

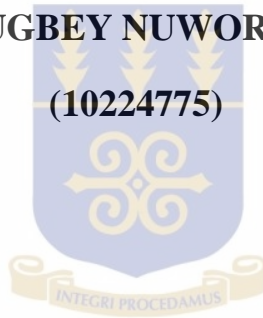
**ILLNESS PERCEPTION, RELIGIOSITY AND MENTAL HEALTH OF
DIABETIC PATIENTS IN GHANA**

**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA,
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BY

KUGBEY NUWORZA

(10224775)



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AWARD OF MPhil PSYCHOLOGY DEGREE**

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DECLARATION

This is to certify that this thesis is the result of research carried out by KUGBEY NUWORZA towards the award of the MPhil Clinical Psychology in the Department of Psychology, University of Ghana.

.....

KUGBEY NUWORZA

(STUDENT)

.....



.....

DR. SAMUEL ATINDANBILA

(PRINCIPAL SUPERVISOR)

.....

DATE

.....

DR. KINGSLEY NYARKO

(CO-SUPERVISOR)

.....

DATE

ABSTRACT

*This study examined the influence of diabetic patients' perception of their illness and their levels of religiosity on their mental health problems. A sample of 194 diabetic patients (50 Type -1 and 144 Type-2) was drawn from two major hospitals (Korle-Bu Teaching and Tema General Hospitals) in the Greater Accra Region of Ghana. The cross-sectional survey method was used and the participants were administered with the Brief Illness Perception Questionnaire (Broadbent, Petrie, Main, & Weinman, 2006), Santa Clara Strength of Religious Faith Questionnaire (Plante & Boccaccini, 1997) and the Brief Symptom Inventory (Derogatis, 1993). Results from the analysis using Pearson correlation showed that the diabetic patients' level of religiosity did not significantly relate with the mental health problems. However, illness perception correlated significantly and positively with their general mental health problem (GSI) and specific ones including levels of Somatization, Obsessive-Compulsion, Depression, Anxiety and Psychoticism. Further analyses using multiple regression analysis showed that level of general mental health problem (GSI) was significantly predicted by the perception of illness Coherence followed by perceptions Symptoms and Concern. **Multiple regression analysis** did not show any significant moderation effect of sex, age, duration of illness and level of education on mental health problem (GSI). However, MANOVA results showed that females report more mental health problem (GSI), Somatization and obsessive-compulsion but no significant sex differences in other specific mental health problems. Some of the findings from this study are consistent with some previous literature and inconsistent with some other earlier studies. The implications of these outcomes are discussed in relation to mental healthcare delivery, diabetic patients and the health sector. It is concluded that the diabetic patients' perception of their illness plays a significant role in their experience of mental health problems and also, sex and level of education affect their mental health problems significantly and therefore require attention from the health officials for a holistic healthcare.*

DEDICATION

This thesis is dedicated to my Family



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Thanks and Glory, be to the almighty God for His mercies endure forever.

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LIST OF ABBREVIATIONS

BIPQ-	Brief Illness Perception Questionnaire
BMI-	Body Mass Index
CRP- C-	Reactive Protein
DM-	Diabetes Mellitus
GHQ-	General Health Questionnaire
GSI-	Global Severity Index
HADS-	Health Anxiety and Depression Scale
HbA1c-	Glaciated Haemoglobin
ICD-10-	International Classification of Disorders (Tenth Edition)
IP-	Illness Perception
IPQ-	Illness Perception Questionnaire
IPQ-R-	Revised Illness Perception Questionnaire
MD-	Major Depression
OPD-	Out Patient Department
PHC-	Primary Health Care
WHO-	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1. Background of Study

Diabetes can be defined as a situation where an individual's body is incapable of producing the hormone insulin in levels required by the body cells to take up optimal glucose (Kumar & Clark, 2005). Also, Diabetes mellitus is a metabolic disorder characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both (World Health Organization, 1994).

Further, diabetes mellitus is characterized by gross loss of weight, frequent urination, excessive thirst and slow healing of wounds. Some other symptoms of diabetes include chronic fatigue and changes in vision. Therefore, if the diabetic condition is not well managed it can lead to complications such as loss of blood circulation to the heart and limbs (Darkwa, 2011). Failure of circulation of blood to the heart and limbs could pose serious threats to the lives of those suffering from the condition. These serious complications of diabetes are likely to predispose the diabetes patients to mental health problems that are commonly found among sufferers of chronic illnesses.

There are three broad categories of diabetes mellitus and these are the Type -1, Type-2 and Gestational diabetes. Type 1 diabetes indicates the processes of beta-cell destruction that may ultimately lead to diabetes mellitus in which "insulin is required for survival" to prevent the development of ketoacidosis, coma and death (World Health Organization, 1999). Type II diabetes is the commonest form of diabetes and is characterized by disorders of insulin secretion and insulin resistance. Gestational Diabetes (GD) mellitus refers to the onset or

initial recognition of glucose intolerance during pregnancy, usually in the second or third trimester (American Diabetes Association, 2001).

In sub-Saharan Africa (SSA), chronic illnesses are on the increase, however, growth rates of diabetes mellitus (DM) and hypertension are among the highest chronic diseases worldwide (Danquah et al., 2012). In Ghana, it is estimated that 4million people are living with diabetes and this number is expected to rise in the near future (National Diabetes Association of Ghana, 2012). Thus, several people are living with diabetes and its attendant complications. It is therefore believed that by 2025, more than 75% of the world population with diabetes will reside in developing countries and the countries with the largest populations of adults with diabetes will include: India, China and the United States (King, Aubert, & Herman, 1998). Similarly, a recent study estimated diabetes to increase significantly by 2030 (Shaw, Sicree & Zimmet, 2010).

Diabetes and hypertension have been showed to be accompanied with severe complications and reduced life expectancy for both diabetic and hypertensive patients (Hall, Thomsen, Henriksen & Lohse, 2011; Kengne, Amoah & Mbanya, 2005). Thus, when an individual is suffering from such illnesses, they bring along with them complications that are life threatening and as a result predispose the individual to reduced life expectancy compared to when such conditions are not present. In dealing with the diabetic condition therefore, it is important to explore some of these severe comorbid complications such that a holistic approach to management of the condition can be adopted.

Diabetes mellitus has several complications including medical, psychological as well as social problems. Some examples of medical complications of diabetes mellitus include stroke, hypertension, amputation, nephropathy, neuropathy, retinopathy, cardiovascular, impotence, skin lesions (Langat, 2011). Some authors have reported how diabetes can negatively affect

the health of people living with the condition. For instance, diabetes is showed to be a predictor of premature mortality because it is associated with a substantial increase in mortality from all causes most especially coronary heart diseases (Barreto, Passos, Almeida & Assis, 2007).

Additionally, musculoskeletal complications are most commonly seen in patients with a longstanding history of type 1 diabetes, but they are also seen in patients with type 2 diabetes. Some of the complications have a known direct association with diabetes, whereas others have a suggested but unproven association (Kim, Edelman & Kim, 2001). Examples of some of these musculoskeletal complications according to Kim, Edelman and Kim (2001) include complications with Hands (Diabetic cheiroarthropathy-stiff hand syndrome or syndrome of limited joint mobility, Flexor tenosynovitis -trigger finger, Dupuytren's contracture, Carpal tunnel syndrome), Shoulders (Adhesive capsulitis -frozen shoulder, Calcific periarthritis, Reflex sympathetic dystrophy) Feet (Diabetic osteoarthropathy- Charcot or neuropathic arthropathy), Muscles (Diabetic muscle infarction) and Skeleton (Diffuse idiopathic skeletal hyperostosis)

Aside the medical complications that are associated with diabetes mellitus, several mental health problems have been reported by several studies. For instance, depression and anxiety (Lin & von Korff, 2008), poor psychological wellbeing (Peyrot et al., 2004), affective disorders (Hermanns, Kulzer, Krichbaum, Kubiak & Haak, 2004), sexual dysfunction (Coker, Ohaeri, Lawal & Orija, 2000), irritability, anxiety, depression, suicidal ideas and cognitive deficits (Blanz, Rensch - Reimann, Fritz-Sigmund & Schmidt, 1993) and eating disorders are some of the common mental health problems reported in diabetic population relative to the mental health of the general population. In a study of diabetic patients and non-diabetic patients King, Mainous and Pearson (2002) reported that people with diabetes have higher

risk of cardiovascular mortality and higher C-reactive protein (CRP) levels than people without diabetes.

However, when diabetic patients have comorbid mental health problems, it affects other aspects of their wellbeing as well as adherence to treatment regimen. For instance, Sulaiman, Hamdan, Tamim, Mahmood and Young (2010) reported that mental health status and diabetic complications are significantly related to each other. This is because depression among the diabetic patients was associated with problems in adherence, self-care and severe physical symptoms. Thus, mental health complications that result from diabetes need to be dealt with to prevent the further complications that are associated with the presence of mental health issues.

Living with any type of chronic disease, the person either has to make minor or major lifestyle adjustments. Diabetes, in particular, can eventually take its toll on the emotional, psychological, and physical wellbeing of any person. These adjustments can lead to either successful adherence to medical regimens and control of the disease, or among other things, ineffective or maladaptive coping (Duangdao & Roesch, 2008). How the individual adjusts to the diabetic condition depends on the resources available to the individual at personal, community and societal levels.

Several factors have been identified to have a significant influence on the mental health and illness outcome of diabetic patients. Some of these factors include illness perception, level of patients' religiosity as well as the patients' demographic characteristics. In the case of diabetic patients, Mosorovic, Brkic, Nuhbegovic and Pranjic (2012) asserted that diabetes mellitus is a disease that is no longer just an individual problem of the patient, but it is assuming psychological and socio-medical significance of mass disease. Thus, in trying to reduce the

rate of complications associated with diabetes, both psychological as well as socio-medical factors should be taken into consideration.

Several factors have been found to influence the levels of mental health problems among diabetic patients. One of these variables is how the diabetic patients perceive their illness. Illness perception has been studied extensively in relation to several medical and psychological conditions. Perception is described as the process by which an individual interprets and organizes sensations and events to produce a meaningful experience of the world (Lindsay & Norman, 1977). These interpretations are guided by the specific knowledge, beliefs and expectations characterizing the individual (Alsén, 2009). Perception in terms of illness may be conceptualised as how people understand and make sense of their diseases and/or disabilities, e.g. illness perceptions. In this respect, illness perceptions to some extent correspond to the conceptualizations of illness in contrast to disease (Alsén, 2009).

There are several determinants of health outcomes among patients suffering from any form of illness and as such, outcomes of medical management in patients with chronic illness are determined not only by objective factors but also by behavioural and social factors (Leventhal, Weinman, Leventhal & Phillips, 2008). Some of these behavioural and social factors are related to how the patients appraise their illness on several dimensions. Some of these perceptual dimensions of the illness perception include the causal attribution, timeline, severity, consequences, understanding as well as the personal control of the individual over the condition. The extent of these perceptions to a large extent determines how the individual patients react to treatment as well as other management regiments.

Furthermore, research has shown that people vary in how they perceive their health status and that these perceptions often are independent of the actual physical conditions that are being suffered (Taylor, Kemeny, Reed, Bower & Gruenewald, 2000). For example, people vary in

how they perceive their possibilities to influence or control their health (Wallston, 2004), whether their condition is acute or chronic (Lau & Hartman, 1983) or whether or not their specific situation is hopeful (Scheier & Carver, 1985). Such perceptions may in turn determine individuals' behaviour as well as their response to managing health threats related to a disease or a symptom (Alsén, 2009). Thus, the individual's active role in terms of thought processes affect their health outcomes and therefore, Schrag, Jahanshashi and Quinn (2001) asserted that patients' perceptions of their condition are likely to play an important role in how they adjust to their illness.

The number of symptoms individuals identify with their illness; their beliefs about the cause, consequences, duration, and controllability of their illness; and their emotional appraisal and perceived understanding of the illness affects their symptom experience, functional status, self-management behaviours, and psychological response to their illness (Leventhal, Leventhal, & Cameron, 2001). For instance, Petricek et al., (2009) found among type-2 diabetic patients that the illness perception components such as perceptions of concern, personal control and concern, treatment control, and understanding of the diabetes were significant predictors of body mass index, fasting blood glucose, total cholesterol and blood pressure respectively. Similarly, it was found that illness perception predicted a lot of health outcomes among diabetic patients including adherence to insulin, cholesterol and antihypertensive medications, exercise, and diet (Broadbent, Donkin & Stroh, 2011). This therefore demonstrates that illness perception is important in trying to understand the health needs of diabetic patients.

Additionally, the individual's level of religiosity has been showed to have significant influences on his/her psychological wellbeing and distress. However, the study of religion in psychology has not been without disagreements as it is seen as not being scientific. In the past years there has been a change from negative attitudes in psychology, concerning religion, to

the identification of more positive relations between religion and different aspects of mental health (Rusu & Turliuc, 2011). Religiosity is a multi-layered concept involving cognitive, emotional, motivational and behavioural aspects (Hackney & Sanders, 2003). Richards and Bergin (1997) see religion as a subset of the spiritual, considering that it is possible for someone to be spiritual without being religious and to be religious without being spiritual. Being spiritual means having a transcendental relation with a superior being, whereas being religious means adopting a certain religious creed or church (Rusu & Turliuc, 2011). However, this separation of religiosity and spirituality is not the case in our context as spirituality and religiosity cannot be decoupled. Thus, a religious person in the Ghanaian setting is seen as spiritual and vice versa.

Furthermore, religion is seen to have important influence on the individual as well as the society at large. For instance, Frey and Stutzer (2002) asserted that religion raises happiness because church attendance is an important source of social support. Also, religion can instill life with meaning and purpose, and religious people are better at dealing with negative circumstances in life and church members live healthier lives and live longer which also contributes to happiness (Frey & Stutzer, 2002). As a result of these influences of religion on the individual, Krause and Wulff (2005) noted that church-based friendship may promote a sense of belonging and thus enhance physical and mental health.

More so, research evidence has pointed to the fact that some forms of religiosity are associated with specific health related issues. For example, religiosity has been associated with low levels of depression (McCullough & Larson, 1999), a personal well-being (Koenig, 2001), positive social attitudes (Baton et al., 1993), a low risk of divorce and an increase in the degree of marital functionality (Mahoney, Pargament, Tarakeshwar & Swank, 2001). Tsang and McCullough (2003) in their analysis of the relationship between religiosity and

health related issues, it was shown that religiosity correlates significantly with physical and mental health, tolerance, pro-social behaviour and positive interpersonal relationships. These significant influences of religiosity on several aspects of individual's life is worth exploring to ascertain the extent to which religiosity affects these aspect of existent.

More so, some demographic characteristics of the diabetic patients have been showed to predispose them to mental health problems. Some of these demographic characteristics of the diabetic patients include sex, age, marital status, duration of illness and type of diabetes among others. For instance, Jimenez-Garcia et al., (2011), Guruprasad, Niranjand and Ashwin (2012) and Hermanns et al., (2005) found among diabetic patients that the female sex is a risk factor for development of psychological distress. Other researchers have aslo found significant age differences in the development of mental health problems among diabetic patients (Paddison, 2010; Jimenez-Garcia et al, 2011; Jadoon et al., 2012).

From the discussions of the variables above, it becomes necessary to investigate how these variables relate with one another. That is, an individual perception of the illness may result in dependence on his/her religious faith to adjust to the illness. Perceiving the illness as threatening is usually accompanied by psychological distress. However, these perceptions and reactions to the illness are usually influenced by individual characteristics. Therefore, the individual characteristics of the diabetic patients influence their mental health significantly

1.2. Statement of the Problem

In contemporary Ghana, several medical problems are being reported at the general hospitals and clinics for treatment. Most of these medical problems are accompanied by mental health problems which should have been tackled holistically (bio-psychosocial model) but treatment is just limited to the physical aspect (bio-medical). However, the mental health elements of

the medical conditions are usually neglected though researches have demonstrated that the associated mental health problems can influence the prognosis and the course of such illnesses (Lin et al., 2004).

Additionally, with the prevalence of diabetes mellitus predicted to be very high by 2030 (Shaw, Sicree & Zimmet, 2010) and affecting people mostly in developing countries, the psychological care and intervention that is required is in short supply if not nonexistence. The individual patients may have their own ways of dealing with the mental health challenges that accompany their illness but the question is, which individual resources do they use, how do they use them and how these individual resources affect their general mental health. Therefore, there is the need to identify the factors that are likely to have significant influence on mental health of diabetic patients to inform therapy.

In the management of these physical conditions, one would think that all health-related professionals would be brought on board but the opposite is what we are facing in Ghana. Thus, psychological care which is very critical as a result of the powerful role of the mind is always nonexistence and this cannot be relegated to the background in the total management of the condition. This therefore presents a challenge to the health system which needs to be dealt with judiciously to benefit the patients and society at large.

Furthermore, one crucial aspect of health that seems to be ignored in healthcare delivery in the country is the interpretations and beliefs held by the patients about their illness (diabetes). This is because the beliefs and perceptions held by an individual about their health conditions to a large extent influence their health outcomes and treatment regimen. That is, if the individual perceives his/her illness to be more or less threatening, how does this affect his/her wellbeing? Therefore, when these beliefs and perceptions about the illness (diabetes) are not understood and incorporated into the care of diabetic patients, a lot of problems are neglected

as several researchers have demonstrated a significant association between illness perception and mental and physical health outcomes (e. g. Broadbent, Donkin & Stroh, 2011; Petricek et al., 2009; Leventhal, Leventhal, & Cameron, 2001).

More so, a central part of the Ghanaian which is religion (Gyekye, 1996) seems to be neglected in the provision of healthcare especially in the physical illnesses. However, as the complications of diabetes are not limited to only the medical ones, most people rely on their individual resources such as religion to cope with the illness. The question that arises is whether the diabetic patients' religious resources are utilized in providing healthcare services as it is well known that prayer camps and healing centers continue to serve as refuge for patients. To address this shortfall however, research is needed to examine whether indeed the individual's level of religiosity protects him/her against unfavorable consequences of diabetes.

1.3. Relevance of the Study

This study will highlight the common mental health problems in diabetic patients in Ghana. The identification of these common mental health problems would form the basis for incorporating psychological care into the treatment plan. Coupled with the identification of the common mental health problems would be how the perceptions and religiosity levels of the diabetic patients are likely to influence such mental health problems. This is because the patients do usually rely on both personal as well as their social resources in dealing with health problems. The results from this study will equip clinicians with information on how to cater for the mental health needs of diabetic patients in Ghana since this study is one of the few in the area of diabetic and mental health outcomes.

The study outcomes will inform policy decision making by recommending measures to be put in place in the care of diabetic patients. This study will add to existing literature in the area of illness perception and diabetic complications (mental health problems) since the relevant literature are few if not non-existent. Also, as a result of paucity in the religion and mental health literature in Ghana, the outcomes of the study would form the basis for further studies. In the long run, this study will help shape the scope of management of diabetes mellitus which is predominantly biomedical by including more allied health professionals into the management plan.

1.4. Aims and Objectives

The main aims of this current study are to investigate the relationship between diabetic patients' religiosity and mental health outcomes, as well as their illness perception and mental health. Specifically, this study seeks;

1. To examine the relationship between diabetic patients' level of religiosity and their mental health problems.
2. To investigate whether the perception of the diabetes by the patients significantly relates to their mental health problems.
3. To examine which of the illness perception components predict specific mental health problems significantly.
4. To investigate whether patients' demographic characteristics such as sex, age, level of education and duration of illness influence their mental health problems significantly.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This current study seeks to examine the influence of patients' perception of diabetes mellitus and how this perception impacts their mental health outcomes. Also, the influence of diabetic patients' religiosity and their mental health outcomes are examined as well as their demographic characteristics. This chapter therefore, presents the theoretical frameworks underlying the study with the view of elaborating on the theories that explain the various variables in the study by putting them into perspective. The theories of concern in this present study include the Self-Regulatory Model (Leventhal, Meyer & Nerenz, 1980), the Strength Model of Self Control (Baumeister, Vohs & Tice, 2007), the Health belief Model (Rosenstock, 1966) and the Religious Coping theory (Pargament, 1997). The reviews of the theories underpinning the study are followed by the empirical literature on the various variables in the study. The first section relates to empirical evidence on Diabetes and Mental Health, Religion and Mental Health, and Illness Perception and Health Outcomes. These theoretical and empirical literature reviews are followed by the rationale for the present study, the hypotheses to be tested and the operational definitions of key terms.

2.2. Theoretical Frameworks

Three main theories/models that will guide this study are listed and discussed into details in the section below.

2.2.1. Self -Regulatory Model (SRM) by Leventhal, Meyer and Nerenz (1980, 1997)

This model proposes that individuals actively generate cognitive and emotional representations of health threats and that these representations guide and regulate behaviour (Leventhal et al., 1997). The model indicates that internal stimuli (e.g. the experience of symptoms) as well as stimuli from the environment (e.g. risk information, witnessing a relative's illness) may trigger cognitive and emotional representations. Based on these representations individuals derive an action plan to cope with the threat they perceive. The success of a particular coping strategy is appraised and feeds back into both the representation and the action plan, which may be modified accordingly.

This model therefore, helps in understanding how a particular illness condition is conceptualized by patients and how this understanding facilitates adjusting and coping with the condition. In this regard, several perceptual components (cognitive and emotional) have been identified to form part of how patients interpret their illnesses. Thus, the Leventhal's Self-Regulation Model theory proposes five separate components. These components identified in the model are perceptions of identity, cause of illness, duration, consequence, and curability or controllability (Ogden, 2004).

Identity: This refers to the label given to the illness (the medical diagnosis) and the symptoms experienced (Ogden, 2004). This identity element provides an individual with a label and the associated symptoms which shape how the condition is interpreted. For instance, 'I have diabetes' which signifies the label and 'I urinate more frequently than usual' representing the symptom.

The perceived cause of the illness: This refers to factors identified by the individual as contributing to the emergence of the condition under consideration. These causes may be

biological, such as a virus or a lesion, or psychosocial, such as stress or health-related behaviour (Ogden, 2004). For instance, ‘my diabetes is from my family, stress and spiritual among others’.

Time line: According to Ogden (2004, p50), it “refers to the patients’ beliefs about how long the illness will last, whether it is acute (short-term) or chronic (long-term)”. For instance, ‘my diabetes will last forever’ and ‘my diabetes will be over soon’. These items reflect the perceptions of the duration of the illness by the patients.

Consequences: This refers to the patient’s perceptions of the possible effects of the illness on their life. Such consequences may be physical (amputation) emotional (depression and anxiety) or a combination of factors. For instance, ‘My diabetes will prevent me from eating my favorite foods and also from my usual lifestyles.

Curability and controllability: Patients also represent illnesses in terms of whether they believe that the illness can be treated and cured and the extent to which the outcome of their illness is controllable either by themselves or by powerful others such as doctors, God and even healers. For example, ‘If I follow my diet regimen, my symptoms will disappear’ and ‘If I get my medical treatment from my doctor my illness will be cured’.

These illness perceptions are activated by the long term memory, and the representation is formed based on the comparison between the current incident and the individuals’ former belief (Yuniarti, Dewi, Ningrum, Widiastuti, & Asril, 2013). Thus, in perceiving the illness condition, the individual relies on previously stored information about the illness in making sense out of the condition. This stored information could be accurate or inaccurate but then has a significant influence on the symptoms ascribed to the illness, duration, causes, controllability/curability as well as the effect on the individual.

Several measures have been developed to measure illness perception in patients across different conditions. The original measure was named as The Illness Perception Questionnaire (IPQ) developed by Weinman, Petrie, Moss- Morris and Home (1996) to provide a theoretically derived measurement instrument suitable for use with any patient population. There are five subscales making up the IPQ that attempt to operationalize the components of self-regulation theory. These five subscales are illness identity, perceptions of causation, timeline perceptions, beliefs in severity of consequences, and perceptions of cure or control of the condition (Fortune, Richards, Griffiths & Main, 2002). The scale was further modified and renamed as the revised illness perception questionnaire (IPQ-R) by Moss-Morris et al., (2002). This revised version measures perceptions of identity, consequences, cause, personal control, treatment control, timeline acute/chronic (duration of illness), timeline cyclical (does illness/symptoms occur in cycles), illness coherence (extent to which the patient understands their condition) and emotional representations generated by the illness (e.g. fear). The revised version has been shown to have superior psychometric properties compared to the earlier version (Knibb & Horton, 2008).

However, a recent version of the illness perception scale was developed by Broadbent, Petrie, Main and Weinman (2006) and it was named as The Brief Illness Perceptions Questionnaire (BIPQ) for the illness perception, which measures the dimensions: identity, consequences, duration, personal control, treatment control, understanding, causes, symptoms and emotional representations. This measure has been shown to be shorter and easier as well as demonstrating good psychometric properties (Broadbent, Petrie, Main & Weinman, 2006).

Some studies have supported the self-regulation theory in explaining illness outcomes in several illness conditions. For instance, the model was found to be significant in explaining psychological distress in allergy sufferers (Knibb & Horton, 2008), adjustment in breast

cancer survivors (Jørgensen, Frederiksen, Boesen, Elsass & Johansen, 2009). Similarly, Hagger and Orbell (2003 in Ogden, 2004) carried out a meta-analysis of 45 empirical studies which used Leventhal's model of illness cognitions and concluded from their analysis that there was consistent support for the different illness cognition dimensions and that the different cognitions showed a logical pattern across different illness types.

2.2.2. The Strength Model of Self Control (Baumeister, Vohs & Tice, 2007)

Related to the self-regulation model (Leventhal et al., 1980, 1997) above is the Strength Model of Self Control (Baumeister, Vohs & Tice, 2007) which stemmed from Self-Regulation. Baumeister and Vohs (2007, p.1) defined self-regulation as “the self's capacity for altering its behaviour”. That is, the ability of the individual to be able to adapt to both internal and external demands by making conscious attempts at meeting these demands. This self-regulation/control theory has been showed to be influential in many aspects of human existence including mental and physical health outcomes, adjustment and interpersonal relationships (Baumeister & Boone, 2004 in Baumeister & Vohs, 2007).

Furthermore, earlier self-regulation proponents identified three main domains including standards set by the individual, monitoring the set standards and strength/willpower (Baumeister & Vohs, 2007). That is, in self-control/regulation, there are standards set by the individual which guide behaviour and the standards are monitored with the presence of willpower. It can therefore be deduced from these domains of self-regulation that, the individual is an active part of issues affecting him/her life by altering behaviors, beliefs and perceptions. Thus, if an individual is afflicted with an illness like diabetes, he/she requires some self-regulation to maintain stable emotional outcomes as the demands of the illness are likely to destabilize the self.

However, as the model gained grounds in both research and applied settings, a fourth domain which is motivation was introduced to complement the earlier three domains ((Baumeister & Vohs, 2007). Motivation in the sense of self-regulation has been seen as the engine to propel the individual to regulate the self as lack of motivation in the face of clear standards, effective monitoring and abundance resources could lead to low self-regulation (Baumeister & Vohs, 2007). That is, the level of motivation of the individual to act is crucial in self-regulation as more motivation leads to high self-regulation.

The self-control/regulation has been showed to have practical implications as pointed out by some authors. For instance Tangney, Baumeister and Boone (2004) reported that increased rates of psychopathology and symptoms are associated with low self-regulation whereas psychological wellbeing, good adjustment and secure attachment are associated with effective self-regulation/control. It is therefore, concluded from these implications that the self-regulation model provides a useful theoretical and practical guide for practitioners as the understanding of the model could be utilized in providing psychological care for positive outcomes.

2.2.3. Health Belief Model (Rosenstock, 1966)

The health belief model was initially developed by Rosenstock (1966) and further by Becker and colleagues throughout the 1970s and 1980s in order to predict preventive health behaviors and also the behavioral response to treatment in acutely and chronically ill patients. In recent years however, the health belief model has been used to predict a wide variety of health-related behaviors in several conditions (Ogden, 2004). Thus, the model has been seen as one of the important propositions that guide both action and research in the field of health and health-related management issues.

Additionally, the health belief model helps in explaining how an individual's perception about an illness influences his/her line of action and addresses the individual's perceptions of the threat posed by a health problem (susceptibility, severity), the benefits of avoiding the threat, and factors influencing the decision to act (barriers, cues to action, and self-efficacy). According to Ogden (2004, 24) "the Health Belief Model predicts that behavior is a result of a set of core beliefs, which have been redefined over the years". The core beliefs that were proposed by the proponents of the health belief model are built around the individual's own subjective interpretations and perception in terms of susceptibility to illness, the severity of the illness, the costs involved in carrying out the behavior, the benefits involved in carrying out the behavior and cues to action, which may be internal or external.

However, as the health belief model has been criticized certain reforms or modifications were made to include the construct 'health motivation' to reflect an individual's readiness to be concerned about health matters (Ogden, 2004) and Becker and Rosenstock (1987 cited in Ogden, 2004)) have also suggested that perceived control should be added to the model. These additions or modifications have made the health belief model applicable in many health-related situations. For instance, the perception of control either real or imagined can, to some extent, determine how the individual will act in the face of health threat. That is, if the individual thinks that s/he can do something about the health threat posed by a condition, more efforts will be put into place rather when there is perceived uncontrollability on the part of the individual.

Research findings have provided support for the health belief model in predicting a variety of health related behaviors including dietary compliance, safe sex, having vaccinations, making regular dental visits and taking part in regular exercise programmes. These health-related behaviors are believed to be related to the individual's perception of susceptibility to the

related health problem, to their belief that the problem is severe and their perception that the benefits of preventive action outweigh the costs (Becker & Rosenstock, 1984 in Ogden, 2004). Similarly, Janz and Becker (1984 in Ogden, 2004) used the health belief model in a study and found that the best predictors of health-related behaviors are perceived barriers and perceived susceptibility to illness.

On the contrary, Becker and Rosenstock (1984 in Ogden, 2004) conducted a meta-analytic review of 19 studies that included measures of the health belief model to predict compliance and concluded that the best predictors of compliance are the costs and benefits and the perceived severity. This therefore showed that each of the components in the health belief model becomes significant in the context in which it is being used such that in certain instances a component will be significant but in other health-related instances. As a result of these limitations, some authors have criticized the model for being static (Schwarzer, 1992) and also that it is the symptoms (Leventhal, Prohaska & Hirschman, 1985 in Ogden) rather than the individual factors as suggested by the health belief model.

2.2.4. Religious Coping (Pargament, 1997)

This theory posits that when people are faced with problems, they try to cope with their religious resources inherent in them which are likely to influence their health outcomes. Pargament (1997) has suggested that particular styles of religious coping are associated with better and worse psychiatric outcomes – in particular, Pargament (2002) concluded that higher well-being is associated with internalized religion, intrinsically motivated religion, and a secure relationship with God. Lower well-being is associated with imposed religion, religious beliefs and behavior that have not been examined, and a tenuous relationship with God and the world.

In this regard, Pargament (1997 in Cummings & Pargament, 2010) asserts that religious coping occurs when a stressor related to a sacred goal arises or when people call upon a coping method they view as sacred in response to a stressor. As a result of this assertion by Pargament (1997), it can be put forward that any form of illness that requires the individual to adjust his/her lifestyle becomes a major stressor that requires some amount of coping. One of the most powerful coping resources that people depend on is the support offered by religion which can take several forms including material, emotional as well as psychological support (George, Larson, Koenig & McCullough, 2000).

Furthermore, there have been explanations as to why religiosity is very important in influencing illness outcomes. Some of these explanations include the fact that, religiosity encourages healthful lifestyles, provides opportunities for supportive relationships, assists in finding meaning in adversity, and promotes social connectivity among people (Koenig, McCullough & Larsen, 2001). Thus, religiosity is seen as a buffer which cushions people against the impacts of major life stressors in the form of illness, disaster and trauma among other things.

Studies have showed that religion serves as a protective factor in the illness outcomes of several conditions. For instance, Campbell, Yoon and Johnstone (2010) found that patients who attended public religious services and activities and who perceived having interactions with the divine generally viewed themselves as being healthier than those who engaged in these religious coping strategies less frequently. Similarly, a study among chronic pain patients in Belgium revealed that those who reported experiencing closeness and security with God interpreted their condition as an opportunity to change their life or reflect upon what is essential in life (Dezutter et al., 2010). That is not to say that religious dependence protects

individuals against negative illness outcome as some studies have also documented that religiosity may lead to negative outcomes (e.g. Maranell, 1974)

2.3. Review of Related Studies

In pursuant of empirical evidence to establish the relationships among several diabetes-related variables, several studies were conducted with varied outcomes depending on the purpose as well as the methodology employed in these studies. The review of some of these related studies are divided into three sections namely; Diabetes and Mental Health Outcomes, Religiosity and Mental Health Outcomes and Illness Perception and Health Outcomes.

2.3.1. Diabetes and Mental Health Outcomes

As has been pointed out earlier by some researchers, diabetes has several complications and the ones under consideration in this research are mainly the mental health complications. Several authors have reported the prevalence and the incidence of mental health problems among diabetic patients and some of these studies are evaluated in this section. In a study by Coker, Ohaeri, Lawal and Orija (2000), the prevalence of specific psychiatric disorders and general cognitive impairment were assessed in patients with diabetes mellitus. In addition the researchers examined the relationship between psychiatric morbidity and clinical variables. The findings from this study showed that only 11% of the patients had sexual dysfunction while 31% reported psychiatric symptoms. In terms of the psychiatric diagnosis based on the ICD-10, 6% of the patients had generalized anxiety and 4% has a mild depressive disorder. Also some subjective memory disturbances were reported for the patients. It was also reported that insulin-dependent patients have had significantly more widespread psychiatric symptoms than the non-insulin dependent. Demographic characteristics such as low occupational status, duration of illness and sexual dysfunction were significantly associated with Psychiatric

symptomatology. Though the study highlighted some significant associations among the diabetes and psychiatric symptoms, it was not able to relate the clinical features to the specific psychiatric disorders and the sample size in the study was relatively small in terms of making generalization.

Lin et al., (2004) assessed whether diabetes self-care, medication adherence, and use of preventive services were associated with depressive illness in a large health maintenance organization. Several medical issues were found but in terms of mental health problems among diabetic patients, major depression was associated with less physical activity, unhealthy diet, and lower adherence to oral hypoglycemic, antihypertensive, and lipid lowering medications. In contrast, preventive care of diabetes, including home-glucose tests, foot checks, screening for micro-albuminuria, and retinopathy was similar among depressed and non-depressed patients. The researchers concluded that in a primary care population, diabetes self-care was suboptimal across a continuum from home-based activities, such as healthy eating, exercise, and medication adherence, to use of preventive care. Major depression was mainly associated with patient-initiated behaviors that are difficult to maintain (e.g., exercise, diet, medication adherence) but not with preventive services for diabetes. From these findings, it is observable that some elements of mental health problems were reported by the diabetic patients which gives an indication of a psychiatric comorbidity but was limited to only depression.

In a similarly study, Hermanns et al., (2005) examined the prevalence of clinical and subclinical anxiety and affective disorders among diabetic patients in Germany and found that the prevalence rate of affective disorders was higher than anxiety disorders. Further outcomes revealed that affective disorders among diabetic patients were significantly predicted by the patients' characteristics such as age, female gender, living alone, insulin treatment in Type 2

diabetes, hypoglycaemia problems and poor glycaemic control. However, anxiety symptoms among the diabetic patients were significantly associated with female gender, younger age and Type 2 diabetes. This study outcome provides an idea of which personal characteristics that are likely to predispose diabetic patients to mental health problems and I think such an outcome would help in shaping clinical practice and further studies.

Peyrot et al., (2005) conducted a cross-sectional study using face-to-face or telephone interviews with diabetic patients and health-care providers in 13 countries in Asia, Australia, Europe and North America in order to examine patient- and provider-reported psychosocial problems and barriers to effective self-care and resources for dealing with those barriers. Findings from the study showed that diabetes-related worries were common among patients, and providers generally recognized these worries. Also, many patients (41%) had poor psychological wellbeing and the providers reported that most patients had psychological problems that affected diabetes self-care, yet providers often reported they did not have the resources to manage these problems, and few patients (10%) reported receiving psychological treatment. However, the study failed in determining whether any significant differences exist between those who have had psychological treatment and those who have not. This study clearly exhibited the need for psychological care but it was showed only few of the patients had access to such psychological services.

Furthermore, to explore the levels of anxiety, coping strategies used, and relationships that exist among anxiety, coping strategies, sociodemographic and medical characteristics among Turkish sample of type-1 and type-2 diabetes, Tuncay, Musabak, Gok and Kutlu (2008) found that 79% of the participants in their study experienced anxiety and majority of the participants reported to integrate their diabetes. Acceptance, religion, planning, positive reframing, instrumental support, emotional support, self-distraction and venting were the most frequently

used coping strategies among the sample. This study demonstrated how personal characteristics of diabetic patients influence their comorbid anxiety but narrow in scope as there are other equally important mental health problems that results from living with diabetes.

Recent prevalence studies have also shed light on mental health outcomes and their associated factors among diabetic patients. For instance, Lin and von Korff (2008) estimated a 12-month prevalence rate of mood, anxiety, and alcohol-use disorders among community samples of diabetic persons and assessed whether associations of specific mental disorders with diabetes are consistent across diverse countries after controlling for age and gender. The outcome indicated that persons with diabetes were at a greater risk of mood and anxiety disorders than persons without diabetes when their age and sex were held constant. However, this study did not examine the individual psychosocial factors that could be influencing the mental health outcomes of the diabetic patients in coping with their condition.

Roupa et al., (2009) examined the occurrence of anxiety and depression symptoms in patients with Type 2 Diabetes Mellitus with regard to sex and body mass index (BMI). The impacts of the respondents' demographic and clinical features were examined on their anxiety and depression levels. The self-completed questionnaire (HADS) was used for anxiety and depression level evaluation and the results showed that percentages of anxiety symptoms in women were three times higher in comparison to men. The study also showed women to have had a twofold percentage of depression symptomatology than men. Additionally, when the relation between sex, age and Body Mass Index (BMI) and depression-anxiety symptoms was examined, it was shown that high BMI favours the occurrence of modest or severe symptomatology, as risk increases for any additional BMI unit. This study provides an insight to how patients' gender can influence their mental health outcomes and this can help

clinicians in addressing gender-related issues. However, the sample size for the study was relatively small.

In a related study by Liu, Fu, Wang and Xu (2010) among type-2 diabetic patients in China, it was found that majority of the patients experienced at least one form of complication or the other. It was also identified that the patients had both macrovascular and micro vascular complications. The cities of the respondents, their ages and duration of their illness were also found to have significant influences on their levels of chronic complications. The number of the diabetes-related complications was also found to have influenced glycemic control among the patients. From this study, it can be observed that the demographic characteristics of diabetic patients are very important in relation to their mental health outcomes.

Similarly, Paddison (2010) explored the levels of physical and psychological wellbeing among adults with Type 2 diabetes and sought to identify the clinical, demographic, and psychological factors that are associated with differences in wellbeing in New Zealand. Analysis revealed that Mean HbA1c was 7.5% though there was a significant variation across ethnic groups with metabolic control highest among New Zealand Europeans and lowest among Pacific peoples. Further analysis demonstrated that Pacific groups experienced the highest levels of distress about diabetes, and concern about prescribed medication. It was also realized from the study that personal characteristics such as young age, overweight, concerns about prescribed medications, and those of Pacific ethnicity are associated with the experience of adverse health outcomes such as poor metabolic control and diabetes-related distress. However, the sample in the studies above were too narrowed as the studies were only done among those with type 2 diabetes and not the other categories which could make the findings cut across all the diabetic categories.

Sulaiman et al., (2010) reported in their study that diabetes complications and mental health status are significantly related. That is, diabetic patients who are depressed experienced poor self-care, adherence problems and severe physical symptoms. The findings demonstrated the relevance of mental healthcare issues in diabetes management because untreated mental health problems result in significant complications for the patients. However, the researchers' use of correlation does not give the exact impact of these variables on one another and as such difficult to draw any causal inferences.

In a study, Naranjo, Fisher, Areán, Hessler and Mullan (2011) examined major depressive disorder and its associated factors among patients with type-2 diabetes over time. It was found that development of future depression was predicted significantly by past history of depression and the experience of negative affect by the patients. Some meditational relationships and moderations were found between diabetes and development of major depressive disorder. However, as with some earlier studies, the composition of the sample of the study makes the findings limited to those with type 2 diabetes and not the others. The study also did not consider other important mental health problems that could be present within the studied sample.

In addition to the psychological wellbeing and distress among diabetes patients, Rajesh, Kannadasan and Vijayakumar (2011) evaluated the association between gender, age and social habits with regard to Cognitive dysfunction in Diabetic patients. The randomized prospective study was used and 500 diabetic patients of various socio-demographic characteristics, extending over a period of eighteen months with baseline and follow up's scheduled at every six months intervals with the aid of Mini Mental State Examination (MMSE scale) were used. Results indicated that older diabetic patients exhibited a potential decline in cognitive function and there was a significant impact of diabetes on cognitive

function with regard to gender. That is, women with diabetes marked a high level of cognitive decline than men of the same age group. Despite these findings, the study was projective in nature as the outcomes indicated the risks of developing a cognitive decline. Also, no psychosocial functioning of the diabetic patients was explored in addition to their cognitive functioning.

Abbas, Abbasi, Vahidi, Najafipoor and Farshi (2011) conducted a study to establish the role of exercise in improvement of psychological problems in diabetic patients by sampling 80 participants with Type -2 Diabetes Mellitus. The participants were assigned to take exercise for 90 minutes per session, 3 times a week for a period of 4 months and were also made to answer the GHQ-12 questionnaire before and after the study project. Findings from the study demonstrated a significant decrease in the mean GHQ-12 scores. Further, factor analysis by Graetz's three-factor model suggested that factor I (anxiety and depression) associated with more improvement than the other factors. Thus, some lifestyle activities aid in psychological functioning of type -2 diabetic patients. The problem however with these results are the extent to which the outcomes can be extended to the other types of diabetes and the role of cognitive as well as other individual characteristics in influencing psychological wellbeing.

In line with some of the earlier studies reported among diabetic patients, Bener, Al-Hamaq and Dafeeah (2011) examined whether there is a relationship between high depression, anxiety, and stress symptoms in Diabetes Mellitus (DM) patients in comparison to a group of controls. The outcomes of the study showed that most of the studied diabetic cases (33.6%) and healthy controls (30.9%) were in the 40-49 years age group and significantly larger proportion of Diabetes Mellitus subjects had severe depression, severe anxiety and severe stress compared to healthy controls. The study showed some predictive connections among the variables in the study such that systolic blood pressure, duration of diabetes and obesity

were the major predictors for high depression scores among diabetic. For high anxiety scores among diabetic cases, systolic blood pressure, obesity and smoking were the major predictors and finally, high stress scores were predicted by systolic blood pressure, diastolic blood pressure and physical activity. Also, significant sex differences were found such that diabetic women had higher depression, anxiety, and stress scores than men. However, no significant association was observed between the diabetic complications and depression, anxiety or stress scores. The study shed so much light on the impact of diabetic patients' personal characteristics on their levels of depression and anxiety.

To compare the prevalence of psychological distress and mental disorders between diabetes and non-diabetes sufferers and to identify associated factors, Jimenez-Garcia, et al., (2011) used a case-control study found that prevalence of mental disorders was 18.6% among diabetics and 16.4% among controls. Additionally, 26% of diabetics and 18.9% of the non-diabetic suffered psychological distress, and among diabetics variables associated with suffering a mental disorder and psychological distress were female sex, younger age, worse self-rated health, comorbidity, GP visit in the last 4 weeks and ER attendance in last year.

Al-Mandhari, Al-Zakwani, Al-Hasni and Al-Sumri (2011) in a related study assessed the impact of diabetes mellitus and hypertension as well as other demographic and clinical characteristics on perceived health status in primary health centers in Oman using a cross-sectional retrospective. Findings from the study demonstrated that the presence of both diabetes mellitus and hypertension was associated with lower physical scores compared to those with diabetes alone but only marginally lower than those with hypertension alone. Further analysis also showed no significant differences across the disease groups in mental scores. However, in terms of the demographic characteristics, age was negatively correlated but male gender, married, literate and higher income were all associated with higher physical

scores. Additionally, longer disease duration was associated with lower physical scores. However, male gender, marriage and higher income were associated with higher mental scores. The findings from this study just point to the fact that individual characteristics to a large extent influence disease or illness outcomes (physical and mental) significantly and must be explored in the management of the illness.

Shakya, Maskey, Sharma and Karki (2012) carried out a hospital-clinic based prevalence study to determine the prevalence of psychiatric disorders in diabetic patients receiving treatment. Among 200 clinic diabetes patients, 136 (68%) had GHQ-12 score of 2 or more, i.e. "psychiatric caseness". By alternate scoring, 15 (7.5%) had severe (25-36), 105 (52.5%) moderate (13-24), 71 (35.5%) mild (1-12) and the rest 9 (4.5%) had nil symptomatology. Among GHQ-12 items, "felt that you couldn't overcome your difficulties" was the most scored (39.0%), followed by "felt constantly under strain" (37.5%). It was concluded based on the outcome of the study that psychiatric problem is common among patients with diabetes. However, the study did not address or identified specific mental health problems but rather used a general health indicator to assess the diabetic patients' mental health.

In a similar vein, Guruprasad, Niranjand and Ashwin (2012) examined the association of depression, demographic and socio-medical factors in type 2 diabetes patients using cross-sectional and epidemiological study designs. Both physical and psychiatric examinations were done on the consenting diabetic patients attending to Medical OPD and symptoms of depression were screened for by using Beck depression inventory. Results from the analysis showed that one-fourth of the screened diabetic patients were found to be having depression, females and overweight individuals were found to have features of depression. In addition, patients with long duration of diabetes and on combination of antidiabetic drugs were significantly associated with depression. Among depressed diabetics 25.9% were having

Ischemic heart disease as a comorbid medical illness. The researchers however focused only on depression to the neglect of other equally challenging mental health problems.

Jadoon, Shahzad, Munir and Bashir (2012) found in their prevalence study that diabetic patients experience significant levels of depression and anxiety that qualify for clinical diagnosis. The levels of depression and anxiety were found to be significantly influenced by the diabetic patients' characteristics such as age, sex, marital status, exercise, employment status, income, smoking, locality and their level of glycemic control. The findings shed more light on the diabetes- mental health link but how the patients interpret their illness was not taken into consideration as illness perception has been found to significantly influence the level of psychological distress and mental health problems. This study outcome provide the basis for further studies as such personal characteristics may not play significant roles in other cultures and settings.

Rahimian-Boogar and Mohajeri-Tehrani (2012) investigated the risk factors for the incidence of depression in type 2 diabetic patients. In this descriptive cross-sectional study, 254 type 2 diabetic patients were selected through convenience sampling among diabetes outpatient clinics of Tehran University of medical sciences and also Iranian diabetes society during 2010-11. Increased pain and functional disability, decreased social support, decreased performance for diabetes self-care, longer duration of diabetes, diabetes complications, the need for insulin therapy, HbA1c>9%, BMI>25kg/m² and major life events were significantly different between the diabetic patients with and without depression, however, there was no significant difference in age, sex and socio-economic status between the two groups. The sample composition was not representative of the different types of diabetes mellitus.

2.3.2. Religiosity and Mental Health Outcomes

Several studies have been conducted on the effects of religiosity on the mental health of individuals with physical and psychological problems. A significant negative relationship has been established between level of religiosity and mental health problems (Koenig, McCullough, & Larson, 2001; Smith, McCullough, & Poll, 2003; Nelson, Jacobson, Weinberger, Bhaskaran, Rosenfeld, Breitbart et al., 2009).

Morse et al., (2000) conducted a study among African American women living with HIV/AIDS and found that public religious practice is related to lower engagement in high-risk health behaviours among HIV-infected and healthy women. This relationship was however not obtained for people with other chronic illnesses. It was further demonstrated that the higher the practice of public religiosity the better the physical health of the HIV infected women. However, public religiosity was negatively related to the CD4 counts of HIV infected women. The practice of private religiosity was not significantly related to the physical health of the women. The researchers also reported that sense of control was significantly and positively related to their religiosity. Results from this study support the important role religion plays for persons faced with chronic and terminal diseases, as in the case of HIV/AIDS. This study used correlations to establish relationships which do not tell us anything beyond these relationships and therefore, the conclusions from this are limited.

Similarly, a study by King, Mainous and Pearson (2002) found that religious service non-attenders with diabetes were more likely than attenders to have an elevated C-reactive protein. These findings highlight the protective factor of religiosity in the lives of chronically ill patients. This is because as religious attendance was associated with an elevated CRP, it can be seen as beneficial because the diabetic patients get support both material and non-material

from other members of the congregation. However, religious attendance in itself may not represent the actual religiosity of the patients as attendance is not a guarantee of religiosity.

Baetz, Griffin, Bowen, Koenig, and Marcoux (2004) examined data from a large epidemiologic survey to determine the relationship of religious practice (worship service attendance), spiritual and religious self-perception, and importance (salience) to depressive symptoms. Logistic regression was used to examine the relationship of the religious/spiritual variables to depressive symptoms while controlling for demographic, social, and health variables. More frequent worship service attendees had significantly fewer depressive symptoms. From this study, the role of religion in psychopathology can be seen as a positive one as it serves to protect the people. It is observable that spirituality/religion has an important effect on depressive symptoms, but this study underscores the complexity of this relationship. However, measuring religiosity by attendance is limited in that attendance of religious service may not be a guarantee of spirituality or religiosity.

Edmondson et al., (2005) investigated the roles of spirituality and religiosity in self-reported physical health, and determined whether there is an association between an individual's spirituality and cardiovascular responses to two Stressors. In terms of the sample of the study, fifty-two females took part in both a betrayal interview and a structured interview, during which blood pressure and heart rate were monitored. The finding from the data analysis indicated that spirituality was associated with perceived stress, subjective well-being, and medication use. Also, the Existential Well-being subscale predicted fewer physical health symptoms and was associated with lower mean heart rate and decreased heart rate reactivity. Further results showed that the Religious Well-being subscale was associated with reduced systolic blood pressure reactivity in response to the structured interview suggesting that spirituality may have a salutary effect on health, even in a fairly young sample. However, this

study did not find strong support for the popular reports that religion, as well as spirituality has a health protective effect and the researchers concluded that religiosity in this age group may still be undergoing developmental maturity. Such conclusions however may not be appropriate in countries or cultures where it is unthinkable to decouple religion and spirituality.

In related study, Baetz, Bowen, Jones and Koru-Sengul (2006) explored the relationships among spiritual values worship attendance and psychiatric disorders among Canadians. The demographic characteristics were controlled and the researchers determined odds ratios for lifetime, 1-year, and past psychiatric disorders, with worship frequency and spiritual values as predictors. It was revealed that higher worship frequency was associated with lower odds of psychiatric disorders. In contrast, those who considered higher spiritual values important (in a search for meaning, in giving strength, and in understanding life's difficulties) had higher odds of most psychiatric disorders. The outcome contradicts earlier studies that found religiosity to cushion people against mental health problems.

Miller, McConnell and Klinger (2007) in a related study to determine the influence of spirituality, religiosity, and religious coping on quality of life and self-efficacy among couples following a first time cardiac event sampled 44 patients with their partners who were first-time referrals to a 12-week cardiac rehabilitation program. The results showed that there is no significant association between measures for spirituality and religiosity and couples' ratings for quality of life and self-efficacy. Also, negative forms of religious coping were associated with lower levels of quality of life and decreased confidence in the patient's ability to perform physical tasks. Spouses' measures for quality of life, self-efficacy, spirituality, religiosity, and religious coping were associated with patients' measures for the same study variables. However, the outcomes of the study are limited by the fact that there was no control group to

actually give a clear effect of the various independent variables and the sample was also small with majority of the patients being males.

Kilbourne, Cummings and Levine (2009) examined the influence of religiosity on depression among low-income people with diabetes in a mid-sized southern city in the US. The cross-sectional design was employed in which the study focused on a combined clinical and community samples of people with diabetes from low-income neighbourhoods. Results from the analysis using a bivariate correlation and hierarchical linear regression revealed inverse associations between four of the five dimensions of religiosity and level of depression, that is, prayer, religious reading, religious attendance, and religious belief proved protective against depressive symptoms. Findings from the study also showed that though religious discourse correlated with the other measures of religiosity, engaging in religious discourse was not distinctly associated with levels of depression. The analyses suggest that religious resources increase psychological resiliency among those managing the chronic stress of diabetes.

A qualitative study by Abdoli, Ashktorab, Ahmadi, Parvizy, and Dunning (2011) using in-depth interviews among diabetic patients showed that negative diabetes perception, prolonged stress, poor healthcare, illiteracy and poverty were the main barriers to diabetes empowerment. The researchers also reported that empowerment among the diabetic patients is associated with hopefulness, self-efficacy, diabetes education and fear of complications. Further, the levels of diabetic patients' religious faith and social support were the main facilitators of diabetes management. These findings provide an in-depth understanding of how diabetic patients perceive their illness what they considered to facilitate or derail the management of the illness.

However, unlike previous studies that focused on either religious attendance or the levels of religiosity of the people, other researchers have focused on comparing the types of religion

and their impact among type-2 diabetic patients. For instance, How, Ming, and Chin (2011) found in their study that general religiosity has a significant negative relationship with fasting plasma glucose but not glycosylated haemoglobin which is consistent with other earlier works (e.g. Baetz et al., 2006; Edmondson et al., 2005). In terms of the types of religion, Christians and non-religious groups had significantly lower glycosylated haemoglobin compared to Muslims. These findings are new in the religion literature as the various faiths were compared and the significant differences provide health professionals with the requisite knowledge in attending to clients of diverse religious background. However, cultural differences in the population limit the extent to which the findings can be generalized.

In a related study, it was demonstrated by Park, Hong, Park and Cho (2012) among the general population in Korea that compared to Atheists, Catholics had a risk for depression. For anxiety among the population, Catholics and Protestants were at a higher risk compared to Atheists. However, Atheists were found to have a higher prevalence of alcohol problems compared to Protestants. On the other hand, religiosity was found to be positively related to mental health problems. This significant positive relationship could be due to the fact that in difficult moments people may tend to rely more on religion and spirituality thereby resulting in this association (Baetz et al., 2006; Kendler, Gardner, & Prescott, 1999). However, the use of only one question to examine spirituality is inadequate as more aspect of spirituality can have varied effects on mental health problems. In addition, religiosity in this was narrowed and limited to just the Christian populations which limits the extent to which results are applicable to other religious categories.

2.3.3. Illness Perception and Health Outcomes

Illness perceptions of patients have been studied on several outcome variables including both physical and psychological health outcomes. This is because the individual sufferer's

meaningful interpretations and the beliefs concerning the illness in question affect his or her attitude to self-care and other health-related behaviors. For instance some studies have demonstrated significant influences of illness perceptions on several health outcomes across illnesses including both physical and psychological conditions. Some of these studies are reviewed in the following section below.

Fortune, Richards, Griffiths and Main (2002) examined the relative contribution of medical variables, illness perceptions, coping and alexithymia to the variance in stress, distress and disability in patients with psoriasis using a cross-sectional study design. A group of 225 patients with psoriasis completed the Hospital Anxiety and Depression Scale (HADS), The Penn State Worry Questionnaire (PSWQ), the COPE, the Illness Perception Questionnaire (IPQ), Toronto Alexithymia Scale (TAS-20), and two measures specific to psoriasis, the Psoriasis Disability Index (PDI), and the Psoriasis Life Stress Inventory (PLSI). The severity of patients' psoriasis was clinically assessed by dermatologists on the Psoriasis Area and Severity Index (PASI). Results showed that in general, demographic variables, clinical history and extent of disease were consistently the least useful variables in terms of explaining variance in stress, distress or disability. The researchers reported that the utility of the aforementioned variables was limited to accounting for small but significant variations in disability, but even in this case, they accounted for just over half as much variance as illness perceptions. Illness perception was found to be the most significant predictor of the health outcomes among the study sample. The outcome of the study demonstrated the powerful influence of illness perception on the health outcomes in patients living with chronic conditions.

Additionally, Moss-Morris, and Chalde (2003) investigated the strength of chronic fatigue syndrome (CFS) patients' negative illness perceptions by comparing illness perceptions and

self-reported disability in patients with CFS and rheumatoid arthritis (RA). Seventy-four RA patients and 49 CFS patients completed the Illness Perception Questionnaire- Revised and the 36-item Short-Form Health Survey. It was demonstrated that when compared to the RA group, the CFS group attributed a wider range of everyday somatic symptoms to their illness, perceived the consequences of their illness to be more profound and were more likely to attribute their illness to a virus or immune system dysfunction. Both groups reported equivalent levels of physical disability but the CFS group reported significantly higher levels of role and social disability. The researchers concluded that although the symptoms of CFS are largely medically unexplained, CFS patients have more negative views about their symptoms and the impact that these have had on their lives than do patients with a clearly defined and potentially disabling medical condition.

Rees, Fry, Cull and Sutton (2004) in their study examined the associations between perceptions of breast cancer and distress in women at increased risk of breast cancer, and a comparison sample with no experience of the disease in their social environment. The study outcome indicated that women at increased risk of breast cancer showed comparable levels of general distress but significantly higher levels of cancer specific distress than the comparison group. Few differences were found in illness perceptions between the two samples, although a number of cognitive perceptions of breast cancer were related to both general and cancer specific distress in the increased risk sample, but not in the comparison sample. The researchers however, did not examine how the patients' perception of their illness is associated with their distress.

Barnes, Moss-Morris and Kaufusi (2004) in a study, examined whether there are cultural differences in the way in which Tongan and European people with Type 2 diabetes conceptualize their illness and treatment. The researchers also assessed the relationships

between patients' illness and treatment perceptions and their adherence to self-care regimens. The respondents completed either a Tongan or English version of a questionnaire, which included standardized measures of personal beliefs about diabetes and medication, and self-reported adherence. Information about the severity of patients' diabetes was obtained from patients' notes. Comparisons of glycosylated haemoglobin levels showed that Tongan patients had significantly poorer control over their diabetes than did European patients and were also significantly more likely than European patients to perceive their diabetes as acute and cyclical in nature, uncontrollable, and caused by factors such as God's will, pollution in the environment, and poor medical care in the past. Tongan patients perceived less necessity for medication, and exhibited higher emotional distress related to their diabetes. The beliefs that characterized the Tongan patients tended to be associated with poorer adherence to diet and medication taking. The outcomes of this research indicate the powerful influence of culture in shaping an individual's perception and beliefs because perceptions and beliefs about something or an issue are culturally constructed.

In order to provide an examination of the relationship between psychosis perceptions, coping strategies, appraisals, and distress in the relatives of patients with schizophrenia, Fortune, Smith and Garvey (2005) indicated that carers who viewed their relative's psychosis as chronic, who had a stronger illness identity (experience of symptoms), who held a stronger belief in the severity of its consequences, and who reported weaker beliefs in treatment control but stronger beliefs that their relative could exert control over their condition had higher distress scores. Coping through seeking emotional support, the use of religion/spirituality, active coping, acceptance, and positive reframing were associated with less distress, while coping through self-blame was associated with higher distress scores. The findings provide an insight into the influence of religion and illness perception on distress.

To examine illness representations and psychological distress in patients undergoing coronary artery bypass graft surgery, Hermele, Olivo, Namerow and Mehmet (2007) examined 56 patients awaiting CABG surgery using the Profile of Mood States (POMS) and the Illness Perception Questionnaire-Revised (IPQ-R). The researchers found in their study that patients' perceptions of their illness as chronic were associated with reduced beliefs in both personal control over illness and efficacy of treatment, and increased perceived consequences of illness in terms of life functioning. It was also found that psychological distress regarding illness was significantly correlated with psychological distress in general. Reduced illness coherence was also associated with increased psychological distress. This outcome of illness coherence being associated with psychological distress points to the fact that an individual's understanding of the illness plays a significant role in their health outcomes and as such, the researchers concluded that preoperative psycho-education aimed at helping patients better understand their illness, treatment, and its effects may reduce psychological distress and perhaps improve future well-being.

Furthermore, illness perception has been studied across a wide range of conditions and for that matter Knibb and Horton (2008) examined the influence of illness perception and coping strategies on the levels of psychological distress among allergy sufferers. The researchers reported that coping strategies and illness perception significantly predicted the levels of psychological distress among the patients. Importantly, perception of identity and emotional response were found to predict psychological distress but were mediated by coping. Though this study contributed significantly to the illness perception literature, the outcomes cannot be generalized as there were relatively more females than males in the study as well as a low response rate. Similarly, the measure of perception used was limited to only few dimensions as a recent measure of illness perception contain more domains and is very brief in assessing illness perception across illnesses (Broadbent et al., 2006).

Furthermore, Petriček et al., (2009) explored the influence of illness perception of type 2 diabetes mellitus on their levels of control over relevant cardiovascular risk factors and found that illness perception components such as perceptions of concern, personal control and concern, treatment control, and understanding of the diabetes were significant predictors of body mass index, fasting blood glucose, total cholesterol and blood pressure respectively. Therefore, the perceptions or views held by these type-2 diabetic patients significantly affected some of their health outcomes; giving credence to the fact the individual's cognitive appraisal of the illness is important.

Jørgensen, Frederiksen, Boesen, Elsass, and Johansen (2009) conducted an exploratory study of associations between illness perceptions and adjustment and changes after psychosocial rehabilitation in survivors of breast cancer. Results indicated no differences in the change of illness perceptions and the level of psychological adjustment observed between the three groups of survivors between baseline and one and six months of follow-up. Baseline analyses showed that illness perceptions were associated with distress and quality of life. This study indicates that illness perceptions are associated with adjustment and also illness perception predicted distress significantly providing support for the self-regulation model.

Evans and Norman (2009) sought to examine cross-sectional and prospective associations between illness representations, coping and psychological distress, and test the hypothesis that coping would mediate any relationships between illness representations and psychological distress. Patients with PD (n=58) completed the Illness Perception Questionnaire-Revised, the Medical Coping Modes Questionnaire and the Hospital Anxiety and Depression Scale. Patients (n=57) were followed-up at 6 months and the results showed that Illness representations explained large amounts of variance in time 1 anxiety and depression as well as additional variance in time 2 anxiety and depression after controlling for baseline scores. In

addition, avoidance mediated the effect of emotional representations on time 1 anxiety, and acceptance-resignation mediated the effects of both consequences and emotional representations on time 1 depression. The examination of the illness perception components in this study is very helpful as it allows for specific conclusions to be drawn in relation to how the illness perception components predict specific mental health problems.

Heyhoe and Lawton (2009) investigated the illness perceptions of patients with interstitial cystitis(IC) and their experience of psychological distress using the Revised Illness Perceptions Questionnaire (IPQ-R). The extent to which this measure adequately captures the illness representations of this group was also evaluated through semi-structured interviews. The results from the study using Pearson's correlation revealed that illness identity, consequences, illness coherence, emotional representations and psychological, risk factor and accident and injury attributions were associated with psychological distress. Further analysis employing MANOVA indicated that illness perceptions differed between severely and non-severely distressed patients, but not between patients with more or less severe symptoms. Moreover, the content analysis of patient interviews suggested that some aspects of the emotional experience of IC may not yet be adequately captured in the IPQ-R. Findings indicated that illness perceptions of patients' with IC are associated with psychological distress but the use of correlation does not provide any meaningful specific linkages.

Paddison, Alpass and Stephens (2010) conducted a study among sample of Type 2 diabetic patients by examining the relationships between illness perceptions and illness-related distress among adults with Type-2 diabetes randomly selected as the respondents. Data were collected through a mailed questionnaire survey and review of medical records. The Problem Areas in Diabetes (PAID) scale was used primary outcome which is diabetes-related psychological distress. Multiple regression analyses controlling for age, clinical characteristics, and mental

health showed that illness perceptions accounted for 15% of differences in distress about diabetes. However, poor mental health and illness severity alone do not explain differences in diabetes-related emotional adjustment and the authors concluded that 'making sense' of diabetes may be central to successfully managing the emotional consequences of diabetes. The contribution of illness perceptions to distress was relatively small and suggests that other equally important factors that could affect distress among patients were not considered.

In a study among diabetic patients, illness and treatment perceptions were found to be associated with several health-related outcomes such as insulin adherence, antihypertensive and cholesterol medications, diet and exercise (Broadbent, Donkin, & Stroh, 2011). It was also demonstrated that insulin adherence and perceived personal control predicted blood glucose control among type-1 diabetic patients while antihypertensive drug and perceived personal control predicted blood glucose levels of type-2 diabetic patients. Unlike previous studies that focused on only one type of diabetes to the neglect of others, this study's strength lies in using both types of diabetes.

Among patients with recurrent symptomatic Atrial Fibrillation, McCabe, Barnason and Houfek (2011) investigated the relationship between illness beliefs and self-management. The patients in the study perceived Atrial Fibrillation as chronic and unpredictable with serious consequences. In terms of the perceived causes of the illness, the patients believed that psychological factors, age, and heredity caused Atrial Fibrillation and reported that Atrial Fibrillation induced worry, anxiety, and depression. Stronger beliefs about Atrial Fibrillation as cyclic, unpredictable, having psychological causes, and greater consequences were associated with more negative emotion. However, the participants who reported a good understanding of Atrial Fibrillation endorsed fewer negative emotions related to Atrial Fibrillation held stronger beliefs that Atrial Fibrillation was controllable with treatment, and

appraised Atrial Fibrillation as less serious with fewer negative consequences. The outcomes lend support to the earlier findings of how illness perception influences health outcomes.

Dempster et al., (2011) investigated the extent to which illness cognitions and coping explain psychological distress among family carers of survivors of oesophageal cancer. Results from the analysis of their data the variables in the study explained almost half of the variance in the level of psychological distress among the respondents. In terms of the predictive powers of the individual illness perception components, it was found that the perceptions of the cause, consequences and personal control over oesophageal cancer and the carer's understanding of the condition were significant predictors of psychological distress. Psychological distress was also explained significantly by positive focus coping strategies. This therefore, demonstrates the importance of the illness perception and coping on the level of psychological distress.

Yuniarti et al., (2013) conducted a study among type -2 diabetes patients in Indonesia to examine diabetes in relation to illness perception, stress, depression, social support, and self-management. The quantitative approach, employing 68 participants, aged between 40–75 years old was used. Results from their analysis revealed that social support did not mediate the relationship between self-acceptance and depression among patients. There was a significant negative relationship between religiosity and stress and self-acceptance mediated the relationship. It was also discovered that illness perception and coping strategies were not having a direct association with self-management in general and therefore, the predictive impact of the illness perception was minimal and does not resonate with previous studies (e.g. Paddison, Alpass & Stephens, 2010; Jørgensen et al., 2009; Rees, Fry, Cull & Sutton, 2004; Heyhoe & Lawton, 2009; Knibb & Horton, 2008; Dempster et al., 2011). The authors concluded that there could be multicollinearity among 8 sub-components of illness perception, coping strategies and self-management.

2.4. Summary of the Literature Review

The Self-Regulatory Model (Leventhal, Meyer & Nerenz, 1980), The Strength Model of Self Control (Baumeister, Vohs & Tice, 2007), Health belief Model (Rosenstock, 1966) and Religious Coping theory (Pargament, 1997) provided the theoretical bases for this study. Each of the models was explained in the light of how they explain the variables in the study. The Self-Regulatory Model, The Strength Model of Self-Control and the Health Belief Model explained the perception of the diabetes by the diabetic patients and the Religious Coping theory explained the importance of religious faith in influencing the health outcomes of diabetic patients.

The review of the relevant studies was done by examining the prevalence of psychiatric morbidities of diabetes and how personal characteristics of the patients influence these outcomes. In general, diabetes has been found to be associated with several psychiatric morbidities including depression, anxiety, psychological distress, sexual dysfunctions and cognitive impairments among others. However, most of the studies were focused on depression (Lin & von Korff, 2008; Hermanns et al., 2005; Lin et al., 2004), anxiety (Tuncay et al., 2008; or general psychological distress (Peyrot et al., 2005; Paddison, 2010). Some of these studies have demonstrated that demographic characteristics such as age, sex, duration of illness, education, employment status and, marital status significantly affect psychiatric morbidity while others did not find such effects.

The role of religiosity in mental and physical health was reviewed with some studies (e.g. King, Mainous & Pearson, 2002; Baetz et al., 2004; Kilbourne, Cummings & Levine, 2009; Park et al., 2012; Abdoli et al., 2011; How, Ming & Chin, 2011) demonstrating a consistent pattern of religiosity serving as a protective factor against development of mental health and physical health problems. That is, the more religious an individual, the less likely he/she is to

develop mental health problems. This is due to the fact that religiosity provides people with meaning and comfort and most especially social support from others within their religious settings. However, some studies (e.g. Edmondson et al., 2005; Miller, McConnell & Klinger, 2007) have also not demonstrated such protective ability of the individuals' religiosity in that it sometimes predisposes people to mental health problems. Thus, the influence of religiosity on mental health problems still remains relatively inconclusive.

Finally, studies on the influence of illness perception on mental health and illness outcomes were reviewed with majority demonstrating a consistent pattern across illnesses and health outcomes. For instance, illness perception has been showed to be significantly associated with psychological distress in diabetes (Paddison, Alpass & Stephens, 2010), breast cancer (Jørgensen et al., 2009; Rees, Fry, Cull & Sutton, 2004), interstitial cystitis (Heyhoe & Lawton, 2009), allergy sufferers (Knibb & Horton, 2008) and oesophageal cancer (Dempster et al., 2011). In the same vein, illness perception was showed to have demonstrated a significant influence on cardiovascular risk factors (Petriček et al., 2009) as well as other health outcomes thereby showing the consistency of the self-regulation theory in predicting health outcomes across illnesses.

2.5. Rationale for the present Study

From the studies that have been reviewed, majority (e. g. Rees, Fry, Cull & Sutton, 2004; Knibb & Horton, 2008; Heyhoe & Lawton, 2009; Paddison, Alpass & Stephens, 2010; Dempster et al., 2011) seemed to have focused on how illness perception influence psychological distress but not specific mental health problems and therefore, makes it difficult in determining the impact of the illness perceptions on specific psychological disorders. Similarly, most of the studies (e.g. McCabe, Barnason & Houfek, 2011; Dempster et al.,

2011; Heyhoe & Lawton, 2009; Evans & Norman, 2009) reviewed on illness perception focused on other conditions with not much attention given to diabetes mellitus.

With regard to diabetic studies in Ghana, the few available are mainly prevalence studies that are concerned with estimation of number of people suffering from diabetes and the medical complications (Darkwa, 2011; Adubofour, Ofei, Mensah-Adubofour & Owusu, 1993), illness experience and action (De-Graft Aikins, 2003), with no such studies addressing the mental health problems that are likely to be experienced by diabetic patients. Additionally, religion is a central part of most Ghanaians (Gyekye, 1996) and can influence the wellbeing of the individual but paucity in literature on diabetes and its associated factors create the opportunity for a formal study to ascertain how personal religious faith can influence mental health of diabetic patients.

2.6. Statement of Hypotheses

Based on the studies reviewed above, the following hypotheses were tested:

1. There will be a significant negative relationship between diabetic patients' religiosity and mental health problems
2. There will be a significant positive relationship between Illness Perception of diabetic patients and their mental health problems
3. The diabetic patients' perception of illness coherence is likely to account for more variance in mental health problem (GSI) than the other illness perception components.
4. The diabetic patients' perception of illness coherence is likely to account for more variance in their level of depression than the other illness perception components.

5. The diabetic patients' perception of illness coherence is likely to account for more variance in their level of anxiety than the other illness perception components.

6. Demographic characteristics (sex, age, education and duration) of diabetic patients will significantly moderate the relationship between;

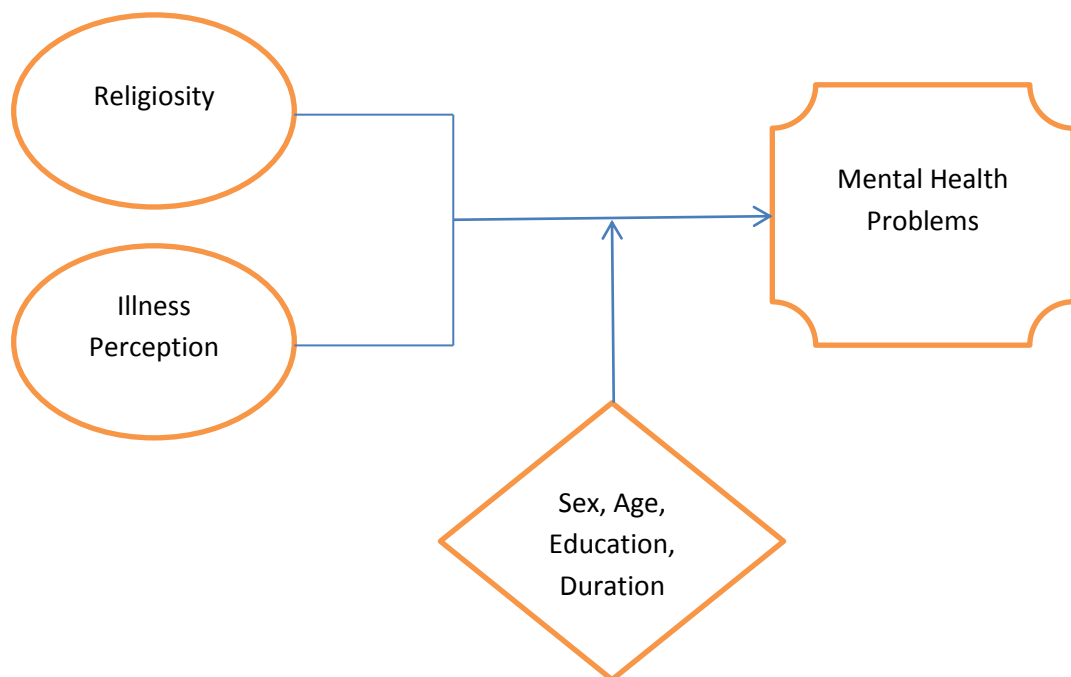
a. Religiosity and Mental Health Problem (GSI).

b. Illness Perception and Mental Health Problem (GSI).

7. Female diabetic patients are likely to experience higher mental health problems compared to male diabetic patients.

Figure 2.1

Hypothesised Model



In this model, religiosity and Illness perception of diabetic patients are assumed to be significantly related to and predict mental health problems. These relationships are assumed to

be significantly moderated by demographics characteristic of diabetic patients such as sex, age, education and duration of illness.

2.7. Operational Definitions

Mental Health Outcomes: *These include the patients' reported experience of Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation and Psychoticism*

Religiosity: *This refers to personal religious faith of the individual not specific to any religion*

Illness Perception: *This refers to the interpretation given to diabetes mellitus in terms of the diabetes being benign or severe*

Illness Perception Components: *These include perceptions of Consequences, Duration, Personal Control, Treatment Control, Symptoms, Concern, Coherence, Emotional Response and Perceived Causes*

CHAPTER THREE

METHODOLOGY

3.1. Introduction

This chapter presents all that went to the actual conduct of the study in terms of the research setting/population, sample and sampling technique, the design, measures as well as the procedures involved in the data collection process. This section details the steps that were taken in gathering evidence to test the stated hypotheses.

3.2. Population

The population of interest in this study was all diabetic patients attending a health facility, seeking treatment for diabetes in the Greater Accra region of Ghana. This population was chosen because the Greater Accra region is the capital of Ghana and comprises of people from all parts of the country. As a result, the various sections of the population cut across in terms of health and illness. The Korle-Bu Teaching Hospital, Ridge Hospital and Tema General Hospital were the centres of interest since they serve as the referral points in the various Municipalities. However, the Ridge hospital was not used as there were no patients during the strike action by the medical doctors. For the Korle-Bu teaching hospital, their diabetic unit is a research centre and thus made it possible for diabetes-related researches.

3.3. Sample/ Sampling Technique

The sample of this study was made up of one hundred and ninety four (194) which represents 97% of the estimated sample size of 200 diabetic patients. This sample size selection was based on the minimum sample size determination offered by Field (2009) taking into consideration the effect size as well as the statistical power at which the effects would be

detected. This applies to performance of multiple regression analysis and the minimum sample sizes are listed below;

For a medium effect size and high level of statistical power (.80) with 10 predictors, a minimum of 150 sample size is required. For a medium effect size and high level of statistical power (.80) with 20 predictors, a minimum of 200 sample size is required. From this sample size determination therefore, the sample size of 194 is sufficient for multiple regression analysis to be performed in order to obtain a medium effect size and a high statistical power .8.

These 194 diabetic patients were sampled from the Tema General and Korle-Bu Teaching Hospitals respectively by using the convenient sampling technique. The convenient sampling technique was used in sampling the respondents for the study because the number of diabetic patients available was relatively few compared to the general patient population at the two hospitals. The characteristics of the respondents in the study are summarized in the table 1 below:

Table 1***Demographic Characteristics of the Diabetic Patients in the Study***

Characteristic	N (%)
Gender	
Male	46 (23.7%)
Female	148 (76.3%)
Age Categories	
20-29 years	6 (3.1%)
30-39 years	10(5.2%)
40-49 years	29(14.9%)
50-59 years	60(30.9%)
Above 60 years	89(45.9%)
Marital Status	
Single	20(10.3%)
Married	117(60.3%)
Separated/divorced,	17(8.8%)
Widowed	40(20.6%)
Education	
No Formal Education	22(11.3%)
Primary	98(50.5%)
Secondary	52(26.8%)
Tertiary	22(11.3%)
Religion	
Christianity	176 (90.7%)
Islam	16 (8.2%)
Others	2 (1.0%)
Type of Diabetes	
Type-1	50 (25.8%)
Type-2	144 (74.2%)
Duration of Illness (Mean)	8.69(<i>SD</i>=7.30)

3.3.1. Inclusion Criteria:

Below are the criteria for inclusion of the patients in the study;

1. Must be 20 years and above.
2. Being an out-patient for a year and above.
3. Be willing to participate voluntarily.

3.3.2. Exclusion Criteria

Below are the criteria for exclusion of diabetic patients from taking part in the study;

1. Below the age of 20 years
2. Being an in-patient.
3. Decline to voluntarily participate in the study

3.4. Measures/Instruments

The variables in the study were measured by the used of inventories and questionnaires and these measures are presented into detail in the following sections below;

3.4.1. *Brief Illness Perception Questionnaire* (Broadbent, Petrie, Main, & Weinman, 2006):

This is a nine-item which measures patients' cognitive and emotional representations of their illness including their perceptions of illness consequences, duration, personal control, treatment control, symptoms, coherence, concern, emotional response, and causes. Examples of items include 'How much control do you feel you have over your illness? (Personal control), 'How long do you think your illness will continue? (Timeline) and 'How much does your illness affect your life?'(Consequence). The causal item was open ended to allow respondents to indicate what they thought caused their illness. A Cronbach alpha of .70 was reported for the scale. This scale also demonstrated good concurrent validity with relevant

measures, predict validity and discriminate validity (Broadbent, Petrie, Main, & Weinman, 2006). An overall illness perception score is computed to determine whether the illness is viewed as benign or threatening, the authors suggested that items 3, 4, and 7 should be reverse scored and added to items 1, 2, 5, 6, and 8. A higher score reflects a more threatening view of the illness.

3.4.2. *Santa Clara Strength of Religious Faith Questionnaire (Plante & Boccaccini, 1997)*

This questionnaire is a ten-item questionnaire which measures an individual's level of religious faith. Some examples of items in scale are 'I pray daily,' 'I look to my faith as a source of inspiration,' and 'I look to my faith as providing meaning and purpose in my life'. This scale has a Likert response format of 4-points including; '1 = strongly disagree' '2 = disagree' '3 = agree' '4 = strongly agree'. Studies that have investigated the internal consistency of the scale have found corrections ranging from 0.94 to 0.97 using Cronbach Alpha's and split-half reliability scores ranging from 0.90 to 0.96 (Plante & Boccaccini, 1997). The total religiosity score was obtained for each respondent by adding the responses on all the ten items with a maximum score of 40 and a minimum score of 10 with higher scores representing a higher level of religiosity and vice versa.

3.4.3. *Brief Symptom Inventory (Derogatis, 1993)*

The Brief Symptom Inventory is a 53-item self-report symptom inventory designed to reflect the psychological symptom patterns of psychiatric and medical patients and non-patients. This inventory reports profiles of nine primary symptom dimensions and three global indices of distress (Derogatis, 1993). The symptom dimensions included; Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation and Psychoticism. The responses are on a 5-point scale, from 0 = "not at

all", to 4 = "extremely". The BSI also has high internal consistency (Cronbach's alpha: 0.71-0.85), test retest reliability, and convergent, discriminant, and construct validity.

3.4.4. Pilot Study

A pilot study was conducted prior to the main study to determine the reliability of the scales employed in the study. This pilot study was conducted by administering the scales to 20 diabetic patients receiving an out-patient care at the Tema General Hospital. The Cronbach alpha (Internal Consistency) was run for each scale and their respective sub-scales. The results of the internal consistency measures are summarised in the Table 2 below;

Table 2

Internal Consistencies of the Scales from a Pilot study of 20 Diabetic Patients

SCALE	Cronbach Alpha (Internal Consistency)
Religiosity	.72
Brief Illness Perception (BIP)	.66
Brief Symptom Inventory (BSI)	.89
<u>BSI Sub-Scales</u>	
Somatization	.80
Obsessive-Compulsive	.69
Interpersonal Sensitivity	.62
Depression	.70
Anxiety	.78
Hostility	.69
Phobic Anxiety	.70
Paranoid ideation	.58
Psychoticism	.69

From Table 2 above, the Religiosity scale has a Cronbach alpha value of .72, the Brief Illness Perception Scale has a Cronbach alpha value of .66 and the Brief Symptom Inventory has a Cronbach alpha value of .89. For the nine sub-scales of the BSI, Cronbach alpha values ranged between .58 and .80. These reliability values are presented in the Table 3.2 above

3.5. Design

Since the study sought to obtain self-report information about diabetic patients' opinions, perceptions, beliefs and attitudes, the most appropriate design for this study is the cross-sectional survey.

3.6. Procedure

For the procedure, an Ethical clearance was obtained from the Institutional Review Board of the Noguchi Memorial Institute for Medical Research, University of Ghana, Legon. A letter of introduction from the Department of Psychology and the Ethical clearance certificates were sent to the Greater Accra Regional Health Directorate for permission to use the Ridge and Tema General Hospitals. The approval letters from the regional health directorate were sent to the hospitals for introduction as well as permission. After, the permission was granted at the Tema General Hospital, a date was fixed for the commencement of the data collection. For the Korle-Bu Teaching Hospital, a Diabetes Research Form was completed in addition to the Ethical clearance certificate, Research Proposal and Departmental introduction letter were sent to the Head of the Diabetic Clinic at Korle-Bu for approval and permission. After the approval a date was fixed for the data collection.

Two research assistants were recruited for the data collection and were given training on the administration of the questionnaires. The out-patients departments of the hospitals were used for the data collection. On the days of the data collection, the researchers were introduced to the patients waiting to see their doctors after which the researcher and the two assistants engaged the patients individually. The patients were given the consent form to write their names and sign or make a mark indicating their voluntary participation. The respondents who could read and write were administered the questionnaires in a pen-and paper form. Those

who could not were interviewed by following the questions on the questionnaires. During the data collection, those who could not finish were given the chance to go and their questionnaires were not included in the analysis. The data collection at the Tema General Hospital lasted for 2 weeks and that of the Korle-Bu Teaching Hospital lasted for 3 weeks. The completed questionnaires were then sorted out for analysis.

CHAPTER FOUR

RESULTS

4.1. Introduction

This chapter presents the results from the analyses of the data by summarizing the key findings in appropriate tables. The SPSS 16.00 was used in analyzing the data and series of statistical tests were used including descriptive statistics to summarize the data. The main inferential statistical tests that were used to analyze each hypothesis are discussed with reasons. The discussion of the tests is followed by detailed presentations of tables with their interpretations. The key findings are summarized and the additional findings that are not part of the main hypotheses were also highlighted briefly.

4.2. Data Analyses

Hypotheses 1 & 2 were analyzed using the Pearson correlation because the variables (Religiosity and Mental Health Problem, Illness Perception and Mental Health Problem) were measured at least on an interval scale and assumed to be linearly related. The hypotheses 3, 4, & 5 were tested with multiple regression analysis because illness perception components (Consequences, Duration, Personal Control, Treatment Control, Symptoms, Concern, Coherence and Emotional Response) were regressed on mental health problem (GSI), depression and anxiety respectively. Hierarchical regression analysis was used for hypothesis 6a&b in order to test for the moderation effects of diabetic patients' demographic characteristics on the relationships between Religiosity and Mental Health Problem, Illness Perception and Mental Health Problem. The final hypothesis (7) was analyzed with MANOVA because sex differences were compared across ten dependent variables

(Somatization, Obsessive-Compulsion, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic-anxiety, Paranoid Ideation, Psychoticism and Global Severity Index.

4.3. HYPOTHESES TESTING

To test the first and second hypotheses, the Pearson correlation was done and the results are summarized in the correlation matrix Table 3 below;

Table 3

Correlation Matrices of Illness Perception, Religiosity and Mental Health Problems of Diabetics

VAR	1	2	3	4	5	6	7	8	9	10	11
REL											
PERC	-.13*										
SOM	.06	.20**									
OC	.07	.13*	.58**								
SEN	.08	.08	.51**	.47**							
DEP	.05	.15*	.52**	.54**	.60**						
ANX	.10	.19**	.66**	.59**	.54**	.54**					
HOS	.03	.10	.50**	.51**	.54**	.57**	.45**				
PHO	.05	.11	.43**	.56**	.46**	.52**	.61**	.35**			
PAR	.07	-.06	.29**	.26**	.47**	.31**	.24**	.35**	.25**		
PSY	.08	.12*	.37**	.43**	.57**	.60**	.41**	.45**	.42**	.50**	
GSI	.09	.22**	.74**	.74**	.73**	.75**	.77**	.67**	.66**	.50**	.67**

**= Significant at .01 alpha level, *= significant at .05 alpha level. REL=Religiosity, PERC=Illness Perception, SOM=Somatization, OC=Obsessive-Compulsion, SEN=Interpersonal Sensitivity, DEP=Depression, ANX= Anxiety, HOS=Hostility, PHO=Phobic-anxiety, PAR= Paranoid Ideation, PSY= Psychoticism and GSI= Global Severity Index.

Hypothesis One: *There will be a significant negative relationship between diabetic patients' religiosity and mental health problems.*

From the correlation matrix Table 3 above, it was observed that religiosity does not significantly correlate with the Global Severity Index (general mental health problem), $r(192) = .09, \rho > .05$. Further analysis showed no significant relationships between religiosity and specific mental health problems, that is, Somatization; $r(192) = .06, \rho > .05$, Obsessive-Compulsion; $r(192) = .07, \rho > .05$, Interpersonal Sensitivity; $r(192) = .08, \rho > .05$, Depression; $r(192) = .05, \rho > .05$, Anxiety; $r(192) = .10, \rho > .05$, Hostility; $r(192) = .03, \rho > .05$, Phobic Anxiety; $r(192) = .05, \rho > .05$, Paranoid Ideation; $r(192) = .07, \rho > .05$, and Psychoticism $r(192) = .08, \rho > .05$. Therefore, the hypothesis one that there will be a significant negative relationship between diabetic patients' religiosity and mental health problems is not supported.

Hypothesis Two: *There will be a significant positive relationship between Illness Perception of diabetic patients and their mental health problems.*

From the correlation matrix 3 above, a significant positive relationship was obtained between illness perception and Global Severity Index (general mental health problem), $r(192) = .22, \rho < .01$. Further analyses showed that illness perception correlated significantly with five (Somatization, Obsessive-Compulsion, Depression, Anxiety and Psychoticism) of the mental health problems, that is, Somatization, $r(192) = .20, \rho < .01$, Obsessive-Compulsion, $r(192) = .13, \rho < .05$, Interpersonal Sensitivity, $r(192) = .08, \rho > .05$, Depression, $r(192) = .15, \rho < .05$, Anxiety, $r(192) = .19, \rho < .01$, Hostility, $r(192) = .10, \rho > .05$, Phobic Anxiety, $r(192) = .11, \rho > .05$, Paranoid Ideation, $r(192) = -.01, \rho > .05$, and Psychoticism, $r(192) = .12, \rho < .05$. Therefore, the hypothesis that there will be a significant positive relationship between Illness Perception of diabetic patients and their mental health problems is supported.

Hypothesis Three: *The perception of illness coherence will significantly predict the mental health problem (GSI) of diabetic patients than the other illness perception components.*

To test this hypothesis, a multiple regression analyses using the ENTER method was done to find out how the various components of the illness perception predict the mental health problems (Global Severity Index) among diabetic patients. A significant model emerged at the .001 alpha level, [$R^2 = .33$, $F(8,185) = 11.16$, $\rho < .001$]. That is, the entire model explained about 33% of variance in the level of general mental health problem (GSI) among diabetic patients. The contributions of each of the illness perception components in explaining the variance in general mental health problem are summarised in the table 4 below:

Table 4

Multiple Regressions of the contributions of the Components to Global Severity Index

Predictors	B	SEB	β	t	ρ
Consequences	.01	.01	.06	.81	.417
Duration	.02	.01	.10	1.50	.135
Personal Control	.00	.02	.00	.01	.990
Treatment Control	.00	.02	.01	.08	.933
Symptoms	.06	.02	.27	3.89	.000
Concern	.03	.01	.17	2.46	.015
Coherence	-.05	.01	-.33	-4.92	.000
Emotional Response	.01	.01	.07	.97	.336

Predictors: *Consequences, Duration, Personal Control, Treatment Control, Symptoms, Concern, Coherence and Emotional Response.*

Dependent Variable: *Global Severity Index*

An examination of Table 4 above showed that the most significant illness perception component predictor of Global Severity Index is the perception of Coherence which

contributed negatively to 33% of variance in Psychological Distress at the .01 alpha level, [$\beta = -.33, t = -4.92, \rho < .01$]. The second most significant predictor of psychological distress (GSI) was the perception of Symptoms of the illness which contributed positively to 27% of variance in Psychological Distress at the .01 alpha level, [$\beta = .27, t = 3.89, \rho < .01$]. The third most significant predictor of general psychological distress (GSI) was perception of Concern about the illness which contributed positively to 17% of variance in Psychological Distress at the .05 alpha level, [$\beta = .16, t = 2.46, \rho < .05$]. The other illness perception components did not predict the level of psychological distress (GSI) significantly as showed in the multiple regressions Table 4 above. Thus, the third hypothesis that perception of illness coherence will significantly predict the mental health problem (GSI) of diabetic patients than the other illness perception components is supported.

Hypothesis Four: *The perception of illness coherence will significantly predict the level of depression among diabetic patients than the other illness perception components.*

The multiple regression was done and a significant model emerged at the .001 alpha level, [$R^2 = .27, F(8, 185) = 8.55, \rho < .001$]. That is, the entire model explained about 27% of variance in the level of depression among diabetic patients. The contributions of each of the illness perception components in explaining the variance in the level of depression are summarised in the table 5 below:

Table 5*Multiple Regression of the contributions of illness perception components to depression*

Predictors	B	SEB	β	t	ρ
Consequences	.01	.01	.07	.88	.379
Duration	.02	.01	.14	2.00	.047
Personal Control	.01	.02	.03	.35	.728
Treatment Control	.00	.02	.00	.03	.973
Symptoms	.04	.02	.16	2.16	.032
Concern	.01	.01	.06	.83	.407
Coherence	-.05	.01	-.30	-4.28	.000
Emotional Response	.04	.01	.21	2.71	.007

Predictors: Consequences, Duration, Personal Control, Treatment Control, Symptoms, Concern, Coherence and Emotional Response.

Dependent variable: Depression

From the Table 5 above, it was observed that the most significant illness perception component in predicting the level of depression among diabetic patients is the perception of illness coherence, [$\beta = -.30$, $t = -4.28$, $\rho < .001$]. This was followed by the perception of emotional response, [$\beta = .21$, $t = 2.71$, $\rho < .01$], perception of symptoms of the illness [$\beta = .16$, $t = 2.16$, $\rho = .05$] and perception of duration, [$\beta = .14$, $t = 2.00$, $\rho < .05$] respectively. The perceptions of consequences, personal control, treatment control and concern did not however, account for any significant variance in the level of depression among diabetic patients. Therefore, the hypothesis that the perception of illness coherence will significantly predict the level of depression among diabetic patients than the other illness perception components is supported.

Hypothesis Five: *The perception of illness coherence will significantly predict the level of anxiety among diabetic patients than the other illness perception components.*

The multiple regression was done and a significant model emerged at the .001 alpha level, [$R^2 = .25$, $F(8,185) = 7.50$, $\rho < .001$]. That is, the entire model explained about 25% of variance in the level of anxiety among diabetic patients. The contributions of each of the illness perception components in explaining the variance in the level of anxiety are summarised in the table 6 below:

Table 6

Multiple Regression of the contributions of illness perception components to Anxiety

Predictors	B	SEB	β	t	ρ
Consequences	.01	.02	.03	.34	.738
Duration	.02	.02	.11	1.53	.129
Personal Control	-.02	.03	-.05	-.59	.554
Treatment Control	-.01	.03	-.03	-.35	.729
Symptoms	.07	.02	.24	3.22	.002
Concern	.02	.02	.11	1.53	.128
Coherence	-.07	.02	-.29	-4.16	.000
Emotional Response	.01	.02	.04	.53	.597

Predictors: Consequences, Duration, Personal Control, Treatment Control, Symptoms, Concern, Coherence and Emotional Response.

Dependent variable: Anxiety

An examination of Table 6 above showed that the most significant illness perception of anxiety among diabetic patients is the perception of illness coherence which explained 29% of variance in anxiety, [$\beta = -.29$, $t = -4.16$, $\rho < .001$]. This was followed by the perception of symptoms which explained 24% of variance in Anxiety, [$\beta = .24$, $t = 3.22$, $\rho < .01$]. The

perceptions of consequences, duration, personal control, treatment control, concern and emotional response did not significantly predict the level of anxiety among diabetic patients. Therefore, the hypothesis that the perception of illness coherence will significantly predict the level of anxiety among diabetic patients than the other illness perception components is supported.

Hypothesis Six: *Demographic characteristics (sex, age, duration of illness and education) will significantly moderate the relationship between;*

a. Religiosity and Mental Health Problem (GSI)

b. Illness Perception and Mental Health Problem (GSI)

The hypotheses 6a is not supported as there was no significant relationship between diabetic patients' level of religiosity and mental health problem (GSI), $r(192) = .09, \rho > .05$. Therefore, there was no need for further moderation analysis as suggested by Barron and Kenny (1996) that, to test for moderation effect, the predictor and criterion variables should be related significantly.

To determine whether diabetic patients' demographic characteristics significantly moderate the relationship between illness perception and mental health problem (GSI), a hierarchical regression was done using the ENTER method and the results are summarized in the Table 7 below:

Table 7**Multiple regression of the moderation effects of demographic characteristics between illness perception and Global severity index**

Model	B	SEB	β	t	ρ
Step 1					
Constant	.14	.15		.91	.363
Illness Perception	.01	.00	.22	3.11	.002
Step 2					
Constant	-.17	.32		-.53	.594
Illness Perception	.02	.00	.26	3.66	.000
Sex	.23	.09	.19	2.51	.013
Age	.02	.04	.03	.44	.658
Education	-.09	.05	-.15	-1.98	.049
Duration of Illness	.00	.01	-.02	-.33	.739
Step 3					
Constant	-.18	.33		-.56	.577
Illness Perception	.02	.00	.27	3.71	.000
Sex	.22	.09	.18	2.36	.019
Age	.02	.04	.04	.54	.588
Education	-.09	.05	-.15	-1.94	.053
Duration of Illness	.00	.01	-.04	-.47	.640
Perception*Sex	.03	.04	.06	.68	.499
Perception*Age	-.01	.04	-.01	-.18	.856
Perception*Education	-.02	.05	-.03	-.35	.726
Perception*Duration	.03	.04	.06	.75	.455

Dependent Variable: Global Severity Index. $R^2 = .04, .12, .13$ and $\Delta R^2 = .05, .07, .01$ for Steps 1, 2 & 3 respectively.

It was observed from the table 7 above that illness perception accounted for 22% of variance in mental health problem (GSI), ($\beta = .22, t = 3.11, \rho < .01$). Sex of diabetic patients explained 19% of variance in mental health problem (GSI), ($\beta = .19, t = 2.251, \rho < .05$) and the levels of education of diabetic patients negatively accounted for 15% variation in mental health problem (GSI), ($\beta = -.15, t = -1.98, \rho < .05$). However, diabetic patients' age, education and duration of illness did not account for any significant variance in mental health problem (GSI). It was further observed that none of the demographic characteristics significantly moderated the relationship between illness perception and mental health problem (GSI).

Therefore, the hypothesis that diabetic patients' demographic characteristics (sex, age, duration of illness and education) will significantly moderate the relationship between Illness Perception and Mental Health Problem (GSI) is not supported.

Hypothesis Seven: *Female diabetic patients are more likely to experience higher mental health problems compared to male diabetic patients.*

To test this hypothesis, the multivariate analysis of variance (MANOVA) was used since two independent groups of males and females are being compared on ten dependent variables being measured at least on an interval scale. The assumptions underlying the MANOVA (Covariance and Homogeneity) were violated and therefore, the Pillai's Trace was used, [$F(10,183) = 1.82, \rho > .01$, Pillai's Trace = .09, partial eta squared = .091]. The MANOVA results are summarised in the Table 4.6 below;

Table 8

MANOVA of Sex Differences and Mental Health Problems among Diabetic Patients

Variables	Male	Female	df	F	ρ	η^2
Somatization	.88	1.21	1, 192	4.17	.042	
Obsessive- Compulsion	.45	.86		10.97	.001	.054
Interpersonal Sensitivity	.33	.59		4.19	.042	
Depression	.24	.46		5.83	.017	
Anxiety	.24	.57		6.96	.009	
Hostility	.23	.46		5.02	.026	
Phobic-Anxiety	.13	.42		9.22	.003	.046
Paranoid Ideation	.72	.81		.65	.422	
Psychoticism	.27	.29		.07	.790	
Global Severity Index	.41	.65		7.92	.005	.040

α - level = .005 since there are ten dependent variables

Since there are ten dependent variables, the Bonferroni adjustment was done to reduce type-I error by dividing the .05 alpha level by ten in order to adopt a more stringent alpha level. Thus, the new alpha level for these F- ratios is .005. An examination of the MANOVA table 8 above showed that, a significant sex difference was observed in the level of general mental health (GSI) experienced by male and female diabetic patients with female patients reporting higher psychological distress, $F(1, 192) = 7.92, \rho < .005$, and a small effect size of $\eta^2 = .040$. For the specific mental health problems, sex had a significant influence on the level of obsessive-compulsion among the diabetic patients, $F(1, 192) = 10.97, \rho < .005$, a small effect size of $\eta^2 = .054$, with females experiencing more obsessive-compulsion than males. A significant sex difference was found between male and female diabetic patients in their level of phobic-anxiety with females experiencing more phobic-anxiety than males, $F(1, 192) = 9.22, \rho < .005$, a small effect size of $\eta^2 = .046$. However, no significant sex differences were observed between male and female diabetic patients in their levels Somatization, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Paranoid Ideation, and Psychoticism. Therefore, the hypothesis that female diabetic patients are likely to experience higher mental health problems compared to male diabetic patients is supported.

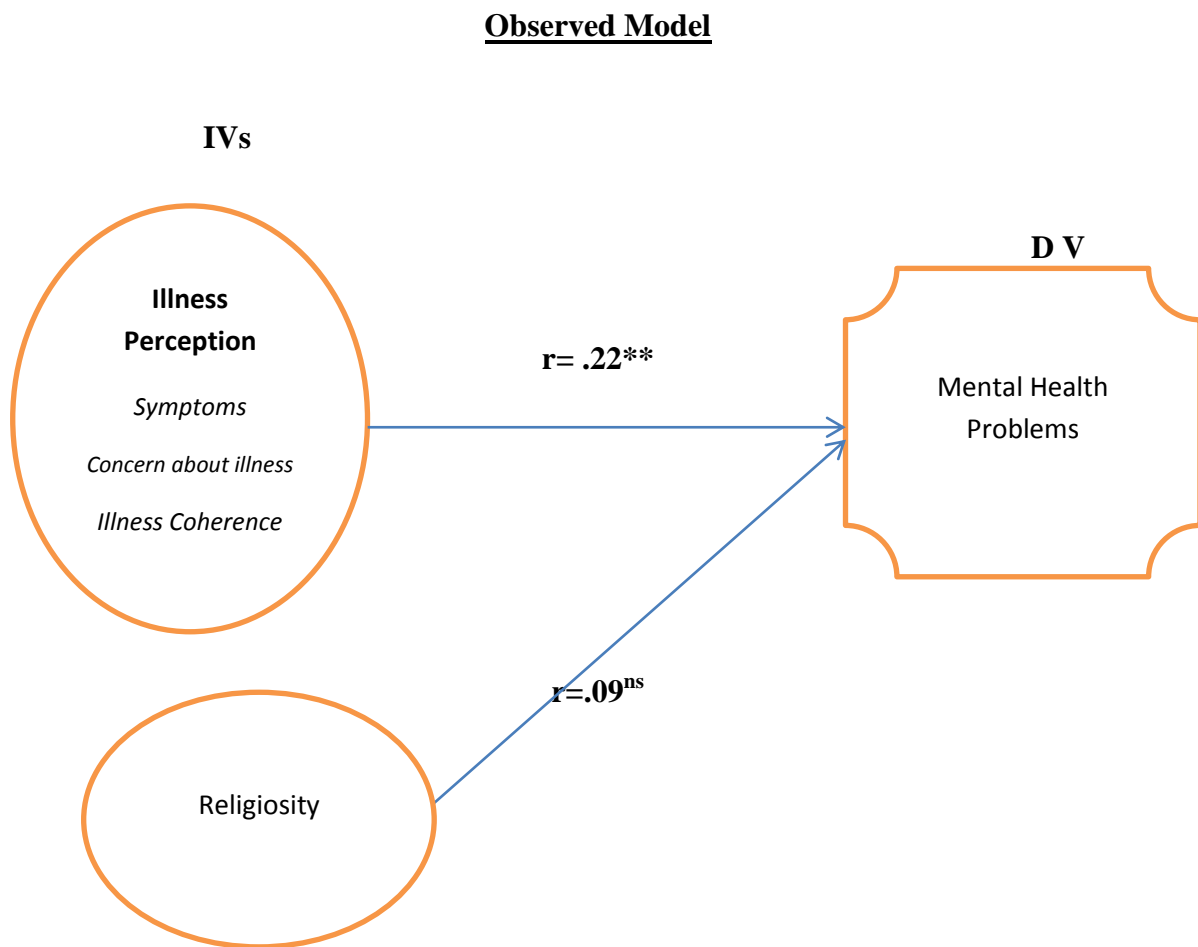
4.4. Summary of Findings:

- I. The level of religiosity of the diabetic patients did not significantly influence their experience of mental health problems.
- II. Illness perception of the diabetic patients is significantly and positively related to their general mental health problems (GSI) as well as specific mental health problems, Somatization, **Obsessive-Compulsion, Depression, Anxiety and Psychoticism.**
- III. Perception of illness coherence was the most significant predictor of general mental health problem (GSI), Depression and Anxiety.

- IV. None of the diabetic patients' demographic characteristics (sex, age, duration of illness and education) moderated the relationships between religiosity and mental health problems as well as illness perception and mental health problems.
- V. Female diabetic patients experienced significantly higher levels of Obsessive-Compulsion, Phobic-Anxiety and Psychological Distress than male diabetic patients.

4.5. Additional Findings: Illness Perception Components and Specific Mental Health Problems (Appendix G)

- I. The perceptions of Illness Coherence and Symptoms significantly predicted the diabetic patients' levels Somatization, Obsessive-Compulsion and whiles only perception of Coherence predicted Interpersonal Sensitivity.
- II. The level of Hostility experienced by the diabetic patients was significantly predicted by the perceptions of illness Coherence, Concern and Emotional Response.
- III. The level of Phobic-Anxiety experienced by the diabetic patients was significantly predicted by the perceptions of illness Duration and Coherence.
- IV. The level of Paranoid-Ideation experienced by the diabetic patients was not significantly predicted by any of the illness perception components.
- V. The level of Psychoticism experienced by the diabetic patients was significantly predicted by the perception of illness Concern, Symptoms and Coherence.

Figure 4.1

The model showed that illness perception significantly relates to mental health problems. Only three of the illness perception components significantly predicted the level of general mental health problems. However, the level of religiosity of persons living with diabetes did not significantly relate with their general mental health problems. These findings are diagrammatically illustrated in the figure 4.1 above.

CHAPTER FIVE

DISCUSSION

5.1. Introduction

This chapter presents the findings from the study with regards to whether the stated hypotheses have been confirmed or not. The findings from the study are discussed with reference to previous studies and theories reviewed in the subject area. The explanations of the findings are offered to put the outcomes into perspective in relation to culture and personality differences that may be accounting for the different results. The implications of the findings and the recommendations for future studies, practitioners, clients and the health sector are outlined. The limitations and conclusions are also spelt out in the light of the findings and their implications.

Diabetes mellitus as a condition is associated with several mental health issues and as result, this study sought to determine the factors that are associated with the likelihood of mental health problems. Specifically, the study sought to examine the influences of diabetic patients' perception of their illness and their level of religiosity on their mental health problems and whether their demographic characteristics moderated these relationships.

The diabetic patients receiving care at the diabetic units in the Greater Accra Region of Ghana were the population. Patients reporting at the Korle-Bu Teaching hospital and the Tema General hospital for health care services were selected as the sample for this study. These hospitals serve as the largest referral points for all other surrounding health facilities and they also serve people with a wide variety of illnesses. The sample included both males and females across all age categories and the two types of the diabetes (Types 1 & 2).

Religiosity and Mental Health Problems among Diabetic Patients

To examine whether the level of religiosity of diabetic patients relates significantly with diabetic patients' mental health problems, correlation was done and the results showed that the level of religiosity is not significantly related to the mental health problems of the diabetic patients and therefore did not predict any of the mental health problems experienced by the diabetic patients significantly. The lack of a significant relationship between the levels of diabetic patients' religiosity and their mental health problems is likely due to the fact that this sample (persons with diabetes) differs from other samples that reported significant associations between religiosity and mental health problems. Again, the one-dimensional nature of the religiosity could serve as a limitation in capturing the various facets of religiosity that could be significantly associated with mental health problems among persons with diabetes. Additionally, though religiosity did not correlate significantly with mental health problems, it correlated significantly with illness perception which also influenced mental health problems. Thus, the effect of religiosity on mental health problems could be through illness perception.

This finding is inconsistent with earlier studies that showed significant influences of religiosity on several aspects of health including elevated C-reactive protein among diabetic patients (King, Mainous & Pearson, 2002), depression (Baetz et al., 2004; Kilbourne, Cummings & Levine, 2009; Park, et al., 2012), empowerment (Abdoli et al., 2011), glycaemic control among diabetic patients (How, Ming & Chin, 2011). In all these previous studies, the level of religiosity was found to have significant influences on these outcomes among different samples in different countries by serving as a protective factor against health problems.

However, the non-significant influence of the level of religiosity on the mental health problems is consistent with some previous works such as that of Edmondson et al., (2005) in their study of religiosity and physical health and found no strong support for the popular reports that religion, as well as spirituality has a health protective effect. Similarly, Miller, McConnell and Klinger (2007) also found no significant association between measures for spirituality and religiosity and couples' ratings for quality of life and self-efficacy. This therefore showed that the influence of religiosity in mental health outcomes is relative and not always as protective as reported by some studies.

Illness Perceptions and Mental Health Problems

Further, to examine whether illness perception of diabetic patients significantly relates with their levels of mental health problems, it was observed that significant positive relationships exist between illness perception and general mental health problem (GSI). Illness perception was also found to be significantly related to some specific mental health problems such as levels of Somatization, Obsessive-Compulsion, Depression and Anxiety. This is because when the diabetes is perceived as threatening, it is likely to induce certain emotional feelings that are usually negative leading to the individual becoming depressed, anxious and psychologically distressed. That is, the cognitive appraisal of the illness generates emotional, physiological and behavioral reactions that negatively influence the mental and physical health of the individual living with diabetes mellitus.

The finding of a significant influence of illness perception on the levels of somatization, depression, anxiety, and psychological distress among diabetic patients is consistent with previous works on illness perception and health outcomes. For instance, illness perceptions accounted for most variance in health outcomes compared to demographic variables, clinical history and extent of disease (Fortune, Richards, Griffiths & Main, 2002). Similarly, illness

perception significantly predicted distress among cancer sufferers (Rees, Fry, Cull & Sutton, 2004), distress among allergy sufferers (Knibb & Horton, 2008), anxiety and depression among Parkinson's disease patients (Evans & Norman, 2009), psychological distress among patients with interstitial cystitis(IC) (Heyhoe and Lawton, 2009). In the same vein, Paddison, Alpass and Stephens (2010) found illness perception to have predicted diabetes-related distress significantly. Thus, illness perception significantly influences certain specific mental health problems significantly than the level of religiosity of the diabetic patients.

Illness Perception Components and Mental Health Problem (GSI) among Diabetic Patients

To determine whether perception of illness coherence predicts mental health problems significantly than the other illness perception components, it was observed that the mental health problem (GSI) experienced by the diabetic patients was significantly predicted by perception of illness coherence, followed by perceptions of symptoms and concern respectively. This outcome was demonstrated by several research findings such as the ones by Dempster et al., (2011), Paddison, Alpass and Stephens (2010), Heyhoe and Lawton (2009) and Knibb and Horton (2008), where illness perception components predicted psychological distress significantly.

The perceived understanding of the diabetes resulted in a significant decrease in the level of mental health problem (GSI) among diabetic patients. This finding is consistent with previous works by Hermele et al., (2007) that reduced illness coherence results in psychological distress and that, "understanding" of the illness was a significant predictor of blood pressure among Type-2 diabetic patients (Petriček et al., 2009). This finding could be due to the fact that if there is an understanding of the diabetes, worrying and fears surrounding the diabetes reduces as the patient will be in a position to appreciate the causes, symptoms and treatment

options. The perceived symptoms and concern about diabetes increased the level of psychological distress among diabetic patients significantly. That is, when the diabetic patients perceive several many symptoms associated with their disease, their levels of mental health problems increase. This can attributed to the fact that the diabetic patients might not understand and appreciates the symptoms that accompany the illness and thereby interpreting them as threatening which predispose them to mental health problems. Similarly, perception of being very much concern about the illness predicted mental health problems of diabetic patients. This could be attributed to the fact that as the patients become preoccupied with the thoughts of living with diabetes and it associated problems their level of mental health problems increase.

Illness Perception Components and level of Depression among Diabetic Patients

The level of depression experienced by diabetic patients was significantly predicted by perceptions of illness coherence followed by emotional response, symptoms and duration respectively. That is, when there is a better understanding of the illness, the level of depression decreases as perception of illness coherence accounted for a significant decrease in the level of depression. This is because when the individual understands the illness, it is easier in to cope in terms of treatment and the management of the condition. This finding supports previous findings that reduced illness coherence predisposes the individual to experience depression (Leventhal, Leventhal & Cameron, 2001; Hermele et al., 2007).

Similarly, the emotional response to the illness that is, being sad or angry results in higher levels of depression among diabetic patients. The perception of many severe symptoms was also associated with higher levels of depressions as the experience of more symptoms by the patients results in emotional reactions such as sadness which predispose the individual to depression. In the same vein, perceived duration was found to significantly predict the level of

depression which means that as the individual perceives diabetes to last forever, the level of depression also increases. However, a perception of a shorter duration of diabetes is associated with lower levels of depression among diabetic patients. This implies that thoughts about how long the illness will last play a significant role in the emotional reactions to diabetes by diabetic patients. Similar findings were documented by Heyhoe and Lawton (2009) and Evans and Norman (2009) that emotional representation predicted the level of depression.

Illness Perception Components and level of Anxiety among Diabetic Patients

More so, the level of anxiety experienced by the diabetic patients was significantly predicted by perception of illness coherence followed by perception of symptoms respectively. That is, when the individual perceives that s/he understands the illness, the anxiety associated with the illness decreases significantly. Thus, when the individual has an insight into the illness and how to manage it very well, the fear associated with diabetes is likely to be reduced significantly. In terms of the symptoms, perception of many severe symptoms results in anxiety as many symptoms signify diabetes-related complications which could even result in amputation. Thus, when the diabetes patients perceive more symptoms they are predisposed to the experience of anxiety which can interfere with their treatment regimen.

This finding concurs with the work of Petriček et al., (2009) that the understanding of diabetes was associated with high blood pressure which can induce the feeling of anxiety. Similar findings were reported by Dempster et al., (2011), McCabe, Barnason and Houfek (2011) and Paddison, Alpass and Stephens (2010). Diabetes as an illness has several symptoms and complications which when not well understood could be major sources of worry and fear among diabetic patients thereby highlighting the significance of perception of illness coherence in predicting anxiety among diabetic patients.

Moderation effects of diabetic patients' demographic characteristics on relationships between Religiosity, Illness Perception and Mental Health Problem (GSI)

To determine whether sex, age, level of education and duration of illness of diabetic patients significantly moderated the relationships between religiosity on one hand, illness perception on another hand and mental health problem (GSI), it was showed that these variables did not moderate the relationships significantly. The lack of significant moderation effects could be attributed to the fact that the demographic characteristics in exception of sex and education did not predict mental health problem significantly. That is, these demographic characteristics neither strengthen nor weaken the relationship between illness perception and mental health problem thereby implying that these demographic variables are less significant in influencing the course of mental health problems among diabetic patients.

However, this non-significant finding is inconsistent with previous works that demonstrated significant main effects of these demographic characteristics on mental health problems. For instance, Hermanns et al., (2005) reported that younger age was risk factor for affective disorders among a sample of diabetic patients in Germany. It was also found that younger diabetic patients report more psychological and mental health problems (Paddison, 2010; Jimenez-Garcia et al., 2011; Jadoon et al., 2012). Similarly, significant differences were observed in mental health problems as a factor of sex, diabetes duration and educational status (e.g. Guruprasad, Niranjand & Ashwin, 2012; Rahimian-Boogar & Mohajeri-Tehrani, 2012; Jimenez-Garcia et al., 2011; Al-Mandhari, Al-Zakwani, Al-Hasni & Al-Sumri, 2011).

Sex Differences and Mental Health Problems among Diabetic Patients

Since sex was found to be a significant predictor of mental health problems, a further analysis was done to determine whether significant sex differences exist between male and female diabetic patients in their general mental health problem and levels of specific mental health such as somatization, obsessive-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic-anxiety and psychological distress. The results showed that female diabetic patients reported significantly higher mental health problems (Global Severity Index) than male diabetic patients. Significant sex differences were also observed between male and female diabetic patients on their specific mental health problems with females reporting higher levels of obsessive-compulsion and phobic-anxiety than males.

These findings are consistent with earlier research outcomes that demonstrated that the female sex predisposes diabetic patients to mental health problems. For instance, it was reported among diabetic patients that suffering a mental disorder and psychological distress were associated with female sex (Jimenez-Garcia et al., 2011; Guruprasad, Niranjana & Ashwin, 2012; Hermanns et al., 2005). Other studies also reported sex differences among diabetic patients in their levels of reported physical and mental health with male sex being a contributing factor (Al-Mandhari, Al-Zakwani, Al-Hasni & Al-Sumri, 2011).

These significant sex differences could be attributed to cultural influences that do not permit males to show signs of weakness and therefore, may tend to under report their mental health problems. Additionally, women are usually burdened with house chores, childcare, family and work-related issues which put them under pressure thereby resulting in poorer mental health outcomes compared to their male counterparts. Similarly, the experience of menopause and child birth issues with their accompanying stress could also be a contributing factor in these

significant sex differences found between male and female diabetic patients in their experience of mental health problems.

However, no significant sex differences were obtained between male and female diabetic patients in some specific mental health problems such as somatization, interpersonal sensitivity, depression, anxiety, hostility, paranoid ideation and psychoticism. This finding is inconsistent with the work of Bener, Al-Hamaq and Dafeeah (2011) that diabetic women had higher depression, anxiety, and stress scores than diabetic men. On the other hand, the insignificant findings are consistent with previous studies that did not any significant difference between males and females (e.g. Rahimian-Boogar & Mohajeri-Tehrani, 2012).

These insignificant findings in some specific mental health problems could be due to the fact that male and females may be experiencing similar symptoms and complications and as such interpret their condition similarly. The changing patterns of responsibility sharing at the home where women are no longer burdened with all the chores and childcare could also explain this insignificant finding between male and female diabetic patients in their specific comorbid mental health problems.

Perceived Causes of Diabetes among Diabetic Patients in Ghana

The perceived causes of an illness to a large extent determine the actions that are taken to manage and treat the illness. Sometimes the perceived causes can arouse certain emotional and physical reactions to the illness. From this study, the perceived causes of diabetes mellitus were categorized into four namely; Biological, Psychological, Supernatural and Lifestyle causes. These categorizations were based on the individual causal factors mentioned by the patients. Some examples of the biological causes mentioned include hereditary, menopause, hypertension, weak pancreas, surgical operations and other illnesses. Examples of

psychological causes indicated by the diabetic patients include anger, stress and excessive thinking (worry). Examples of the supernatural causes of diabetes mentioned by the patients include evil spirits, spiritual attack and punishment from God. Examples of lifestyle causes of the illness include eating habits, fatty and sugary foods, drinking alcohol, smoking and lack of exercise.

The analysis of these categories of the perceived causes of diabetes showed that majority of the diabetic patients associated their illness to lifestyle causes (73 cases) followed by biological factors (35 cases). These were followed by psychological (12) and supernatural (6) causes respectively. The rest of the respondents did not seem to know what caused their diabetes. These causal attributions to diabetes have implications for diabetes education and showed that the level of understanding of the diabetes still needs to be worked on as perceived understanding of the illness has been showed to predict a reduction in mental health problems among diabetes.

The findings of this study in terms of the perceived causes of the diabetes resonate with the previous work done in Ghana by De-Graft Aikins (2003) among diabetic patients which demonstrated that sugary foods, wealthy lifestyles, hereditary, pancreas malfunctioning and supernatural factors were thought to have caused diabetes. That is, majority in this study interpreted the disease in terms of eating habits, types of foods (especially sugary foods) and also the fact that the diabetes runs in their families and could also be bought for an individual by jealous friends and relatives.

5.2. Recommendations

The recommendations are categorized under (i) Future Studies, (ii) Health Professionals, (iii) Diabetic Patients and (iv) Health Sector.

Future Studies

As a recommendation for future studies, the sample selection should be done using the probability sampling technique to ensure the representativeness of the sample to the population of diabetic patients. Future studies should also examine the role of coping with the diabetes on the mental health outcomes of the patients. This study examined the mental health problems among diabetic patients and therefore, future studies should explore the healthy aspects and factors that predict the mental health among the patients. Also, future studies should explore other equally important psychological variables that could influence the mental health problems among diabetic patients since illness perception predicted about half of the variance in the level of mental health problems experienced by diabetic patients.

Health Professionals

The results from this study also have practical implications for mental health professionals. That is, in dealing with diabetic patients' mental health issues, key attention should be paid to their perceptions of diabetes as it was found that illness perception significantly predicted the level of mental health problems experienced by the patients. Thus, the diabetic patients' cognitive appraisal of their illness should be given enough attention aside other factors. This is because in majority of the mental health problems, the perception of understanding of the diabetes significantly reduced the mental health problems and conscious efforts must be made to ensure that the patients understand the diabetes to reduce the uncertainties surrounding the illness.

Further, the perceived causes of diabetes were mainly lifestyle and Psychoeducation in the area of diabetes should focus on these and other perceived causes as these perceptions are likely to influence avoidance of certain foods that may be beneficial to the patients and eating of certain foods that may be hazardous to their health. Mental healthcare professionals should not limit their assessment and treatment to only the commonly known comorbid mental health problems such as anxiety and depression but should go beyond these two as the study showed that symptoms of somatization, obsessive-compulsion, paranoid ideation and psychoticism among others were reported by the diabetic patients.

It was also found that male and female diabetic patients differ significantly in their level of mental health problem with females reporting more symptoms and therefore, should deserve attention in delivery of mental health services. Thus, clinicians should take note of these subtle differences when dealing with their clients. Similarly, the level of education of diabetic patients significantly predicted the general mental health problem among diabetic patients and therefore, clinicians should take into consideration the levels of education of their clients.

Diabetic Patients

Religiosity did not have any significant relationship with the mental health problems and as such too much dependent on religion may not be helpful in alleviating associated comorbid mental health problems of diabetes mellitus. Thus, instead of spending so much time and resources seeking religious and spiritual care, health professionals should be contacted for diabetes-related issues to be dealt with. That is not to say diabetic patients should avoid religious activities but too much emphasis on them to the neglect of proper holistic healthcare from professionals is what is recommended.

Additionally, as the results showed that the perception of understanding of the diabetes mellitus resulted in the reduction of majority of the mental health problems, it is recommended that diabetic patient should make conscious efforts to seek information from the health professional with regards to the causes, symptoms and the management of the illness. That is, patients should not rely on ‘hear-say’ and be fed with all sorts of misinformation about the disease. Diabetic patients should also be conscious of how they interpret their illness as the interpretation the individual ascribes to the illness significantly influences his/her mental health problems significantly.

Health Sector

The findings from this study that diabetes has several mental health complications have implications for the health sectors. The first recommendation to the health sector in Ghana is that the holistic approach should be adopted in the management of the diabetic condition. That is, an approach to health care delivery known as the bio-psychosocial approach involving healthcare professionals with varied expertise such as doctors, nurses, psychiatrists, clinical psychologists and dieticians among others. This is because the diabetes condition significantly affects the level of mental health among the patients and therefore, needs to be addressed by mental health specialists such as clinical psychologists. This is necessary because, outcome studies have demonstrated that comorbid mental health issues negatively affect the course of the diabetes management.

Additionally, it is recommended that health policy formulation should include access to mental healthcare in the management (treatment) regimen for the diabetic patients. This would enable the patients receive total care and lessen the burden on the few existing medical facilities. For instance, some patients may frequent health facilities with problems that may be psychological in nature and in turn be receiving medical treatment with no success. This can

lead to waste of resources that could have been used for patients who actually need the services. Similarly, it is recommended that health policy makers should consider the inclusion of the mental health services in the national health insurance scheme for persons living with diabetes so as to make it accessible to every diabetic patient.

5.3. Limitations of the Study

The study has some challenges and limitations that are worth mentioning. The first and foremost challenge was the time of the data collection which was virtually a striking period of the medical doctors in the country. This situational factor is seen as a possible extraneous variable that could influence the outcome of the study. That is, some patients were not willing to be part of the study as they were annoyed with the strike action. This also led to the second limitation which the use of the convenient sampling to select the respondents as a result of the few number of people willing to be part of the study. Therefore, the generalization of the study outcomes is somewhat limited. One other challenge was getting permission to conduct the study at the three proposed hospitals. Only two were able to grant the permission within the time available and thus limited the sample selection.

5.4. Conclusion

Living with diabetes has been shown to be accompanied by comorbid mental health problems such as depression, anxiety and psychological distress among others. However, little research exists to determine factors that could predict these mental health problems. This study examined the influence of illness perception and the level of religiosity on the mental health problems of diabetic patients. The outcome demonstrated that the level of religiosity did not significantly predict mental health problems as did by the illness perception of the patients.

No significant differences were found in the diabetic patients mental health problems per their demographic characteristics.

The perception of the diabetes mellitus as threatening predicted a significant increase in mental health problems such as somatization, depression, anxiety, and psychological distress among diabetic patients. Also, the various components of illness perception predicted majority of the mental health problems studied significantly. For instance, the perceived understanding of the illness predicted depression, anxiety, somatization, hostility, psychological distress, psychoticism and obsessive-compulsion among the diabetic patients significantly. Other components such as perceived duration, symptoms, consequences, and emotional response also predicted specific mental health problems significantly.

In a nutshell, the study outcomes serve as the bases for future studies as there are no or if any, few studies conducted in our Ghanaian context with regards to the mental health problems among diabetes. This is because this study has demonstrated that diabetic patients experience symptoms of mental health problems ranging from somatization, obsessive-compulsion, depression, anxiety, psychoticism and paranoid-ideation to phobic-anxiety. However, these diagnoses cannot be concluded to be clinically significant as more in-depth clinical assessment is required for such diagnoses.

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APPENDICES

Appendix A: QUESTIONNAIRES

SECTION A: DEMOGRAPHIC CHARACTERISTICS

Sex: Male () Female ()

Age: 20-29() 30-39() 40-49() 50-59() 60 and above ()

Marital Status: Single () Married () Separated/Divorced () Widowed ()

Religious Faith: Christianity () Islam () Others ()

Education: No Education () Primary () Secondary () Tertiary ()

Type of Diabetes: Type -1 () Type-2 ()

Duration of Illness (Years).....

SECTION B: SANTA CLARA STRENGTH OF RELIGIOUS FAITH QUESTIONNAIRE

Please answer the following questions about your religious faith in managing your diabetes mellitus using the scale below:

Indicate the level of agreement (or disagreement) for each statement.

1 = strongly disagree 2 = disagree 3 = agree 4 = strongly agree

_____ 1. My religious faith is extremely important to me.

_____ 2. I pray daily.

_____ 3. I look to my faith as a source of inspiration.

_____ 4. I look to my faith as providing meaning and purpose in my life.

_____ 5. I consider myself active in my faith or church.

_____ 6. My faith is an important part of who I am as a person.

_____ 7. My relationship with God is extremely important to me.

_____ 8. I enjoy being around others who share my faith.

_____ 9. I look to my faith as a source of comfort.

_____ 10. My faith impacts many of my decisions.

SECTION C: THE BRIEF ILLNESS PERCEPTION QUESTIONNAIRE

Using the scale below, tick your beliefs about diabetes mellitus:

1. How much does your illness affect your life?

0	1	2	3	4	5	6	7	8	9	10
No effect at all								severely affects my life		

2. How long do you think your illness will continue?

0	1	2	3	4	5	6	7	8	9	10
a very short time									forever	

3. How much control do you feel you have over your illness?

0	1	2	3	4	5	6	7	8	9	10
Absolutely no control							extreme amount of control			

4. How much do you think your treatment can help your illness?

0	1	2	3	4	5	6	7	8	9	10
not at all								extremely helpful		

5. How much do you experience symptoms from your illness?

0	1	2	3	4	5	6	7	8	9	10
no symptoms at all							many severe symptoms			

6. How concerned are you about your illness?

0	1	2	3	4	5	6	7	8	9	10
not at all concerned								extremely concerned		

7. How well do you feel you understand your illness?

0	1	2	3	4	5	6	7	8	9	10
don't understand at all							understand very clearly			

8. How much does your illness affect you emotionally? (e.g. does it make you angry, scared, upset or depressed?)

0 1 2 3 4 5 6 7 8 9 10

not at all affected emotionally extremely affected emotionally

9. Please list in rank-order the three most important factors that you believe caused your illness.

The most important causes for me:-

1. _____
2. _____
3. _____

SECTION D: BRIEF SYMPTOM INVENTORY (BSI)

Here is a list of problems people sometimes have. I want you to indicate how much that problem has distressed or bothered you during the past 7 days including today. On the right side are the answers I want you to use.

Appendix B: CONSENT FORM

Title: “**Illness Perception, Religiosity and Mental Health of Diabetic Patients in Ghana**”

Principal Investigator: Nuworza Kugbey

Principal Supervisor: Dr Samuel Atindanbila

Department of Psychology, University of Ghana, Legon

General Information about the Research:

The aim of this research is to examine whether the views held by diabetic patients about their illness in terms of cause, personal control, timeline etc. and religiosity have any significant influence on their mental health. Therefore, you will be required to respond each item on the questionnaire as truthfully as possible and there are no correct or wrong answers. The completion of the questionnaire could last from 20minutes to 45minutes depending on the individual participant. The Diabetic Units of the Korle-Bu Teaching Hospital, Ridge Hospital and Tema General Hospital will be the venues for the data collection.

Possible Risks and Discomforts:

There are no foreseeable risks in participating in this study. However, any discomforts experienced by any respondent as a result of his or her involvement in the study will be dealt with accordingly by means of psychotherapy or Psychoeducation after thorough individual assessment of the participant.

Possible Benefits:

The possible benefit may be indirect but the outcomes are likely to inform policy decision making that would shape the scope of diabetes management in Ghana in relation to dealing with the mental health issues which the respondents may be beneficiaries. This can help bring more health professional on board in the management of the diabetic condition.

Confidentiality:

Please be assured that no names or any other form of identity is required of you. Any information provided will be handled with care and used for academic purpose only.

Compensation:

There will be no material or direct compensation for participation in the study since the study will not take so much time and does not pose any danger to the respondents.

Voluntary Participation and Right to Withdraw:

Participation in this research is absolutely voluntary and you under no compulsion to take part. You may withdraw as you so wish at any point in the study. You may also choose not to answer specific questions.

Contacts for Additional Information:

In case of any doubt or/and for additional information concerning the study you may contact the Principal Investigator, Nuworza Kugbey, University of Ghana, Legon. Telephone: 0249377659 or email address: nkugbey@gmail.com.

Your rights as a Participant:

This research has been reviewed and approved by the Institutional Review Board of Noguchi Memorial Institute for Medical Research (NMIMR-IRB). If you have any questions about your rights as a research participant you can contact the IRB Office between the hours of 8am-5pm through the landline 0302916438 or email addresses: nirb@noguchi.mimcom.org or HBaidoo@noguchi.mimcom.org .

VOLUNTEER AGREEMENT

The above document describing the benefits and procedures for the research titled: **“Illness Perception, Religiosity and Mental Health of Diabetic Patients in Ghana”** has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

Date

Name and signature or mark of volunteer

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks and procedures were read to the volunteer. All questions were answered and the volunteer has agreed to take part in the research.

Date

Name and signature of witness

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

Date

Name and Signature of Person Who Obtained Consent

Appendix G: Multiple Regression Tables of Illness Perception Components and Specific Mental Health Problems.

Multiple Regression Results for the contributions of the Components to Somatization

Predictors	B	SEB	β	t	ρ
Consequences	.03	.02	.10	1.34	.184
Duration	.02	.02	.07	1.04	.301
Personal Control	-.05	.03	-.11	-1.51	.133
Treatment Control	-.01	.04	-.02	-.27	.791
Symptoms	.11	.03	.27	3.94	.000*
Concern	.02	.02	.06	.94	.350
Coherence	-.11	.02	-.35	-5.36	.000*
Emotional Response	.00	.02	-.01	-.09	.925

***Predictors:** Consequences, Duration, Personal Control, Treatment Control, Symptoms, Concern, Coherence and Emotional Response.*

***Dependent variable:** Somatization*

Multiple Regression of the contributions of the Components to Obsessive-Compulsion

Predictors	B	SEB	β	t	ρ
Consequences	.01	.02	.04	.52	.606
Duration	.03	.02	.12	1.74	.084
Personal Control	.02	.03	.05	.67	.507
Treatment Control	.01	.03	.02	.24	.813
Symptoms	.08	.02	.25	3.40	.001*
Concern	.02	.02	.10	1.39	.165
Coherence	-.09	.02	-.35	-5.03	.000*
Emotional Response	-.01	.02	-.05	-.65	.515

***Predictors:** Consequences, Duration, Personal Control, Treatment Control, Symptoms, Concern, Coherence and Emotional Response.*

***Dependent variable:** Obsessive-Compulsion*

Multiple Regression of the contributions of the Components to Interpersonal Sensitivity

Predictors	B	SEB	β	t	P
Consequences	-.01	.02	-.05	-.52	.607
Duration	.02	.02	.09	1.20	.234
Personal Control	.01	.03	.04	.50	.618
Treatment Control	.01	.03	.03	.38	.702
Symptoms	.05	.02	.15	1.88	.061
Concern	.03	.02	.15	1.93	.055
Coherence	-.07	.02	-.27	-3.58	.000*
Emotional Response	.02	.02	.08	1.01	.313

Predictors: Consequences, Duration, Personal Control, Treatment Control, Symptoms, Concern, Coherence and Emotional Response.

Dependent variable: Interpersonal Sensitivity

Multiple Regression Results for the contributions of the Components to Hostility

Predictors	B	SEB	β	t	ρ
Consequences	.00	.02	.01	.12	.906
Duration	.02	.01	.12	1.7	.091
Personal Control	.03	.02	.09	1.21	.226
Treatment Control	-.01	.03	-.02	-.28	.780
Symptoms	.03	.02	.10	1.38	.168
Concern	.03	.01	.18	2.42	.016*
Coherence	-.07	.01	-.34	-4.82	.000*
Emotional Response	.03	.02	.17	2.10	.037*

Predictors: Consequences, Duration, Personal Control, Treatment Control, Symptoms, Concern, Coherence and Emotional Response.

Dependent Variable: Hostility

Multiple Regression Results of the contributions of the Components to Phobic-Anxiety

Predictors	B	SEβ	Beta	t	ρ
Consequences	-.01	.02	-.07	-.84	.400
Duration	.03	.01	.16	2.03	.044*
Personal Control	.01	.02	.03	.33	.744
Treatment Control	.02	.03	.07	.913	.362
Symptoms	.03	.02	.14	1.82	.071
Concern	.02	.01	.14	1.76	.080
Coherence	-.03	.01	-.16	-2.04	.043*
Emotional Response	.02	.02	.11	1.27	.206

Predictors: Consequences, Duration, Personal Control, Treatment Control, Symptoms, Concern, Coherence and Emotional Response.

Dependent Variable: Phobic-Anxiety

Multiple Regression Results of the contributions of the Components to Psychoticism

Predictors	B	SEB	β	t	ρ
Consequences	.01	.01	.04	.41	.679
Duration	.00	.01	-.02	-.23	.822
Personal Control	.03	.02	.13	1.58	.117
Treatment Control	-.01	.02	-.02	-.21	.835
Symptoms	.04	.02	.18	2.34	.020*
Concern	.03	.01	.20	2.59	.010*
Coherence	-.02	.01	-.15	-1.97	.050*
Emotional Response	.01	.01	.08	1.01	.316

Predictors: Consequences, Duration, Personal Control, Treatment Control, Symptoms, Concern, Coherence and Emotional Response.

Dependent Variable: Psychoticism