th>
<th>Odds ratio</th>
<th>95% confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (16 - 45; 46 and above)</td>
<td>level of depression</td>
<td>0.505</td>
<td>1.3</td>
<td>0.6 - 3.0</td>
</tr>
<tr>
<td>Sex (Male; Female)</td>
<td>level of depression</td>
<td>0.575</td>
<td>0.8</td>
<td>0.3 - 1.9</td>
</tr>
<tr>
<td>Occupation (Formal sector; Informal sector)</td>
<td>level of depression</td>
<td>0.109</td>
<td>5.2</td>
<td>0.7 - 39.5</td>
</tr>
<tr>
<td>Marital status (Married; Single)</td>
<td>level of depression</td>
<td>0.089</td>
<td>2</td>
<td>0.9 - 4.2</td>
</tr>
<tr>
<td>Family history of conditions (Yes; No)</td>
<td>level of depression</td>
<td>0.612</td>
<td>1.3</td>
<td>0.5 - 2.9</td>
</tr>
<tr>
<td>No. of medications (1-3; 4 and above)</td>
<td>level of depression</td>
<td>0.09</td>
<td>0.4</td>
<td>0.2 - 1.1</td>
</tr>
<tr>
<td>Do you worry about your condition (Yes; No)</td>
<td>level of depression</td>
<td>0.132</td>
<td>0.6</td>
<td>0.3 - 1.2</td>
</tr>
<tr>
<td>Does the disease prevent you from doing certain things you like (Yes; No)</td>
<td>level of depression</td>
<td>0.012</td>
<td>0.2</td>
<td>0.0 - 0.7</td>
</tr>
</tbody>
</table>

Source: Field survey, 2014

NB: The second category for each independent variable is the reference category

4.7.2 Predictors of psychosocial burden of diabetic patients based on binary logistics regression

Analyses of predictors of depression of all the factors modelled after controlling for confounding factors are as shown in Table 10 below. The independent variables were simultaneously introduced into the model in order to control for the effects of the other variables. Individuals employed in the informal sector were 17 times more likely to be burdened by depressive symptoms compared with their colleagues employed in the formal sector.
The study also revealed that those who did not know how they got the disease were 8 times more likely to be burdened by depressive symptoms compared with those who knew how they got the condition (aOR=8.0; 95%CI: 1.9-32.8; P=0.004). The modelling also showed that respondents without family history of diabetes were 4.5 times more likely of experiencing depressive symptoms than those with family history of diabetes (aOR=4.5; 95%CI: 1.0-20.1; P=0.049). Though the analysis could not support any significant association of respondents' age and psychosocial burden of the condition after having controlled for confounding factors, the results still suggest that those within the age bracket of 46 years had a higher probability to be burdened by depressive symptoms of the condition than those within the 16-45 years.

Table 10: Predictors of psychosocial burden of diabetic patients

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Dependent variables</th>
<th>P-values</th>
<th>Adjusted odds ratio (aOR)</th>
<th>95% confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (16-45; 46 and above)</td>
<td>Level of depression</td>
<td>0.744</td>
<td>0.8</td>
<td>0.3 - 2.7</td>
</tr>
<tr>
<td>Sex (male; female)</td>
<td>Level of depression</td>
<td>0.236</td>
<td>0.5</td>
<td>0.1 - 1.6</td>
</tr>
<tr>
<td>Occupation (formal sector; informal sector)</td>
<td>Level of depression</td>
<td>0.017</td>
<td>17</td>
<td>1.7 - 177.6</td>
</tr>
<tr>
<td>Education (at most primary, JHS and above)</td>
<td>Level of depression</td>
<td>0.168</td>
<td>2.2</td>
<td>0.7 - 7</td>
</tr>
<tr>
<td>Marital status (married; single)</td>
<td>Level of depression</td>
<td>0.095</td>
<td>2.4</td>
<td>0.9 - 67.0</td>
</tr>
<tr>
<td>Duration of conditions (1-10; above 1yrs)</td>
<td>Level of depression</td>
<td>0.167</td>
<td>4.9</td>
<td>0.5 - 47.2</td>
</tr>
<tr>
<td>How do you think you got the condition? Know the source/don't know</td>
<td>Level of depression</td>
<td>0.004</td>
<td>8</td>
<td>1.9 - 32.8</td>
</tr>
<tr>
<td>Family history of conditions (Yes; No)</td>
<td>Level of depression</td>
<td>0.049</td>
<td>4.5</td>
<td>1.0 - 20.1</td>
</tr>
<tr>
<td>Measures taken (Yes; No)</td>
<td>Level of depression</td>
<td>0.382</td>
<td>2.5</td>
<td>0.3 - 19.5</td>
</tr>
<tr>
<td>Are all your drugs covered by the insurance? (Yes; No)</td>
<td>Level of depression</td>
<td>0.292</td>
<td>1.9</td>
<td>0.7 - 3.6</td>
</tr>
</tbody>
</table>

Source: field survey, 2014

NB: The second category for each independent variable is the reference category
4.7.3 Factors associated with patients’ accessibility to health care based on binary logistic regression model.

The results summary in this section covers the statistical relationships between socioeconomic variables and respondents’ health accessibility. The findings suggest that those who were 46 years and above were less likely to default in their attendance to diabetic clinics for the purpose of accessing health care (aOR=0.5; 95% CI: 0.3-1.1; P=0.079). Those who did not know how they got the disease showed that they were less likely to default in their clinic attendance as compared to those who agreed that they knew how they got the condition (OR=0.4; 95% CI: 0.2-0.7; P=0.005).

Table 11: Factors associated with patients’ accessibility to health care analysed using binary logistic regression model

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Dependent variables</th>
<th>P-values</th>
<th>Odds ratio</th>
<th>95% confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (16 - 45; 46 and above)</td>
<td>diabetic clinic</td>
<td>0.079</td>
<td>0.5</td>
<td>0.3 - 1.1</td>
</tr>
<tr>
<td>Sex (male; female)</td>
<td>diabetic clinic</td>
<td>0.15</td>
<td>0.6</td>
<td>0.3 - 1.2</td>
</tr>
<tr>
<td>Occupation (formal sector; informal sector)</td>
<td>diabetic clinic</td>
<td>0.075</td>
<td>2.1</td>
<td>0.9 - 5.0</td>
</tr>
<tr>
<td>Education (at most primary; JHS and above)</td>
<td>diabetic clinic</td>
<td>0.052</td>
<td>0.5</td>
<td>0.2 - 1.0</td>
</tr>
<tr>
<td>Marital status (married; single)</td>
<td>diabetic clinic</td>
<td>0.891</td>
<td>1.1</td>
<td>0.5 - 2.2</td>
</tr>
<tr>
<td>Duration of conditions (1-10; above 10 yrs)</td>
<td>diabetic clinic</td>
<td>0.7</td>
<td>1.2</td>
<td>0.4 - 3.8</td>
</tr>
<tr>
<td>How do you think you got the condition? (know the source; don’t know)</td>
<td>diabetic clinic</td>
<td>0.005</td>
<td>0.4</td>
<td>0.2 - 0.7</td>
</tr>
<tr>
<td>Do you have a glucometer? (Yes; no)</td>
<td>diabetic clinic</td>
<td>0.0001</td>
<td>4.2</td>
<td>1.9 - 9.4</td>
</tr>
<tr>
<td>Have you ever cut down on medication use due to cost? (yes; no)</td>
<td>diabetic clinic</td>
<td>0.122</td>
<td>2</td>
<td>0.8 - 4.7</td>
</tr>
</tbody>
</table>

Source: field survey, 2014

NB: The second category for each independent variable is the reference category
4.8 Coping Mechanisms Adopted by Diabetics

In assessing patients' view on coping strategies and self-care management, two hundred and eighty (95.6%) believe they will get better whiles the remaining think otherwise because there is no cure. Of all the respondents, only 33.1% had specific coping mechanisms which were: traditional medicine/spiritual assistance sought by 14.7%; 5.8% used local herbs (like dandelion, moringa); exercises and dieting, 2.7%; prayers, 8.5% and both prayers and traditional medicine 1.4%. Two hundred and seventy-four respondents (93.5%) believed in prayers and that things including diabetes come from God, whiles 6.5% think prayers have got little to do with diabetes. Their belief in how they got the disease thus explains how they coped with it since 215 (73.4%) patients acknowledged it was God/Allah given, thus the person who can better to cure them was God/Allah himself. Over 90% (215, 95%) believed in prayers and that religious gathering was helpful for them since they get support from friends.

Sixty-five (22.2%) stated health workers attitude was encouraging while 73.4% indicated their attitude is good. Only 4.44% of patients' respondents reported bad/indifferent attitude of staff with majority receiving service at the Central Hospital; this may suggest that there may be some unmet needs of the patients at this facility.

Of the respondents, 62.5% agree the attitudes of the staff do not influence their clinic attendance since health is more important, 32.1% stated staff attitude influence their attendance whiles 5.5% stated staff attitude somehow and sometimes influenced their attendance. However, more than half 285 (97.3%) believe following the instructions of the health worker will improve their medical condition. In response to whether or not their religious organization showed support to/for members suffering from some form of ailment in the form of visiting them, praying for them, providing cash and material things when needed/when they have the means 53 (18.1%), 8 (2.7%) and 232 (79.2%) answered yes, sometimes and no respectively.
All respondents stated they do not belong to any social group that identifies them as being diabetic. In trying to elicit from the respondents what measures they have taken 277 (94.5%) did not take any personal precautionary measures to prevent or reduce their risk of getting diabetes whilsts 16 (5.5%) made a few lifestyle changes in their attempt to prevent or reduce their chances of getting diabetes. From their responses, limiting sugar intake was the top most effort taken by 12 (4.1%) participants; 3 (1%) were involved in physical exercises while 1 (0.34%) limited carbohydrate rich foods intake. Majority of the patients interviewed followed their medications religiously but failed to modify their lifestyle for better treatment outcomes.

Majority, about 280 (95.6%) were engaged in monitoring their blood glucose level for at least once every month using the glucometers available at the diabetic clinics. They further report at the laboratories to check their glucose levels again with lipid profile when the glucometer readings are high or when other laboratory requests are involved. Far more than half of the respondents, 93.9% were also using both glucometer and laboratory tests and 15 (5.1%) had reported of depending on only laboratory tests for the monitoring of their blood glucose level. Additionally 7 (2.4%) were monitoring their blood glucose level every week, 5 (1.7%) quarterly and 1 (0.3%) every 3 days accordingly. On the other hand, 30% of those interviewed who did not own glucometers stated they visited the pharmacy shops two weeks interval to check their glucose level at a cost of 4-5GHC per test.

The results showed that only 37 (12.6%) of the respondents owned a glucometer each. Of those interviewed that owned personal glucometers 18 (48.6%) complained that the strips are expensive 7 (18.9%) said the strips are either affordable or moderately affordable whiles 12 (32.4%) stated they had no idea of the test strip prices since their glucometers are new and are yet to finish their strips. More than 40% of those interviewed did not own glucometers. While 2.04% of the respondents were saving to buy, over 23.9% of them did not see why it was...
important to own one thereby undermining the importance of self-management. The number of medications reported by participants ranged from 0-3 types excluding dieting. Ninety-four (32.1%) reported using insulin either as a monotherapy or in a combination with other oral medications for diabetes management.
Table 12: Coping mechanisms and precautionary measures adopted

<table>
<thead>
<tr>
<th>Variables</th>
<th>n (frequency and %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How diabetes was acquired</td>
<td></td>
</tr>
<tr>
<td>God given</td>
<td>215 (73.4)</td>
</tr>
<tr>
<td>Curse/medication/witchcraft</td>
<td>8 (2.7)</td>
</tr>
<tr>
<td>Pregnancy induced</td>
<td>11 (3.7)</td>
</tr>
<tr>
<td>Hereditary</td>
<td>43 (14.7)</td>
</tr>
<tr>
<td>Diet related</td>
<td>16 (5.5)</td>
</tr>
<tr>
<td>How they coped with it</td>
<td></td>
</tr>
<tr>
<td>Religious coping</td>
<td>274 (93.5)</td>
</tr>
<tr>
<td>Traditional medicine/spiritual assistance</td>
<td>43 (14.7)</td>
</tr>
<tr>
<td>Local herbs</td>
<td>17 (5.8)</td>
</tr>
<tr>
<td>Exercises and dieting</td>
<td>8 (2.7)</td>
</tr>
<tr>
<td>Prayers only</td>
<td>25 (8.5)</td>
</tr>
<tr>
<td>Prayers and traditional medicine</td>
<td>4 (1.4)</td>
</tr>
<tr>
<td>Precautionary measures</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>277 (94.5)</td>
</tr>
<tr>
<td>Yes</td>
<td>16 (5.5)</td>
</tr>
<tr>
<td>Medications</td>
<td></td>
</tr>
<tr>
<td>Insulin</td>
<td>94 (32.1)</td>
</tr>
<tr>
<td>1 medication</td>
<td>68 (23.2)</td>
</tr>
<tr>
<td>2 or more medications</td>
<td>187 (63.8)</td>
</tr>
<tr>
<td>Attitudes of HCPs influence clinic attendance</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>183 (62.5)</td>
</tr>
<tr>
<td>Yes</td>
<td>94 (32.1)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>16 (5.5)</td>
</tr>
<tr>
<td>Receive help from religious organization</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>53 (18.1)</td>
</tr>
<tr>
<td>No</td>
<td>232 (79.2)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>8 (2.7)</td>
</tr>
</tbody>
</table>

*Source: field survey, 2014*
5.0 DISCUSSION

5.1 Introduction
This chapter discusses the main findings of the study and relates them to the appropriate literature. The main aim of the study is to determine the psychosocial burden faced by people living with diabetes. This study explores diabetes impact on the physical, financial, emotional and social aspects on the lives of people with diabetes and the coping strategies adopted for the management of diabetes. The aim of medical care in chronic disease such as diabetes is not only physical treatment, but also to ameliorate the quality of life and decrease of mental health consequences (Garrusi et al., 2013). Diabetes is a significant psychosocial burden for many individuals and this is examined in the variables below.

5.2 Depressive symptoms
Age, education, literacy, occupation and income have strong influence on the psychosocial burden of diabetes. Education has from long ago been considered as the strongest health predictor because poor levels of health may adversely impact educational attainment and consequent levels of future income (WHO, 2009).

Younger patients with high educational status and a good income had better outcomes than older patients with little/no education and low income. Some studies such as Kaholokula et al., 2003; Chou and Chi, 2005; Sweileh et al., 2014; found depressive symptoms to be high among individuals with low educational attainment, females, people with disrupted marital status and people with low levels of support; and indicate that these are the main predictors of psychosocial burden. Other studies such as Miyaoka et al., 1997; Rahman et al., 2011 found these variables to have no statistical significant to/on psychosocial burden. The studies questions whether these factors affect depressive symptoms in diabetic patients; and suggests
that whether patients are employed or unemployed may be associated with both social supports and economic status and depressive symptoms correlates with inadequate social support. It, however, states that economic status relates to the severity of a depressive state and determines the quality of life hence social class is a predictor of depressive symptoms (Miyaoka et al., 1997; Rameswarapu et al., 2011). Available evidence from developed countries indicates that the burden of chronic diseases and their risk factors are predominantly concentrated among the economically poor because the poor appear to be disproportionately burdened with the risk factors associated with these diseases (Rameswarapu et al., 2011).

In this current study, all 7.5% respondents who complained of poor family support had either strained family relations/marital disharmony (among the married) which may account for their high depressive scores. It may also explain the subsequent complications that may arise. Miyaoka et al., (1997) states it is possible that the depressive state itself may be a contributing cause of the patient's deteriorating relationship with family and friends and devaluation of the availability of social support. Adequate supports are expected to prevent diabetic patients from becoming depressed. Garrusi et al., (2013) buttress this point by stating that one of the psychosocial factors that may be considered in diabetic patients’ wellbeing is supportive environment that could help promote better metabolic management, therapeutic adherence and better quality of life. One important aspect of social support is family support.

Individuals in formal employment had better depressive scores than those in the informal sector and after been adjusted for confounders those in the informal sector were 17 times more likely to be burdened by depressive symptoms compared with those in the formal sector (aOR=17.0; 95% CI: 1.7-177.6; P=0.017). This could be accounted for by the fact that most people in the formal sector have better working conditions and are assured of regular income at the end of the month as compared with those in the informal sector.
From the analysis, older respondents (>46 years) had an increased likelihood of being depressed as compared to those aged 16-46 years. This observation varies slightly with one study that found major depressive disorder was more common in 31-59 year old group (Larijani et al., 2004); whiles Rahman et al., 2011 observed that 40-49 years age group suffered most from severe depression, though 60 – 69 years group had highest percentages of overall depressive symptoms. The physical and psychosocial changes associated with aging may affect both diabetes and depression control because elderly diabetic patients often have multiple medical conditions (physical disabilities, mental and emotional well-being) that complicate the illness (Trief, 2007). The findings from the current survey also revealed that those who were not married were twice more likely to experience depressive symptoms as compared to the married group (OR =2.0; 95% CI: 0.9-4.2; P=0.089). This finding is consistent with Connell et al., 1994; Miyaoka et al., 1997; Egede et al., 2002; Rahman et al., 2011 where it suggests that married patients can easily get support from spouse when adverse life events happens and depression levels are high in patients with poor social support. The study also show females were less depressive compared with their male counterparts contrary to other studies (Ali et al., 2006; Asghar et al., 2007; Rahman et al., 2011).

Those who depended on insulin as at the time of the study were more likely to experience depressive symptoms as compared to those who were not on insulin in this survey. Noh et al., (2005); Rahman et al., (2011) all found depression symptoms to be higher among insulin users where patients viewed oral treatment as the least and insulin as burdensome treatment and is associated with poor glycaemic control; insulin is seen as an obvious marker for more advanced diabetes and a direct reflection of diabetes severity (Aikens et al., 2008). Rahman et al., (2011) also found depression symptoms to be as high as 6 times compared with those on oral anti-diabetic agents (OR=6.33; 95% CI: 1.75- 22.89).
From the results 30.7% had family history of the disease whiles only 14.7% stated their diabetes was inherited. It has been well established that both age (as a social structural factor) and family history of diabetes (as a genetic/shared environment factor) are risk factors for developing the condition. Whilst neither of these factors can be altered by an individual, early knowledge may help prevent or at least delay the onset of diabetes. This could also have benefits when looking at in the long term, if the condition could be prevented in one generation, providing a lessening of risk in their offspring (Grant et al., 2009).

The odds of those without family history of the disease were more than those with family history (OR =1.3; 95% CI: 0.5-2.9; P=0.612) and after been adjusted for confounders were 4.5 times more likely to experience depressive symptoms which could be explained as the psychological stress brought on by the fear of the unknown and possible complications associated with the disease (aOR=4.5; 95%CI: 1.0-20.1; P= 0.049). Respondents who did not know how they got the disease were 8 times more likely to be burdened by depressive symptoms compared with those who knew how they got the condition (aOR=8.0; 95%CI: 1.9-32.8; P=0.004) after controlling for confounding factors. This could be explained by the closure brought on by being able to attribute a specific cause to the disease without which, one will be wondering how they got the disease. Not knowing the source of a disease keeps patients wondering and attributing different reasons and/or associations with a particular disease which may increase psychological stress.

Even though over 50% of respondents showed depressive symptoms, the prevalence of major depression (defined as respondents who had depressive scores greater than 10 and anyone who had thoughts they will be better off dead irrespective of their scores) among the diabetic population was 12.6%, and these were those who were in immediate need of pharmacotherapy and psychotherapy. This finding is in agreement with other studies that found the rate of depressive symptoms among diabetic population to range from 3.8% - 27.3% (Anderson et al.,...
Other studies reported a prevalence rate of 5.4% (Zahid et al., 2008); 8% (Lloyd et al., 2000); 32.4% (Bailey, 1996) and 41.3% (Rubin et al., 1987). Chou and Chi (2005) reported 12% physician diagnosed diabetes and 26% elated level of depressive symptoms among elderly Chinese diabetics. One possible reason for the differences in the prevalence of depression among diabetic patients reported by different studies is the use of different scales used to screen for depressive symptoms. Some studies used the PHQ-8, others used Ham-D or BDI II scales (Sweileh et al., 2014).

Depression scores were equally higher in patients with comorbid chronic illnesses; they were more likely to exhibit depressive symptoms than those without any other chronic conditions which may be due to the high burden of different treatment regimens and stress that comes with managing multiple chronic disease. Engum et al., (2005) found depressive symptoms to be high in type 2 DM patients with comorbid chronic disease but not in type 1 DM patients. Having multiple chronic diseases in addition to diabetes has a high impact on well-being, quality of life and functioning and thus may contribute to further development of depression (Roy et al., 2012). This finding is also consistent with respondents who had complications arising from diabetes and is supported by studies of Robinson et al., (1988); Roy et al., (2012).

Of all the respondents interviewed 42.3% complained diabetes impacted negatively on their work capacities as individuals. These individuals were more likely to exhibit depressive symptoms compared with those who stated the disease had no impact on their work capacities. This finding is consistent with (Kaholokula et al., 2003) where it states that comorbid depression in people with diabetes mellitus is associated with functional disability, low work productivity, and low health service use.
Respondents who agreed the disease does not prevent them from doing certain things they like/prefer were less likely to show depressive symptoms (OR=0.2; 95% CI 0.0-0.7; P=0.012), meaning that these respondents have no problem living their lives the way they want to irrespective of the presence of the disease.

5.3 Diabetic clinic attendance

Overall, only 13% of respondents defaulted in attending their routine monthly check up stating long waiting periods and loss of income among others as reasons. The analysis showed that those who were 46 years and above were less likely to miss their routine clinic attendance and being female was an added advantage since they were equally less likely to default. Patients agreed it is a place they meet people with similar situations thereby creating a sense of belonging for them and the only times they meet each other is at the diabetic clinics.

Respondents in the informal sector were 2 times more likely to default clinic attendance than those in the formal sector (OR=2.1; 95% CI 0.9-5.0; P=0.075). This may be due to the fact that those in the formal sector had fixed salaries that are paid to them whether or not they report to work compared to those in the informal sector who had to work to pay themselves. The studies revealed that those who were not married (single, divorced and widowed) were more likely to default in clinic attendance than those who were, which may be explained by the lack of the necessary social support they need to keep going. Individuals with education equal to Junior high school and above were less likely to default in their clinic attendance (OR=0.5; 95% CI=0.2-1.0; P=0.052). Education is known to have a strong impact on health where knowledge obtained influences an individual’s ability to access and use health care services that prevent and treat diseases. Low educational levels are linked with poor health, more stress and lower self-confidence (WHO, 2009). It is therefore well-known that individuals with higher levels of education are healthier than individuals with lower levels of education (Fletcher and Frisvold, 2009).
Over 30% of respondents stated the attitude of the health worker influence their clinic attendance, hence their clinic attendance is dependent on attitude and reception received whenever they visit for routine check-up. They complained of inadequate communication and negative attitudes of health care providers who behave more like providing favours than providing services. An indication that the role and attitude of health workers should not be under rated since it has the potential of influencing a patient willingness to attend clinic or take medications.

The analysis revealed that those who had been with the disease for 10 years and above were more likely to default in clinic attendance than those who had been with it for less than 10 years, an indication that they have grown accustomed to living the disease. It also showed that those without family history of the disease were almost 2 times more likely to default than those with family history of the condition. Respondents who agreed they took measures to delay/prevent the onset of diabetes were less likely to default so were respondents who were on insulin. These were, however, not statistically significant. Respondents with comorbid diseases were less likely to default in clinic attendance. Those who agreed not all their drugs were covered by NHIS were almost 2 times more likely to default in their clinic attendance. This may be due to insufficient money to take care of all their expenses (transportation, drugs, food etc) whenever they visit and suggests that generally health insurance does improve access to health care by reducing the financial barriers associated with utilisation of health services and is consistent with results reported by Chomi et al., 2014.

Also respondents who lacked the necessary family support to seek health care were twice more likely to default in their clinic attendance. A study conducted in Iran (Rad et al., 2013) demonstrated that lack of social and family support was among the obstacles for observing the
diet, as mentioned by the patients. Another study that used the developed health belief pattern, found that adherence to the self-care recommendations had a relationship with social support (Rad et al., 2013). The affective support, trust, sympathy and attention that patients receive from friends, family and other people encourage them to adopt healthy lifestyles and the absence of it affect treatment outcomes negatively (Rad et al., 2013). There is also evidence that the inclusion of a family member in psychosocial interventions for chronic illnesses like diabetes may improve outcomes (Kadirvelu and Sivalal Sadasivan, 2012).

Respondents who did not personally own glucometers were 4 times more likely to default in clinic attendance compared with those who did (OR=4.2; 95% CI=1.9-9.4; P= 0.0001). Individuals who own glucometers are able to self-monitor their blood glucose levels frequently compared to those who do not hence they might be anxious to visit the clinic especially if they know their blood glucose level is high. This shows the importance and commitment in keeping themselves healthy. The very possession of glucometers by respondents equally shows their commitment and the importance they attach to keeping themselves healthy.

Likewise respondents who did not know how they got the disease were less likely to default in clinic attendance (OR=0.4; 95%CI=-0.2-0.7; P=0.005). Their lack of knowledge about how they contracted the disease creates fear about their perceived susceptibility to diabetes and may influence how they process health information and therefore motivates them to engage in a particular behaviour that may help manage the disease. This then suggest that the particular behaviour they engage in is regular clinic attendance since these individuals may attribute their current well-being to regular clinic attendance.
5.4 Coping mechanism

A study involving interviews of 109 Latinos (89.5% female) living in the US with musculoskeletal disease found that 38.1% of patients used religion to help them cope with their illness (Niu et al., 2011). Furthermore, in 2008, Kirmayer et al. described how religion can imbue transcendent meaning to the pain experience (Niu et al., 2011). Again Samuel-Hodge et al., (2000) stated spirituality/religiosity was a main theme in it focus groups where participants reported that God plays a central role in providing the strength to deal with daily challenges, including those associated with diabetes. Their spirituality was seen as a source of emotional support, a positive influence on health, and contributing to life satisfaction in living and coping with diabetes. The findings of this study are consistent with the current study.

Over 90% (93.5%) of patient respondents interviewed believed in religious coping and believed that they are better off because of the prayers else their disease would have been worse. They believe God knows best and He alone understands their circumstances. The patients agree that support from religious organizations they belong to or any group that identifies them, will help create a form of security that they are not alone, which buttress the point that social support groups are vital for chronic disease management.

Patients had a variety of social, spiritual and environmental perceptions of how they had the disease. Those who believed they had the disease from sugar intake and late night eating, stopped/reduced their sugar intake and exercised as well while those who believed it was a curse sought spiritual assistance. This shows that patients have variety of ways of dealing with their disease because of their perception of how they contracted it.

A little above 60% were on at least two different medications to help with the management and control of the diabetes. In adding the number of medications those with other chronic conditions will have to take daily, these patients are under extreme pressure to cope with the
workload of treatment the diseases comes with. This includes taking the right dose of insulin, oral medication, diet, exercise etc. at the right time and regularly, considering the fact that medications for chronic conditions such as diabetes, heart conditions and hypertension are taken for life.

Only 5.5% of patient respondents did take any precaution to prevent/reduce their likelihood of developing diabetes. However, the majority of the patients stated it never occurred to them to take precautionary measures since they did not think they getting diabetes was a possibility. This explains our perception to the development of diseases where majority of people know their lifestyles are associated with different forms of diseases, both communicable and non-communicable yet makes no attempt to modify it. Even though they were aware of people in the family having it they did not think it was anything serious to worry themselves about since they had not developed it yet hence their inability or resistance to take specific measures to reduce their risk of developing diabetes. Of the measures taken to reduce/prevent the possibility of developing diabetes, reducing sugar intake (4.1%) was the highest response because in the Ghanaian culture, diabetes is believed to be caused by excessive sugar, earning it the name “esikyire yaria” meaning sugar disease in twi language and further explains why patients reduced the intake of “sweets”.

Some of these patients did not see the importance of trying to self-monitor their glucose level because they come to the hospital every month for their medication and this supports de Alva, (1997) claims that people with diabetes often have no real motivation to adopt a lifestyle that will avert blindness, kidney failure, or the need for limb amputations. Even when people with diabetes are aware of the potential for long-term complications, the chances of "that" happening to "them" are frequently thought to be non-existent.
Financial difficulty was the reason 42.3% patients did not have personal glucometers which was not surprising because 132 (45.1%) of them earned below 300GHC a month. Glucometers are portable devices manufactured to help patients self-monitor their blood glucose level regularly thereby helping them detect complications early. Most glucometers on the market are easy to use and readily display results on the screen. Unlike some developed countries where most insurance companies cover the cost of glucometers and test strips when acquired through doctor’s prescription this is not the issue in the country, this is an out of pocket expenditure most people are not willing to commit to. Currently glucometers are selling at a price of 188-250GHC and comes along with 10pieces of glucometer strips.
CHAPTER SIX

6.0 CONCLUSION/RECOMMENDATION

6.1 Conclusion

The main objective of the study is to assess socio-economic factors contributing to the psychosocial burden of diabetics, to determine the effects of socio-economic factors on the accessibility of medical care and to assess coping strategies adopted by diabetics.

This study identified that psychosocial burden is dependent on the socioeconomic variables that influence the quality of life of diabetics. Even though all patients experienced psychosocial burden as a result of the disease, the impact of the burden was more pronounced in those in the informal sector, have no personal glucometers, poor working conditions/environment, treatment regimens of insulin, complications of diabetes and poor social support.

The finding of this study therefore agrees with the alternative hypothesis that the psychosocial burden of diabetes impact negatively on the lives of sufferers.

6.2 Recommendation

To the Ministry of Health/Ghana Health Service

• Screening for depressive symptoms among diabetic patients should be part of routine health care plans for diabetics.

To the Municipal/District Health Directorate

• Educational programmes should be organized to sensitize staff on positive behavioral attitudes towards clients.

• Intensify education aimed at increasing family involvement in the management of disease burden.
• Religious organizations should be educated to encourage sufferers to seek needed medical attention.

• Provide aid in the form of the basic supplement needed by diabetics to make life easier and encourage them to seek medical care routinely, provide and sustain public education on how to support relatives living with chronic conditions.

6.3 Limitations of Study

Respondents interviewed included both patients with type 1 and type 2 diabetes mellitus which could accounts for the differences noticed. The researcher had to rely on self-report from patients to gather information about diabetes and the presence of diabetes related complications. It is important to state that depression screening measures provide an estimation of the severity of depressive symptoms and assess the severity within a specific period of time but they do not diagnose depression. However, those who score high in depression measure scales need to be interviewed and assessed for a confirmation of depression. A simple well validated and brief diagnostic tool like the PHQ 9 instead of a gold standard psychiatric diagnostic interview was used due to time constraints and lack of resources.
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APPENDIX A: Interview guide for patients' respondents

UNIVERSITY FOR DEVELOPMENT STUDIES
GRADUATE SCHOOL
SCHOOL OF MEDICINE AND HEALTH SCIENCES
DEPARTMENT OF ALLIED HEALTH SCIENCES

PSYCHOSOCIAL BURDEN OF DIABETES MELLITUS IN THE TAMALE METROPOLIS

I am Woode Emma Brown, a student of the University for Development Studies. This questionnaire is designed to obtain information from diabetic patients to help determine and assess the psychosocial burden of diabetes mellitus in the Tamale metropolis. All information obtained is strictly confidential and purely for academic purposes. The data obtained is to assist in completing my thesis as a partial fulfilment for the master's program. As all information or data are anonymous, you must understand that you will not be able to recall your content, as your information will not be traceable.

Do I have your consent to interview?  A. YES  B. NO

This questionnaire will be administered to and completed by patients.

Questionnaire no: ..........  Date: / /
Health facility: ..........

PART I

SOCIO-DEMOGRAPHIC
Age:  A. < 25year  B. 25-35 years  C. 36-45years  D. 46-55years  E. 56-66years  F. >66years

Sex: Male/ Female

1. What do you do for a living? .................................................................

2. Where do you live? .......................................................................

3. What is your level of education?
   a. No education
   b. Basic
   c. JHS
   d. SHS
   e. Tertiary

4. Number of dependents? ........
5. Marital Status
   a. Single
   b. Married
   c. Divorced
   d. Widowed
   e. Others

6. How much do you earn in a month?
   a. < 300GHC
   b. 300-500GHC
   c. 501-700GHC
   d. 701GHC+

MEDICAL HISTORY OF DIABETICS
7. At what age were you diagnosed as diabetic?
   a. < 20 years
   b. 21-30 years
   c. 31-40 years
   d. 41-50 years
   e. > 50 years

8. How do you think you got the condition?

9. Do you have a history of diabetes in your family? A. YES B. NO

10. Did you take any precautionary measures to prevent or reduce your risk of getting diabetes?
    A. YES B. NO
    a. If YES, what measures did you take?
       ..................................................................................................................
       ..................................................................................................................
       ..................................................................................................................
    b. If NO, why?
       ..................................................................................................................
       ..................................................................................................................
       ..................................................................................................................

11. How often do you monitor your blood glucose level?
    a. Weekly
    b. Monthly
    c. Quarterly
    d. Any other

12. How do you check your glucose level?
    a. Glucometer
    b. Laboratory
    c. Glucometer & Laboratory
d. Any other ........................................
13. Do you have a glucometer?  A. YES  B. NO
   a. If YES, which type? .................................................................
   b. If NO, why? ............................................................................
14. Are you insulin dependent?  A. YES  B. NO
15. How many medications are you on? .................
   a. Name them ............................................................................
16. Do you have any other known medical condition(s) eg. Hypertension, asthma, stomach ulcer?  A. YES B. NO
   a. If YES, what is/are this condition(s)? ........................................
17. Was this medical condition identified before or after you were diagnosed diabetic?
   .................................................................................................
   a. How long before or after? ............................................................
18. Have you being diagnosed as being sputum smear positive (tuberculosis) or any infection eg. Skin infection, foot ulcer?  A. YES B. NO
   a. If YES, was it before or after you were diagnosed as diabetic? .........................
   b. If YES, please state infection (apart from TB)........................................
19. How does your health affect/ influence your ability to access medical care?
   ....................................................................................................

SOCIAL BURDEN OF DIABETES

20. Do you have health insurance?  A. YES  B. NO
    a. If NO, why? ............................................................................
21. Are all your drugs covered by the insurance? A. YES  B. NO
    a. If NO, which drug is not covered, how much and how often do you take it?
    .................................................................................................
    .................................................................................................
22. Does your having or not having NHIS influence your ability to seek health care?  A. YES  B. NO
23. Do you receive any allowance/aid by the Government or private institution?  
   A. YES  B. NO

24. Do you often default in attending clinic for your routine drugs? A. YES  B. NO
   a. If YES, why? .................................................................

25. Does your family encourage you to seek health care? A. YES  B. NO
   a. If NO, how does their lack of support influence your ability to seek health care?

FINANCIAL BURDEN OF DIABETES

26. How costly are the glucometer strips?
   a. Affordable
   b. Moderately affordable
   c. Expensive
   d. Extremely expensive
   e. No idea

27. How much do you spend on medications each month besides NHIS?
   a. <50GHC
   b. 100GHC – 200GHC
   c. 201GHC- 300GHC
   d. 301GHC+

28. How much do you spend on transportation to the hospital?
   a. Nothing (walking distance)
   b. GH¢ <2.00
   c. GH¢ 2-5
   d. GH¢ >5
   e. Other GH¢ ......................

29. Have you ever cut down on medication use due to cost? A. YES  B. NO
   a. If YES, how much? .................................................................
   b. If NO, why? .................................................................

30. Does your condition have any impact on your occupation? A. YES  B. NO
   a. If YES, how? .................................................................

31. How do you schedule between work and coming to the hospital on clinic days?
   ........................................................................................................
   a. How much time do you spend at the hospital whenever you visit, from picking of folder to receiving of drugs?
      a. 1 hour
b. 1 hour 30 minutes to 2 hours
  c. 2 hours 30 minutes to 3 hours
  d. More than 3 hours
32. Do your finances influence/affect your ability to assess medical care? A. YES B. NO
  a. If YES, how? ........................................................................................................

EMOTIONAL / LIFESTYLE BURDEN OF DIABETES

33. What were your first thought when you were diagnosed diabetic?
   a. Denial
   b. Fear
   c. Shame
   d. Guilt
   e. Others .........................
34. Were you counselled by trained personnel when you were diagnosed diabetic?
   A. YES B. NO
35. How has diabetes affected your lifestyle? ........................................................................
36. Has there been any complication(s) resulting from the diabetes? A. YES B. NO
   a. If YES, which? ................................................................................................................
37. Do you worry about your condition? A. YES B. NO
   a. If YES, how? ....................................................................................................................
   b. If NO, why is the case? ........................................................................................................
38. Has your condition changed/affected the relationship between you and your family?
   A. YES B. NO
   a. If YES, how? ....................................................................................................................
39. How does your spouse/family react to your condition?
   a. Supportive
   b. Neglect
   c. Indifferent
   d. Others ..............................
40. Is your condition causing a general atmosphere of hostility or tension at home?
   a. Never occurred
   b. Occurred sometimes
   c. Always/ frequently occurs
41. Is your condition or care causing disagreements or quarrels amongst family members?
   a. Never occurred
b. Occurred sometimes

c. Always/ frequently occurs

42. Does the disease affect the way you relate to others? A. YES B. NO
a. If YES, how? ..........................................................................................................................

..........................................................................................................................
b. If NO, why is the case? ...........................................................................................................

43. Does the disease prevent you from doing certain things you like? A. YES B. NO
a. If YES, how and what? ...........................................................................................................

44. Do you take alcohol? A. YES B. NO
a. Did you use to take alcohol? A. YES B. NO
b. If YES, how long? .................................................................
c. If YES, why and when did you stop? ..................................................................................

45. Do you smoke? A. YES B. NO
a. Did you use to smoke? A. YES B. NO
b. If YES, how long? .................................................................
c. If YES, why and when did you stop? ..................................................................................

46. Does your emotional health/lifestyle affect your ability to access health care?  
A. YES B. NO
a. If YES, how? ..........................................................................................................................

47. Do you believe you are going to get better concerning your condition?  
A. YES B. NO
a. If YES, why do you think so?
..........................................................................................................................

..........................................................................................................................
b. If NO, why do you think so?
..........................................................................................................................

48. Do you have any specific means of coping with your condition aside medical care?  
A. YES B. NO
a. If YES, what is that?

49. Do you believe prayers can help you to get better or get cured from your condition?
   A. YES   B. NO
   a. If YES, why and how?
   .................................................................
   .................................................................
   .................................................................
   ....
   b. If NO, why?
   .................................................................
   .................................................................
   .................................................................
   ....

50. How does the health worker relate to you when at the clinic?
   A. BAD   B. GOOD   C. ENCOURAGING   D. INDIFFERENT

51. Does the attitude of the staff at the clinic influence your attendance of clinic?
   A. YES B. NO C. NOT SURE D. SOMEHOW

52. Do you believe that following the instructions by your doctor/nurse will help you improve or get better? A. YES B. NO

53. Does your religious organization give or show support for members suffering from some ailment? A. YES B. NO C. SOMETIMES

54. Is there any known social group that you belong to and identifies you as being diabetic? A. YES B. NO

Please turn over to the next page and answer PART II of the questionnaire.

THANK YOU FOR YOUR ATTENTION!!!
## APPENDIX B: Patient Health Questionnaire 9

### Patient Health Questionnaire (PHQ 9)

Over the *last 2 weeks*, how often have you been bothered by any of the following problems?

<table>
<thead>
<tr>
<th></th>
<th>Nearly every day</th>
<th>More than half the days</th>
<th>Several days</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ 1 - Little interest or pleasure in doing things</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>PHQ 2 - Feeling down, depressed, or hopeless</td>
<td></td>
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<tr>
<td>PHQ 3 - Trouble falling or staying asleep, or sleeping too much</td>
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<tr>
<td>PHQ 4 - Feeling tired or having little energy</td>
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<td>PHQ 5 - Poor appetite or overeating</td>
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<tr>
<td>PHQ 6 - Feeling bad about yourself- or that you are a failure or have let yourself or your family down</td>
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<tr>
<td>PHQ 7 - Trouble concentrating on things, such as reading the newspaper or watching television</td>
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<tr>
<td>PHQ 8 - Moving or speaking so slowly that other people could have noticed. Or the opposite-being so fidgety or restless that you have been moving around a lot more than usual</td>
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<tr>
<td>PHQ 9 - Thoughts that you would be better off dead, or of hurting yourself in some way</td>
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</tbody>
</table>