DEPARTMENT OF PSYCHOLOGY

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LIVING WITH DIABETES: A STUDY OF ILLNESS REPRESENTATION, SPIRITUAL COPING, PSYCHOLOGICAL DISTRESS AND MEDICATION ADHERENCE

BY

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DECLARATION

This thesis is a study submitted to the Department of Psychology for the award Master of Philosophy (MPhil) in Clinical Psychology. I hereby declare that this research is conducted by Christiana Owiredua under the supervision of Dr. A. Anum and Dr. B. Amponsah. This work has never been submitted to any other institution by anyone for any award. All references cited in this work have been duly acknowledged and I take full responsibility for any shortcomings in relation to this work.

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DEDICATION

I dedicate this work to my mother Mrs. Felicia Darkoah and Grandmother Mrs. Comfort Osei Ameyaw whose love and dedication always inspire me to soar higher and to be the best that i can be.

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And I am certain that God, who began the good work within you, will continue his work until it is finally finished on the day when Christ Jesus returns. I am much grateful to you almighty God for your grace and strength throughout this work. You have been faithful to me. My sincere appreciation to my supervisions of Dr. A. Anum and Dr. B. Amponsah for their time and inputs making this work a success. I say, thank you for your constructive directions, suggestions and advice. I also would like to thank Dr. Joseph Osafo and Mr. Quarshie (Dept. of Psychology, UG) for their immense support and guidance. I express my appreciation to the authorities of the Tema General Hospital especially staff of the diabetes clinic for their support making this work a reality. How can I forget Mr. Emmanuel Biney kwofie, Mr. Nathaniel Amoh Boateng, Ms. Winifred Asare-Doku , Ms. Anna Gyaban-Mensah and Mr. Prince Atorkey who supported me spiritually, emotionally, financially and academically to make this a reality. Finally I want to say a very big thank you to my family and friends who in one way or the other supported this course.

TABLE OF CONTENTS

Contents **Page**

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

DASS 21 Depression Anxiety Stress Scale 21

IPQ Illness perception Questionnaire

IPQ-R Illness Perception Questionnaire-Revised

MARS Medication Adherence Report Scale

SRM Self-Regulatory Model

TPB Theory of Planned Behaviour

TRA Theory of Reasoned Action

ABSTRACT

The study explored how patient's representation of diabetes, psychological distress and the use of spiritual coping influence their medication adherence. A total of 196 diabetics were sampled from the Tema General Hospital using the purposive sampling technique. The measures used included the Revised Illness Perception Questionnaire (IPQ-R), Spiritual Coping subscale of the Africultural Coping System Inventory, the Depression Anxiety Stress Scale 21(DASS-21) and the Medication Adherence Report Scale (MARS-5). Analysis using hierarchical multiple regressions and the Pearson product moment correlation coefficient showed that, illness representation components: illness consequence, personal control and emotional representation predicted medication adherence. On the other hand chronic timeline, illness coherence, emotional representation and consequences were the illness representation components that predicted psychological distress. Psychological distress, spiritual coping and demographic variables did not predict medication adherence. Again, spiritual coping did not mediate the relationship between illness representation and medication adherence. The findings of the research indicate the need to incorporate patients' illness representation in diabetes management.

CHAPTER ONE

INTRODUCTION

Overview of Diabetes Mellitus

Diabetes mellitus is one of the most common chronic diseases in nearly all countries, and continues to increase in numbers and significance due to changing lifestyles (Shaw, Sicree & Zimmet, 2010). Shaw et al. (2010) found out that, the world prevalence of diabetes among adults (aged 20–79 years) was 6.4%, affecting 285 million adults, in 2010. In 2014 the global prevalence of diabetes was estimated to be 9% among adults aged 18+ years (World Health Organization (WHO, 2014). In 2012, an estimated 1.5 million deaths were reported to be directly caused by diabetes with more than 80% of diabetes deaths occurring in low- and middle-income countries (WHO, 2014). It is also projected that diabetes will be the 7th leading cause of death by 2030 (Mathers & Loncar, 2006). This particularly does pose a threat to developing countries as a rapid prevalence rate is expected in this populace.

Diabetes mellitus refers to a group of metabolic diseases that are characterized by hyperglycemia. Hyperglycemia is caused by the body's inability to produce or effectively utilize enough insulin, a hormone that the body uses to convert food into glucose. As a result of this defect, the level of glucose in the blood becomes elevated Black (2002). It is characterized by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both (WHO, 1994). Three major types of diabetes have been identified, namely, Type -1, Type-2 and Gestational diabetes. Type 1 diabetes is one of the most common chronic childhood conditions and is characterized by inadequate or non-existent supplies of insulin, without which the body is unable to regulate blood glucose levels or use that which is in circulation. This inability of the body to regulate blood glucose levels or use that which is in circulation usually results in hyperglycaemia, leading to diabetic ketoacidosis, coma and death if left untreated (Edgar &

Skinner, 2003). Type 2 diabetes is said to result from the body's ineffective use of insulin and usually comprises 90% of people with diabetes around the world (Taylor, 2010). This has been greatly said to result from lifestyle and diet. Gestational diabetes mellitus (GDM) is defined as impaired glucose tolerance with onset or first recognition during pregnancy.

Usually symptoms of diabetes are not severe, or may be absent, and consequently hyperglycaemia, sufficient to cause pathological and functional changes, may be present for a long time either before a diagnosis is made or mismanagement after diagnosis (Arkkila & Gautier, 2003). The effects of diabetes mellitus have been documented in long-term damage, dysfunction and failure of various organs. The potential long-term effects of diabetes mellitus that has been documented includes potential blindness (WHO, 2012), renal failure (Suissa, Hutchinson, Brophy & Kezouh, 2006) and/or neuropathy with risk of foot ulcers, amputation (Pham et al., 2000).

The long-term manifestations of diabetes has been identified as a contributory factor to its status as a leading cause of premature illness and mortality worldwide (International Diabetes Federation, 2006). However, long-term glycaemic control has also been established as being fundamental to the management of diabetes and has been shown to reduce both microvascular and macrovascular complications (Asche, LaFleur & Conner, 2011). Although healthy lifestyle choices including diet, exercise and weight control provide the foundation for managing diabetes, usually, patients need medications to achieve target blood sugar (glucose) levels which are ultimate in diabetes care. According to the guideline from the joint consensus of the European Association for the Study of Diabetes and the American Diabetes Association, pharmacotherapy for diabetes depends on a patient's diagnosis: type 1 diabetes is treated with exogenous insulin, whereas type 2 diabetes is treated initially with an oral anti-hyperglycaemic agent with additional agents being added as needed (Nathan et al.,

2009). Nevertheless, despite adequate diagnosis and medical care, patients often fail to derive the optimal clinical benefit of drug therapy because of medication non-adherence and thus making management of chronic illness a pervasive clinical challenge (Simoni, Frick, & Huang, 2006).

Medication Adherence and Diabetes

The treatment of chronic illnesses commonly includes the long-term use of pharmacotherapy Brown and Brussell (2011). Although medications are effective in combating diseases, their full benefits will not be realized when not taken as prescribed. The effect of diabetes proves fatal for sufferers and as such optimal management for better health outcomes among patients affected cannot be underscored. As indicated initially, one major predictor of health outcomes documented among chronic illness patients' including diabetics is medication adherence (Yu, Yu & Nichol, 2010). Medication adherence is conceptualised as the extent to which an individual's behaviour in taking medication corresponds with agreed recommendations from a healthcare provider. It is established that non-adherence to medications is a problem in clinical practice, especially among patients suffering from asymptomatic chronic conditions such as diabetes, hypertension etc. (Pladevall et al., 2004). However, medication non-adherence among diabetic patients has been found to be very high compared with other chronic conditions, which impedes proper management of the disease with studies reporting adherence rate as low as 36% (Cramer, 2004; DiMatteo, 2004; Jambedu, 2006; Mann, Ponieman, Levental & Halm, 2009).

Illness Representations and Medication Adherence

Recently, research in the area of health and illness behaviour has seen changes in the approach to the study of health with clinicians and researchers adopting cross disciplinary and integrated approaches. This change in approach is indicated to be partly due to the call

for the bio-psychosocial approach (Dienfenbach & Leventhal, 1996). This approach is seen as emphasizing the role of environmental and subjective factors. Several determinants of health outcomes among patients suffering from illnesses have been established and that, outcomes of disease management in patients are determined not only by objective indicators but also by subjective factors adopted by individual patients (Leventhal, Weinman, Leventhal & Phillips, 2008). One of such subjective predictors of health identified in the literature is illness representations.

Illness representations are defined as patients' beliefs and expectations about an illness or somatic symptom. Illness representations are concerned with those variables that patients themselves deem to be central to their illness experience and management of their illness condition (Edgar& Skinner, 2003). Thus, how patients believe or expect their illness to be, has been found to be directly or indirectly related with their health behaviours as well as health outcomes (Diefenbach & Leventhal, 1996). Leventhal's Self-Regulation Theory (Leventhal, Meyer, & Nerenz, 1980) introduces a patient centred understanding to the dynamic factors involved in health behaviours including adherence. Central to this model are the representations that patients hold about their illness, whereby illness representations are defined as "patients' own implicit, common-sense beliefs about their illness". The proponents of the model propose that, individuals, in order to understand and cope with their illness,

form a mental representation of their illness, which has both cognitive and emotional content. Thus, people try to make sense of their illness by developing a working framework of what their illness is which in turn influence actions that are taken concerning the illness.

The cognitive representation components are said to be ordered along five dimensions (Leventhal, Nerenz & Steele, 1984). They are Identity (the name or label of the illness threat), Timeline (the illness's believed time trajectory (e.g., acute, chronic, cyclical), Consequences (the believed consequence of an illness (minor or major)), the Cause (the illness causal mechanism (e.g., hereditary, external, internal) and Control/cure (whether something can be done to control the threat including the efficacy of medicine to control the disease). Other components identified later and included are illness coherence (Lau & Hartmann, 1983) and emotional representation. The emotional representation component of the model which is only recently been studied reflects a person's evaluation of the potential emotional impact of the illness or condition (Moss-Morris et al., 2002).

Patients' illness representations are formed through individual's personal experienced symptoms and information through social and cultural channels (Hirani & Newman, 2005). Although these representations may not necessarily be in line with the scientific view of the illness, they are established to guide health behaviours most of the time (Reynolds, 2003). Thus, people will act in ways that are consistent with their beliefs or personal representation of their disease. Among adults, research on chronic conditions has found that illness representations account for the diversity in disease-related functioning (Petrie, Weinman, Sharpe, & Buckley, 1996).

In this sense, Leventhal, Meyer and Nerenz (1980) explain that illness behaviour and outcomes such as medication adherence and psychological health will be influenced by patient's own representation of diabetes. An individual's representation of diabetes with

respect to the cause of the illness and their general belief about the illness will determine the extent to which they will take their medication as recommended as well as the distress experience psychologically.

Spiritual Coping and Medication Adherence

Chronic illness confronts a patient with numerous threats and challenges which may range from the need to keep emotional balance and a satisfactory self-image, the need to maintain a sense of mastery over the illness condition and preparation for an uncertain future due to the illness that has come to stay with the individual (de Ridder & Schreurs, 2001). Also life-style changes and other self-management tasks are all paths that can lead to illness-induced disruptions within patients. Hence, there is the need for effective coping for better management of patients suffering from such chronic illnesses. A review in the past on coping research and its potential for intervening in the adaptive process of the chronically ill considered coping theory to constitute a promising framework for the management of chronic conditions (Turk, 1979).

Coping is defined as "cognitive and behavioral efforts to master, reduce, or tolerate the internal and/or external demands that are created by the stressful transactions" (Muller & Spitz, 2003). That is the process of managing demands (external or internal) that are appraised as taxing or exceeding the resources of the person. It is seen as a process involving at least two stages: primary appraisal (which evaluates whether the issue at hand is something to bother about?), and secondary appraisal (which assess what can be done about the situation at hand if it is appraised as a bother) (Andersson & Willebrand, 2009). Research in recent times has found coping to be involved or playing a significant role in health behaviours and outcomes. It has been established that coping does predict health behaviours including medication adherence, which in turn informs outcomes. Also coping has been found to play a

significant role in the relationship between Illness representation and illness outcome and illness action with coping found to mediate the link between illness representation and disease outcome (Rutter & Rutter, 2010). The Self-regulation theory predicts that illness representations will be directly related to coping and, through coping, to adaptive outcome. The results of the study of Moss-Morris, Petrie,Weinman (1996) however, suggested that illness representations may also directly affect health behaviors and outcomes. Thus the representation that is adopted may inform the coping strategy adapted which in turn also influences health actions taken and can as well directly influence health behaviour.

Recent researchers assert that, coping occurs in a cultural context and as such, research on coping ought to be measured culturally. For instance Daly, Jennings Beckett and Leashore (1995) found that African Americans, when confronted with stressful situations, depend on group-based ego strengths and often employ metaphysical approaches to coping based on religious and/or spiritual belief systems (e.g., prayer, meditation). Africans are thus said to use spiritual means of coping in times of difficult situations and in Ghana, it is not uncommon for people to abandon medical treatment including medication for spiritual based treatment especially in situations where the disease cannot be cured but only managed. However, until recently, measures of coping were, for the most part, grounded in Eurocentric worldview and conceptualizations (Utsey, Adams & Bolden, 2000). According to this Eurocentric framework, coping is viewed as either problem focused (directing energies toward managing the stressful situation itself) or emotion focused (managing of one's emotional response to a stressor) (Folkman & Lazarus, 1988). Again, previous research on the role of coping in mediating the relationship between illness representation and health behaviours focused on Eurocentric coping styles (Rozema et al., 2009). The concept of spiritual coping although identified to be usually used by people of African descents mostly in the face of stressful situations has not been explored thoroughly and it is not known

whether this coping style is a protective factor or risk factor with respect to medication adherence. It therefore makes it necessary that such concept is explored on how it relates with illness representation in predicting medication adherence among diabetics in its context such as Ghana.

Psychological Distress and Medication Adherence

The incidence of coexistence of anxiety and depression with medical conditions has been a topic of discussion and consideration among clinical practice and research interest with these cited among the most common affective disorders seen in medical practice (DiMatteo, Lepper & Croghan, 2000). Previous work indicates that clinically significant depressive symptoms are highly prevalent in primary care patients (Zung, Broadhead & Roth, 1993). However, diabetic patients are among one of the identified groups of patients that mostly experience depression and anxiety with the study by Anderson, Freedland, Clouse and Lustman (2001) suggesting that comorbid depression is more prevalent in individuals with diabetes than in other primary care patients. This may be due to diabetes distress experienced by patients resulting from numerous self-management activities ranging from checking blood glucose, taking medications, counting carbs, and other tasks which present extra toll on individuals living with diabetes. Again it is asserted by Black (2002) that depressed diabetics are less motivated to adhere to treatment regimes, are less socially and physically active which may lead to or add to the non-adherence observed in this population. It is noted that anxiety and depression may complicate the treatment of medical conditions fairly if not treated or dealt with (Katon, 1984).

Recent developments in health suggest that strong positive relationships exist between the cognitive representation dimensions and outcomes such as anxiety and depression. For instance Moss-Morris et al. (2002) reports that, patients who believe their illness have more

serious consequences, serious emotional consequences and perceive their illness as more chronic are found to be more anxious and depressive. It is therefore necessary to explore the relationship between such psychological distress variables and medication adherence as well as how illness representation variable may predict psychological distress and how these may in turn predict adherence among diabetic patients for better management of diabetes.

Statement of Problem

The incidence of diabetes especially type 2 diabetes which comprises about 90% of people affected with diabetes worldwide is on the ascension with a prevalence rate of about 9% among adults aged 18 years and above (WHO, 2012). To make matters worse, medication non-adherence is identified as a key medical problem that is common among patients with chronic disease generally and type 2 diabetes in particular (Rozenfeld, Hunt, Plauschinat & Wong, 2008). Diabetes is a complex disorder that requires keen attention to diet, exercise, glucose monitoring and medication to achieve good glycemic control. It is established that when patients with diabetes do not adhere to their drug prescriptions, the efficacy of the medication declines (Feinstein, 1990) as well as increased blood sugar levels. As such individuals who do not adhere to their medication are at higher risk of complications both acute and chronic. These complications may lead to higher need for hospitalization, additional health cost as well as increased level of morbidity.

Medication adherence among diabetic patients in Ghana is estimated to be low with reported rate ranging between 40% - 50% (Jambedu, 2006). Recent research have established that lower fasting blood glucose levels are associated with reduced incidents of death as well as reduced incidence of complications in patients with diabetes (Jansson, Anderson & Svardsudd, 2010). However, ensuring that patients take their diabetic medications as prescribed to achieve normal or near normal blood glucose control is among the most

common challenges encountered by physicians and other health care providers involved in the treatment of patients with diabetes which is reflected in the rate of reported adherence. Further, illness representation, psychological distress as well as coping are demonstrated to impacts on medication adherence. It is also realised that these variables are interrelated but have been studied separately in most of the studies considering them individually. Again the concept of spiritual coping which is contextual in the Ghanaian setting has not been considered with respect to illness representation and medication adherence.

Relevance of the Study

Identifying and understanding the significance of non-adherence and identification of the factors contributing to non-adherence to a prescribed treatment through a continued research can assist in planning interventions to overcome the barriers. Hence, this study will be carried out to give information on diabetic patients' non-adherence and related factors that may help in the healthcare system for whom it concerns. This study intends to highlight the role of illness representation, spiritual coping and mental health status in anti-diabetic medication adherence behaviour. The identification of these relationships would form the basis for incorporating early assessment and psychological care into the treatment plan of diabetic patients at the initial stage of diagnosis to encourage adherent behaviour. In addition Participants use of spiritual coping in aiding in medication adherence will be explored to inform management on areas to be explored when patients are being placed on medication. Also the study outcomes will inform policy decision making by recommending measures to be put in place in the care of diabetic patients to increase adherence. This study will add to existing literature in the area of illness representation, coping, mental health and medication adherence in Ghana since the relevant literature in this area are few and deficient if not non-existent in the country.

Also the exploration of spiritual coping and its association with medication adherence is culturally significant. The study will help maximize treatment adherence as an effort to reduce the numerous disease complications resulting from non-adherence to anti-diabetic medication. Lastly, the study will help as a baseline for further study on patient's adherence and determine various adherence and non-adherence issues. This is imperative to understand holistically factors affecting patients' adherence to medication in order to identify the areas upon which counselling should be focused as well as assisting in the development of future interventions to improve adherence and outcomes of diabetes treatment.

Aims and Objectives

The main aim of the research was to explore how diabetic patient's illness representations, the use of spiritual coping and psychological distress are related as well as predict their medication adherence in Ghana

To do this, the specific objectives of this research included:

1. To explore the illness representation components that will significantly predict medication adherence among diabetic patients.
2. To explore whether spiritual coping will significantly predict medication adherence.
3. To explore whether psychological distress will significantly predict medication adherence.
4. To find out if illness representation will significantly predict psychological distress.
5. To find out if spiritual coping will significantly mediate the relationship between illness representation and medication adherence.
6. To explore whether demographic variables (age, education, gender, religious affiliation, duration of illness) will significantly predict medication adherence.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter presents a review of some theoretical underpinnings of medication adherence. The review examines psychological theories relating to patients illness representation and adherence behavior. This chapter also reviews related studies in relation to illness representation, psychological wellbeing, spiritual coping and medication adherence. Lastly the hypotheses and conceptual framework have also been presented in this section.

Theoretical Framework

For the understanding of the relationship between variables and concepts three theories will be used in relation to understanding the study variables. These are the Common Sense Model of Illness Representation by Leventhal et al. (1980), The Theory of Planned Behavior (TPB) (Ajzen, 1991) and the Africultural Coping Systems Theory (Utsey et al., 2000).

The Self-Regulatory Model (SRM) of Illness Representation

A number of reasons have been given to explain the variations in treatment adherence among patients (Catz, Kelly, Bogart, Benotsch, & McAuliffe, 2000; Vermeire, Hearnshaw, Van Royen, & Denekens, 2001). Recent developments in health behaviors are in the area of psychological theories that relates to the area of patients' beliefs. One theory based on patients' representations (personal beliefs and expectations about an illness or a somatic symptom) of their illness is the Self-regulatory Model (SRM) of Illness Representation (Leventhal, Meyer & Nerenz, 1980). According to the SRM of illness representation, individuals actively generate cognitive and emotional representations of their health threats which in turn influences their choice and evaluation of their coping strategies. The model explains that patient's beliefs and expectations that are generated about their illness integrate

with existing information concerning previous illness experience lived or from others and this enable them to make sense of the condition as well as guide the actions undertaken. The basic supposition underlying this theory is that patients beliefs and expectation of their illness are used in interpreting the meaning of illness or somatic symptom, deciding on a response, and evaluating the appropriateness of their response (Baumann, 2003).

The SRM suggests that illness beliefs are structured around five main cognitive dimensions: illness identity, consequences, control/cure, timeline and causal factors. The illness identity dimension represents how people label their disease (e.g. diabetes) and the symptoms they believe to be caused by the disease (e.g. fatigue, dizziness etc.). The causal dimension represents a patients' representation of the underlying cause of the illness (e.g. stress, heredity, lifestyle etc.). The consequences dimension represents the expected effects and outcome beliefs regarding the impact of the illness on all dimensions of health-related quality of life of the patients. The timeline dimension refers to personal beliefs about whether the illness will be acute, chronic or cyclical in nature. The curability or controllability dimension reflects an individual's beliefs about whether the illness is curable or controllable and beliefs regarding the ability of the patient and treatment to influence the course of the illness.

The proponents of this model view the individual as a problem solver, who is trying to close the gap between his or her current state and the goal state (Weinam, Wright & Johnston, 1995). The SRM provides a framework for understanding behavioral responses to a number of illnesses conditions (Hagger & Orbell, 2003). The SRM will thereby help provide a conceptual framework for understanding non-adherence to treatment recommendations (Horne, 1997).

From this framework, adherence can be considered a form of coping that is influenced by the individual's illness representations. Thus, patients will take their medication based on their

personal concepts and beliefs. These representations that patients have concerning their illness are said to vary across disease as well as influence by the social contest (Hagger & Orbell, 2003). An important consideration is that although a patient's behavior is not always necessarily and medically rational and that their health responses are usually informed mostly by their beliefs and expectations. As such the concept ought to be explored for different illness groups. Hence, the current research will explore how these representations influence medication adherence among diabetics which is on the rise in developing countries to plan for interventions that are culturally sensitive for utmost management disease.

The Theory of Planned Behaviour (TPB)

The theory of planned behavior (TPB) (Ajzen, 1991) was developed in an attempt to extend the Theory of Reasoned Action (TRA) to include behaviors that are not entirely under volitional control. Ajzen (1991) extended the TRA by adding a variable known as perceived behavioral control. The TPB is a social cognition model that proposes that behavior is a linear function of behavioral intentions and perceived behavioral control. Perceived behavioral control refers to the perceived ease or difficulty of performing a behavior and is believed to be a function of an individual's control beliefs (Ajzen, 1991). As such, intentions to perform behaviors of different kinds can be predicted with high accuracy from attitudes toward the behavior, subjective norms, and perceived behavioral control.

It is again assumed that perceived behavioral control do have a direct influence on intention and that for desirable behaviors, greater perceived behavioral control should lead to stronger intentions. Not only does perceived behavioral control influence intention but it has been said to influence behavioral outcomes directly through two main mechanisms (Kraft, Rise, Sutton, & Røysamb, 2005). One mechanism through which perceived behavioral control influence behavior is that, holding an individual's intentions constant, an individual with higher

perceived behavioral control is likely to try harder and to persevere for longer than one with lower perceived control (Kraft et al, 2005). Investigations have shown that people's behaviors are strongly influenced by their confidence in their personal ability to perform it (i.e., by perceived behavioral control) (Sniehotta, 2009). The theory of planned behavior has been tested on a number of behavior outcomes. In one recent meta-analysis of 185 independent studies until 1997, it was found out that the TPB accounted for 27% and 39% of the variance in behavior and intention, respectively. As well, the behavioral control (PBC) construct also accounted for significant amounts of variance in intention and behavior, independent of theory of reasoned action variable (Armitage & Conner, 2001).

In the study of medication adherence in this present study, it is anticipated that individuals personal beliefs about their personal control will increase adherence to their diabetic medication. Thus, patients with higher perceived personal control over their diabetes are likely to try harder and to persevere for longer in taking their medication than those with lower perceived behavioral control over their diabetes.

The Africultural Coping Systems Theory

The theory asserts that culture impinges on all aspects of stress and coping process and serves as a resource in coping within a cultural context. The system asserts that individuals of African descent when faced with a stressor adopt coping behaviours specifically derived from African culture (Utsey et al., 2000). One of the most frequently identified ways of coping among people of African descent is the spiritual-centred coping (Utsey et al., 2000). As such, the study of coping in the current research will assess how this culturally specific coping style relates to their anti-diabetic medication adherence which is predictive of their health outcome.

Review of Related Literature

Illness representation and medication adherence

Optimal adherence to anti-diabetic medication is already established as essential for reducing mortality and morbidity in persons living with Diabetes. Studies have illness representation, as an important predictor of health behaviours and outcomes. Few studies have explored the potential influence of this variable on medication adherence which is a major predictor of health outcomes in chronic disease patients with almost all studies done in this area done outside of Ghana.

In one study by Jacobs, Kemppainen, Taylor and Hadsell (2014), they assessed personal beliefs about the causes and meaning of having diabetes among the members of the Lumbee Indian tribe living in rural southeastern North Carolina. The study sample included 20 males and 20 females. In their findings, Pearson correlation analysis of the IPQ-R subscales and medication adherence indicated that scores on medication adherence scale were moderately correlated with scores on the Consequences subscale and the Emotional representation subscale. Thus in this study, the representation that diabetes will have major negative impacts on patients' life's as well as representing diabetes with more negative emotions were associated with higher adherence to medication adherence. Thus rather these negative constructs induces higher adherence among patients. Again no significant differences were found for age (over or less than 50 years) or gender .In this study, the sample size of 40 is generally low for generalization with regards to the quantitative data. In addition to improving sample size this relationship is being tested in a different setting.

In a similar study, Ross, Walker and MacLeod (2004) sought to describe hypertensive Patients' beliefs about their illness (consequence, personal control, treatment control and emotional representation) and medication using the self-regulatory model and whether or not

these beliefs influence compliance with antihypertensive medication. Also explored was the influence of age and gender on medication compliance. In all, 514 patients were recruited from a secondary care hypertension clinic and shared care scheme. The results of the study indicated that compliance was significantly influenced by age and gender. Thus, older patients were more compliant than younger patients as well as women compared with men. Again, some aspects of illness beliefs were found to be negatively associated with compliance as well as positively. The aspect that was negatively associated with compliance was higher emotional representation of illness. On the other hand lower consequence, lower personal control beliefs and high-treatment control beliefs were associated with high compliance. Further a multiple logistic regression analysis showed that emotional response to illness and personal control beliefs were the illness beliefs components that were most predictive of compliance in this population. This result is contradictory to the previous study which could be due to differences in disease experience as well as information through social and cultural channels (Hirani & Newman, 2005).

In another study, Horne and Weiman, (2002), sought to evaluate the degree to which perceptions of asthma and perceptions of asthma medication could predict variation in reported adherence. Also investigated is whether or not demographic variables could predict medication adherence in this populace. Using a cross-sectional design, 100 community-based patients were sample from consecutive attenders at asthma clinics in two general practice surgeries in Mid Sussex. Adherence to preventer medication was assessed by patients' self-report. In their findings, a hierarchical linear regression analysis revealed that socio-demographic and clinical factors explained only a small amount of variance in adherence whereas illness perceptions and treatment beliefs were both independent predictors. It was further found that, non-adherent behaviors were associated with doubts about the necessity of medication and concerns about its potential adverse effects and with more negative perceived

consequences of illness. This finding emphasizes how patient's beliefs and expectations about the negative consequence of their disease negatively impact their medication adherence behavior.

In another study by Kim and Evangelista (2010), the researchers described illness perceptions, adherence behaviors, and clinical outcomes in a sample of patients with End Stage Renal Disease (ESRD) on maintenance hemodialysis. A total of 151 patients who spoke English, Spanish, or Korean were sampled between August 2008 and January 2009 from 8 outpatient dialysis centers in Los Angeles County, California. In their findings, With respect to illness representation and adherence, only treatment control among the dimensions of illness perception's control dimensions was negatively correlated with non-adherence to diet restrictions, implying that, as higher treatment control beliefs increases, non-adherent to their diet restrictions decreases. In addition, older patients had positive correlations with higher adherence to hemodialysis treatment and medications.

Also in a similar study conducted among coronary heart disease patients, Mosleh and Almalik (2014) explored patients' illness perception beliefs concerning their illness and whether these beliefs could predict adherence to healthy behaviors. The researchers adopted a multi-center cross-sectional survey as the research design for conducting the study at four tertiary hospitals in Jordan with adherence measured in three areas; physical activity, medication, and dietary recommendations. In all, a total 254 coronary heart disease patients who visited the cardiac clinics of the research sites for routine review between March and June 2013 were sampled as research participants using the convenience sampling technique. In their results, it was found out that statistically significant correlations were established between increasing age and each of timeline, treatment control and coherence. With respect to illness perception beliefs and physical activity, a stepwise regression model with

medication adherence score as the dependent variable, concern, and personal and treatment control were independent predictors of medication adherence and explained 11.3% of the variation in medication adherence. Indicating that, patients who had strong beliefs in their ability to control the disease (personal control), those who believed in their treatment's ability to influence the disease (treatment control) and those with a deep concern about coronary heart disease were more likely to adhere to prescribed medication and other recommendations.

Furthermore a study by Woith and Rappleyea (2014) explored whether emotional representation and illness coherence predicted delay in seeking treatment and medication adherence. A cross-sectional descriptive design was conducted using a secondary analysis of the Tuberculosis Delay and Adherence dataset of 105 participants (Woith & Larson, 2008). Emotional representation and illness coherence was assessed with two subscales of the Revised Illness Perception Questionnaire (IPQ-R). Adherence was measured using clinic medication administration records, which was calculated by dividing the number of ingested doses by the number of prescribed doses. There was no found significant relationship between illness representation and delay in seeking treatment or adherence or between illness coherence and delay in seeking treatment or adherence. This result could be as a result of low the way medication adherence was measured as indicated by direct questioning.

MacInnes (2013) in a cross-sectional survey with 169 chronic heart failure patients explored the relationships between illness representations, treatment beliefs and the performance of self-care using the common sense model of illness representation. Self-care behavior was assessed among this population using the Looking After Yourself with Heart Failure Questionnaire (LAYHFQ). The LAYHFQ assessed the self-care dimensions of lifestyle behavior, symptom monitoring, medication adherence, managing symptoms and reporting

and seeking help. In a stepwise multiple regression, illness representation components that significantly correlated with self-care (consequences, coherence, treatment control, and timeline) alone accounted for 23% of the variance in self-care. In this study however, medication adherence was incorporated into general self-care but the current research explores this in medication adherence alone which may produce different results than this.

In a study by de Graft Aikins, Anum, Agyemang, Addo, and Ogedegbe, (2012), the researchers used focus group discussions with lay people (N= 51) in Accra, Nkoranza and Kintampo to explore the knowledge of prevalent chronic diseases in Ghana , chronic disease causal theories and chronic disease treatment. In their findings, diabetes and hypertension were listed by all groups and multiple causal theories were presented for diabetes and hypertension which included poor diet, poor lifestyles (smoking, drinking, and physical inactivity), psychological stress, and heredity.

The findings from the reviewed study demonstrate the differences results obtained in illness representation predicting adherence among different illnesses and across different cultures. This therefore makes it necessary to identify the components that predict specific disease in our case diabetes and in our setting as suggested by Hirani & Newman (2005).

Psychological Distress and Medication Adherence

Recent measure of health incorporates mental health as essential and part of patient's health. Studies of patients undergoing physical health has indicated that most patients especially those suffering from chronic illness experience comorbid mental health problems which impact on their health, health behaviors as such outcomes (Turner & Kelly, 2000 ; Wittchen, Mühlig & Beesdo, 2003). For instance in a study by Russo, Katon, Sullivan, Clark and Buchwald (1994), it was found that a dose–response relationship existed between an

increasing number of DSM-IV anxiety and depressive disorders and a linear increase in medically unexplained physical symptoms.

In another study by Lin et al. (2004), the researchers assessed whether diabetes self-care, medication adherence and use of preventive services were associated with depressive illness. A total of 4,463 patients with diabetes were recruited from Group Health Cooperative (GHC), a prepaid health plan serving about 450,000 members in western Washington State. The study employed the epidemiologic survey and was conducted between 2001 and 2003. Pharmacy data was used to assess medication adherence. In their findings, the authors showed that major depression was present among 12% of this primary care sample with diabetes and was more prevalent among women with diabetes than men. As expected, diabetic patients with major depression showed fewer adherences than diabetic patients without major depression with all three kinds of medications examined. Findings from this study indicate suboptimal diabetes management across the spectrum of self-care assessed and as well related with major depression. From these findings, it is observed that some elements of mental health problems were reported by the diabetic patients who influence their medication adherence and other patient-initiated behaviors such as diet, exercise. In this study however, psychological distress was limited to depression.

In a meta-analysis by Grenard et al. (2011), they explored the association between depression and medication adherence among patients with chronic diseases. In all 31 studies with 18,245 participants were included in the study and analysis. The results indicated that the estimated odds of a depressed patient being non-adherent were 1.76 times than that of a non-depressed patient. This implies that depressed patients were more likely not to adhere to their medication than their non-depressed counterparts. Also a comparative analysis findings indicated that the association between depression and adherence were similar across disease

types but was not as strong among studies that used pharmacy records compared to self-report. That is in studies that used pharmacy records the association between depression and adherence was weaker compared with those that measured adherence with self-report measures. This analysis provides evidence that depression is associated with poor adherence to medication across a range of chronic diseases. This in a way could mean that that the findings, with respect to this aim in the study although limited to diabetes patients can be generalized to other chronic illness sufferers.

In a related study that aimed to evaluate the influence of simultaneous depressive and anxious symptoms on medication adherence in patients with stable coronary artery disease (CAD), Dempe et al. (2013) used a cross-sectional study of 606 inpatients with stable CAD. The authors, in a correlational analysis found out those depressive and anxious symptoms were weakly and independently associated with medication non adherence. However, in a comparative analysis it was found out that, compared to non-depressed, patients with depressive symptoms had an up to 3.6-fold odds, those with anxious symptoms an up to 3.2-fold odds of non-adherence. Among patients suffering from anxiety and depression, the odds of being non adherent was up to 4.4 times higher compared to patients without symptoms. This study, although established weak correlation between variables is one of the few that explored the influence of anxiety on adherence.

However, Kretchy, Owusu-Daaku and Danquah (2014) in a study sought to ascertain the prevalence and role of psychological distress (stress, anxiety and depression) on anti-hypertensive medication adherence. The study employed the cross-sectional method involving 400 hypertensive patients in two tertiary hospitals in Ghana. Research data were gathered on patient's socio-demographic characteristics, anxiety, depression and stress on medication adherence. Of the psychological distress components assessed by the researchers,

stress among patients increased the likelihood of medication non-adherence. Thus anxiety and depression in this study did not significantly relate with medication adherence.

Illness representation and psychological distress

In a recent research, McCABE, Barnason, and Houfek, (2011) described illness beliefs in patients with recurrent symptomatic Atrial fibrillation (AF) and the relationships among illness beliefs having implications for self-management. In all 207 AF patients completed the Illness Perception Questionnaire-Revised. Data was analyzed with descriptive statistics and Pearson correlations. Findings indicated that Subjects perceived AF as chronic and unpredictable with serious consequences. Subjects reported that AF induced worry, anxiety, and depression. Stronger beliefs about AF as cyclical, unpredictable, and greater consequences were associated with more negative emotion. Again, Subjects reporting a good understanding of AF endorsed fewer negative emotions related to AF.

Again, Heyhoe and Lawton (2009) examined the illness beliefs of patients with interstitial cystitis (IC) and their experience of psychological distress. The mixed method approach was used in this study to measure the extent to which this measure adequately represented the illness representations of this group. In all, 44 patients with IC attending an out-patient clinic at a UK hospital were made to complete a questionnaire that assessed illness beliefs and distress. Pearson's correlation revealed that consequences, illness coherence, emotional representations were significantly related with psychological distress.

In another study by Paddison, Alpass and Stephens (2010), the researchers examined the relationship between illness perceptions and illness-related distress among adults with type 2 diabetes. Research participants of 615 were selected from a primary care database in New Zealand. Multiple regression analyses controlling for age, clinical characteristics indicated that, illness perceptions accounted for a significant variance in distress about diabetes. Higher

distress about diabetes was associated with a perception that diabetes has serious consequences, difficulties 'making sense' of diabetes. That is lower coherence and higher consequences were

Spiritual Coping and Medication Adherence

Over the past two decades, the area of religion, spirituality and coping has received a lot of research attention and has documented important links between religiosity and health (Koenig, McCullough & Larson, 2001; Nuworsa, 2013). This upsurge in interest in religion and spirituality has been explained to probably be due to the fact that many people turn toward their faith under extreme situations such as severe illness (Ganzevoort, 1998). A recent study such as Koenig (2004) has also demonstrated that religious beliefs influence medical decisions, such as the use of some life-saving treatments, and at times may conflict with medical care. However, there have been few studies that explored the direct relationship between spiritual coping and medication compliance.

Vyavaharkar et al. (2007) in their study examined the relationships among socio-demographic factors, social support, coping, and adherence to antiretroviral therapy (ART) among HIV-positive women with depression. Medication adherence was measured by the researchers with two indicators; self-report of missed medications and reasons for missed medications in the past month. In all eight Coping response styles were measured using the Family Coping Project Coping Scale (FCPCS). The subscales included Denial/Avoidance, Spiritual Activities, Managing HIV Disease, and Positive Thinking; Focus on Present, Focus on Others, Seeking Social Support and Seeking Information. The study participants comprised of 224 women receiving ART of 280 women recruited from community-based HIV/AIDS organizations in the southeastern United States. The findings indicated coping by spiritual activities, negatively correlated with reasons for missed medications. This finding

may be due to the sample comprising of only women and may not necessarily reflect the general population

In a related study by Kretchy, Owusu-Daaku and Danquah (2013), the researchers sought to examine the interrelationship between spirituality, religiosity and medication adherence among hypertensive patients in two tertiary hospitals in Ghana. In all, a total of 400 hypertensive patients who were 18 years old and above as of the time of data collection and had been on medication for at least 6 months prior to data collection. The findings of the study indicated that, adjusting for demographic characteristics and co-morbid health conditions, spirituality, but not religiosity, was associated with medication non-adherence, although patients exhibited high levels of both spirituality and religiosity at. Specifically, patients with high spirituality were 2.68 times more likely to be poorly adherent than patients who placed lower emphasis on the association between spirituality and health. This further suggests that some patients would risk not taking their medications while anticipating divine healing outcomes. Therefore spiritual coping is anticipated to be negatively related with coping.

In a longitudinal study by Henry (2013), the researcher examined whether spiritual coping was related to health behaviors measures, specifically medication adherence, safer sex practices, and substance use as well as depression levels in an HIV+ population over a two year period. In all a total of 177 HIV positive men and women in the midrange of illness as indicated by a CD4 count number ranging between 150 and 500 and no previous AIDS defining symptom were sampled as participants for the study. Medication adherence in this population was assessed during the interview phase using the AIDS Clinical Trials Group (ACTG) Adherence Measure. The AACTG assessed medication type, number of missed medication doses in the past four days, number of days within the past four days that all

medication doses were missed, frequency with which medication was not taken as directed in the past four days . Spiritual coping was assessed with the use of interviews and themes were derived though qualitative content analysis. Using a basic linear regression, the results indicated that SC was not significantly related to medication adherence at baseline as well as over time. That is, spiritual coping did not predict medication adherence in this population. In the study adherence measures were obtained through direct interviews which might have influenced responses to the questioning of the items on the (ACTG) Adherence Measure as patients might give desiring responses and as such might not reflect the realities of their behavior. Therefore findings could be that desirable information was given by patients' possibly compromising the data.

In order to provide an examination of the relationship between the religious beliefs and spirituality of patients on hemodialysis (HD) therapy, satisfaction with life, satisfaction with medical Care and adherence, Berman et al. (2004) using multiple religiosity scales and scales to assess patient satisfaction with life and social support, studied the relationship between of these variables in HD patients. The researchers adopted the cross sectional survey method and sampled a total of 74 HD patients from two dialysis units in Philadelphia, PA. The questionnaires were read to the patients, and the researcher recorded their answers. In their findings it was found out using multiple linear regressions that, significant predictors of adherence were age and years on dialysis therapy. Thus greater level of adherence was associated with older age and a greater number of years on dialysis therapy. In contrast no relationship existed between spirituality and adherence in their population determined by using all 3 spirituality scales. In the study adherence measures were obtained verbally which might which might make patients give desiring responses and as such might not reflect the realities of their behavior explored. Again, of the few studies that investigated the direct

relationship between spirituality and medication adherence, the studies in this area explored the relationship among HIV/AIDS and End Stage Renal Disease which is symptomatic.

In a study by Brown et al. (2007), the researchers sought to test the applicability and utility of Leventhal's model of illness cognition in a sample of depressed primary care patients. They as well tested the mediating effects of coping behaviors. To do this, demographic information, depression diagnoses, depressive symptom severity, self-reported psychosocial and physical functioning, medical comorbidity, illness beliefs, and depression coping strategies were obtained from 191 primary care patients receiving antidepressant medication for the treatment of depression were obtained. The results indicated that coping behavior did not mediate the relationship between illness beliefs and physical functioning.

In another study, Searle, Norman, Thompson and Vedhara (2007) to examine the relationships between illness representations and the relative importance of coping cognitions and coping behaviors in the context of the management of type 2 diabetes. The relationship between illness representations and coping variables was explored. In all a sample size of 134 Type- 2 diabetes patients were assessed with the IPQ-R along with coping cognitions and coping behaviors. The results indicated that Illness representations predicted coping cognitions and coping behaviors but coping cognitions was not found to mediate the relationships between illness representations and coping behaviors which included adherence behavior. The authors further suggested that coping cognitions and coping behaviors appears to be distinct mechanisms that operate independently. Although the studies indicated that coping did not mediate the relationship between illness representation and medication adherence, Leventhal model is being tested in light of spiritual coping which may produce results different from the above.

Rationale for the Present Study

Patients' illness representations have been identified as playing a significant role in adjustment to their illness especially sufferers of chronic illnesses (Hagger & Orbell, 2003; Rozema, Vollink & Lechner, 2009). The researches reviewed above have established that illness representation, psychological wellbeing and coping strategies patients adopt do inform health outcomes. The illness representations model proposes that people evaluate their health threats by constructing their own representations of their illness, which in turn influences their patterns of coping and adjustment.

Even though from the on-going discussion it has become clear that patients beliefs and expectations about their illness, the coping resources used in dealing with their illness and psychological distress impact on health behaviours including medication adherence, little if not any has been explored in Ghana (Kretchy, Owusu-Daaku & Danquah, 2014; Nuworsa, 2014). Likewise, previous studies that have been done were conducted in the western world and concentrated on Eurocentric coping styles leaving gaps in research in our part of the world. Again, these coping strategies as identified are not contextual in the Ghanaian setting hence the need to explore spiritual coping which is identified to be used mostly by Africans when confronted with stressful issues in their environs including illness Utsey et al. (2000). Also how this contextual coping style relates with medication adherence directly as well as mediating illness representation and adherence behavior becomes necessary as well. Also a second look at the study that explored medication adherence among diabetics in Ghana (Jambedu, 2006) explored little on the impact of psychosocial factors on medication adherence living a gap in this regard.

Further, there are few if any research that explored the contributing factor of patient's beliefs and expectations in their medication taking behaviour in Ghana. The current research thereby

seeks to explore these variables among diabetic patients who report lower rate of adherence to aid in the holistic management of patients and to avoid major complications that result in medication non adherence in this populace. Also core to this study is that in chronic diseases, noncompliance with both lifestyle modification and medication regimens have been established as a major health problem (Miller, 1997). Patients are reported to frequently stop taking their medications because they consider them ineffective or because they experience unpleasant side effects. However, in asymptomatic conditions such as diabetes, patients may believe they do not need the medication and may not even refill their prescription (Miller, 1997). If they do however obtain the medications, they may forget to take them regularly. Therefore findings from this study will help inform clinicians and policy makers' strategies in delivering and improving policies that will ensure medication adherence among patients experiencing such asymptomatic condition.

Statement of Hypotheses

Based on the theories and studies reviewed, the following hypotheses will be tested:

1. Illness representations will significantly predict medication adherence among diabetic patients.
2. Psychological distress will significantly predict medication adherence among diabetics.
3. Spiritual coping will significantly predict medication adherence.
4. Illness representation will significantly predict psychological distress among diabetic patients.
5. Spiritual coping will significantly mediate the relationship between illness representation and medication adherence.

6. Demographic variables will significantly predict medication adherence among diabetics.

Conceptual Framework of the Study

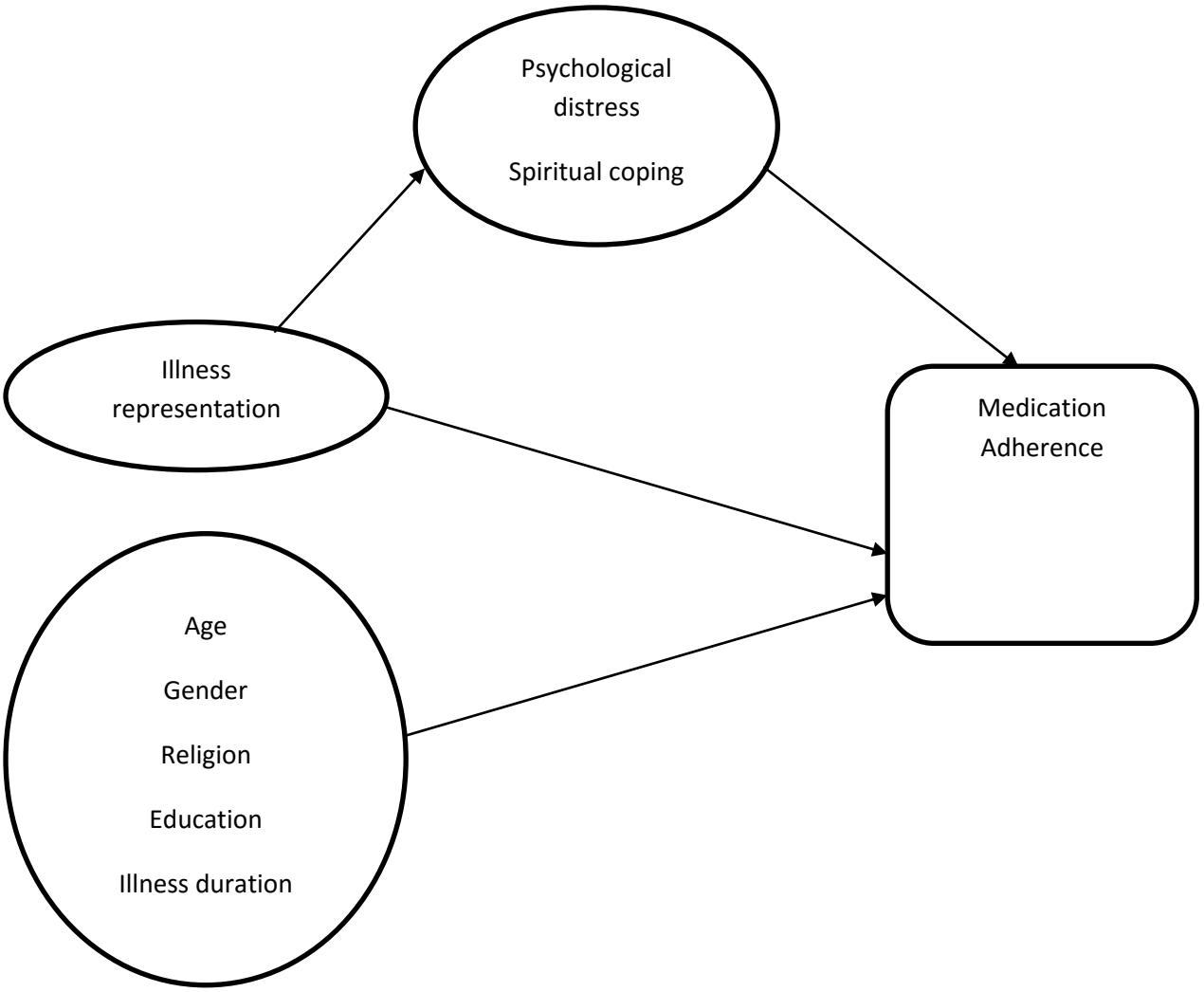

Figure 1: proposed conceptual framework of study hypothesis

From the Figure 1, it is hypothesised that illness representation, psychological distress and spiritual coping is hypothesised to individually predict medication adherence. Also illness representation is proposed to predict Psychological distress. Spiritual coping is hypothesised

to mediate the relationship between illness representation and medication adherence. Demographic variables are also hypothesised to significantly predict medication adherence.

Operational Definition of Terms

Illness Representation: individual patient's beliefs and expectations about diabetes disease.

Illness Representation Components: patient's representation of illness consequence, treatment control, personal control, timeline and emotional representations, illness consequence

Medication adherence: the patients self-reported measure of the extent to which patients take their prescribed anti diabetic oral medication and or insulin as prescribed by doctors.

Spiritual Coping: patients self-report measure of the extent to which patients rely on a supreme being to adapt or help solve problems related with diabetes.

Psychological distress: this refers to patients' overall level of anxiety, depression and stress.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter outlines the research methodology that was used to investigate the study variables as well as data collection. It includes descriptions of research setting, research design, population and sampling, sampling technique, followed by the materials that were used and procedure of data collection.

Research Setting

The research setting was the Tema General Hospital in the Tema Municipal Assembly of the Greater Accra Region. This hospital serves as the main point of referral in the Tema Municipal Assembly of the Greater Accra region that provides diabetic clinic to patients suffering from diabetes (Nuworza, 2014).

Population/Sample Size/Sampling technique

The population for this study were diabetic patients who sought anti-diabetic medical care at the above mentioned hospital. However, the target population were patients who were 18 years and above who had started taking anti-diabetic medication for at least six months in the fore mentioned hospital. In all, a total of 196 participants were sampled from this hospital. This sample size is adequate and based on the statistical test to be used which is mainly the regression analysis. According to Tabachnick & Fidell, (2007), the sample size for running regression analysis should be $N > 50+8m$, where N is sample size, and m is number of predictors. From this study, the sample size needed to be greater than 178(50+8(16)) hence the sample needed was obtained. Interested patients who met the criteria and reported at the diabetic clinics of the above mentioned hospital for medication refill on the set dates scheduled for data collection were recruited as participants for the study.

Sampling Technique

The purposive sampling technique was used in this research. This was used because there was a criterion to be met before sampling participants to be included in the research as described above. This included participants being at least 18 years of age, have started taking diabetes medication for at least 6 months. Due to lack of data on these criteria, the most feasible way of sampling was the purposive sampling technique where inclusion criteria had to be explored before sampling participants for data collection. Below gives a summary of the demographic background of participants in the study.

Table 1: Demographic data of sample for the study

Variable		Frequency	Percentage
Gender	**Males**	80	40.8
	Females	116	59.2
Religious affiliation	**Christian**	175	89.3
	Muslim	21	10.7
Educational background	**Low**	62	31.6
	Middle	73	37.2
	High	61	31.1

The Table 1 represent the demographic characteristics of sample for the research. It is observed that a high proportion of the samples are Christians. However this is reflective of the last population census conducted in the country and so high representation of the population data.

Inclusion Criteria

Participants who were included in this research were individuals who:

- Have been diagnosed with diabetes and were 18 years old and above as at the time of data collection.
- Have started taking diabetes drugs for at least six months as of the time for data collection.
- Could communicate in the English language.

Exclusion Criteria

The research excluded individuals who:

- Were below the age of 18.
- Were not on anti-diabetic medication for the past six months.
- Could not communicate in the English language.

Research Design

The study utilised a cross sectional survey. The survey is a procedure for collating information by asking some members of the target population a set of questions and then recording the responses. The cross-sectional survey was a suitable design since the research concentrated on studying same concept of the target population. This design was appropriate because it was not feasible due to resource constraints to assess and measure the entire mentioned population on the variables of interest in the study. Hence the researcher sought to assess a section of the diabetic patients receiving treatment on their illnesses representation, mental health and medication adherence at a given point in time.

Materials/instrument

Basically, the instruments used for data gathering were standardized scales in the form of questionnaires. The questionnaire comprised of the Revised Illness Perception Questionnaire (IPQ-R) by Moss-Morris, Weinman, Petrie, Horne, Cameron, and Buick (2002), Spiritual Coping subscale of the Africultural Coping System Inventory by Utsey et al. (2000), the Depression Anxiety Stress Scale 21(DASS-21) (Lovibond & Lovibond, 1995) and the Medication Adherence Report Scale (MARS-5) by Horne and Hankins (2004). There was a section that captured demographic variables such as age, educational background, gender, religious background, duration of diagnosis..

Illness Perception Questionnaire-Revised (IPQ-R)

Illness representation was measured with the Revised Illness Perception Questionnaire (IPQ-R). The IPQ-R was developed to measure and assess patient's beliefs and expectations about their illnesses. This scale was developed as an improvement of the original Illness Perception Questionnaire (IPQ) (Weinman et al., 1996), to improve the measurement properties of two of the subscales (i.e., cure/control and timeline) and to broaden the scope or the original IPQ (Moss-Morris, Weinman, Petrie, Horne, Cameron & Buick, 2002). The IPQ-R in total consists of 71 items divided into twelve subscales. In all, seven subscales were used in this current research. The scale was modified such that "diabetes" replaced "illness" whenever possible on the scale as suggested by the authors. The subscales used included treatment control 5 items (e.g., my treatment will be effective in curing my diabetes), personal control 6 items (e.g., There is a lot which I can do to control my diabetes), consequence 6 items (e.g., My diabetes is a serious condition), timeline cyclical (4items (e.g., My diabetes symptoms come and go in cycles), timeline acute/chronic 6 items (e.g., My diabetes will last a short time), illness coherence 5 items (e.g., I don't understand my diabetes) and emotional representation dimension 6 items (e.g. When I think about my diabetes I get upset). These

components showed good test-retest reliability in other studies, with correlations ranging from .46 to .88 and internal reliability or Cronbach's alphas for the original English version of IPQ-R ranging from .79 to .89 for the subscales (Moss-Morris et al., 2002). Some items on the scale were reverse-scored.

Medication Adherence Report Scale 5 (MARS-5)

Section C comprised of the Medication Adherence Report Scale 5 (MARS-5) by Horne and Hankins (2004). The MARS-5 was used to measure patient's self-report measure of adherence to their diabetes medication. The MARS-5 is a 5-item self-report scale for assessment of medication adherence or non-adherent behaviour. It's a 5-point Likert scale, ranging from 1= 'very often to' 5 = 'never. An example of item on the scale is 'I alter my dose'. A lower score on the scale indicates lower levels of adherent behaviour of medication. Cronbach's alpha for MARS-5 reported by Bäck, Sundell, Horne, Landén, and Mårdby (2012) was 0.66.

Africultural Coping Systems Inventory Subscale Spiritual Centred Coping

Section D was the Africultural Coping Systems Inventory (Utsey, Adams, & Bolden, 2000). There are four subscales which include cognitive debriefing, ritual coping, collective and spiritual centred coping. The spiritual coping was the subscale used to measure patient's level of spiritual coping. The Spiritual centred coping consisted of 8 items measured on a 4-point likert scale. Scoring was done by summing the responses to the items on the subscales assessed. The reported Cronbach's alpha was .79 for the spiritual centred coping subscale (Utsey et al., 2000). An example of an item on the scale is "Left matters in God's hands". Higher scores on this scale indicated higher usage of spiritual coping.

The Depression Anxiety Stress Scale 21 (DASS-21)

The last section which is section E was made up of the modified Depression Anxiety Stress Scale 21 (DASS-21) (Lovibond & Lovibond, 1995). The modification was done is such a way that items with words that was unpopular in the Ghanaian setting(e.g. feeling blue) was exchanged with a more common one. This was done as the pilot study showed a low reliability score of .51, with the modified version yielding a score of .94. The DASS 21 is a set of three self-report scales designed to measure negative emotional states of depression, anxiety and stress referring to the past week. Each subscale is made up of 7 items per scale scored on a 4-point scale ranging from 0 = did not apply to me at all, to 3 = Applied to me very much or most of the time. It has a reported Cronbach alpha on its subscale ranging from 0.70 for the Stress subscale to 0.88 for the overall scale (Tran, Tran & fisher, 2013). Raw scores were simply the sum of the item responses within a symptom domain. Higher scores indicated higher negative emotions on the particular scale of interest.

The Pilot Study

A pilot study was conducted to test the reliability of the questionnaires. In all, a total of 25 diabetic patients were sampled for the pilot study. The criterion for the pilot study was same as those set for the main study. Study participants for the pilot included 15 females and 10 males. Below is a summary of reliability for instruments used.

Table 2: Summary of Cronbach's Alpha for Study Instruments in the Pilot Study

Scales	Items in Scale	Cronbach's Alpha
IPQ -R Timeline Acute/Chronic	6	.90
IPQ -R Treatment Control	5	.60
IPQ -R Personal Control	6	.75
IPQ-R Illness Coherence	5	.74
IPQ-R Emotional Representation	7	.71
IPQ-R Timeline Cyclical	4	.64
IPQ-R Illness Consequences	6	.62
MARS-5	5	.92
Spiritual Coping	8	.80
DASS 21 Anxiety	7	.54
DASS 21 Depression	7	.52
DASS 21 Stress	7	.72

The scores of the reliability coefficients of the DASS subscales Anxiety and Depression were low. As such, items on the DASS that showed low reliabilities were replaced with more sensitive words for the main data collection.

Procedure for Data Collection

Ethical approval for the study was sought at the University of Ghana Ethics Committee for the Humanities (ECH). A copy of the certificate of approval and a letter of introduction taken from the Psychology Department was taken to the various research sites as proposed. Approval was given from the Tema General Hospital. A pilot study was then conducted on

25 participants to test for reliability of the test instruments. On the set dates of data collection, brief introduction of the research was given to patients about the research after their morning clinic meeting. Patients who showed interest in participating in the research as well as met the inclusion criteria were given written consent form to fill. The participants were assured of confidentiality of the information being released and that their responses would not be linked to their identities. They were then made to complete the questionnaire individually or read out to those who found it difficult to read. This process continued until all 200 participants completed their questionnaires.

Ethical Considerations

The current research followed ethical guidelines regarding the use of human participants in research. First and foremost approval was sought at the University of Ghana Ethics Committee for the Humanities (ECH). Also, institutional approval of the hospitals namely Korle-Bu Teaching Hospital, Tema General Hospital and the Ridge Hospital were sought. Of the three Hospitals that the researcher applied for approval only Tema General Hospital responded as of time of data collection. Participants were informed about the study's aim. Participation in the research was voluntary and participants were informed of freedom to withdraw and confidentiality of the information being obtained from them. Participants were also assured that their responses would not be linked to their identities and that information gathered will be used within the confinement of the research. The consent of participants was sought before participants were made to complete the questionnaire.

CHAPTER FOUR

RESULTS

Introduction

In this chapter, the researcher presents the results of the study from the analyses of the data gathered. Although 200 participants were included in the study, only 196 questionnaires were completed hence included in the analysis. This number is sufficient for the data analysis. Thus The SPSS version 20.00 was used in analyzing the data and series of statistical tests were performed including descriptive statistics which was used to summarize the data. The main statistical tests that were used to test the hypotheses were the Pearson product moment correlation coefficient and the hierarchical regression analysis.

Data Analysis Procedure

To ensure that the aim of the research was attained, the analysis was conducted in two main parts. The first part of the included descriptive statistics that focused on obtaining the summary of means and the standard deviations of the data gathered. Again, the Chronbac's alpha of the instruments used for data collection was performed to give an indication of the reliabilities of the measures used for the final data collection. Also included in the descriptive statistics was a correlation matrix done to establish the relationship that existed between study variables.

The second section of the analysis focused on the analysis of the hypothesis stated. In all, the seven hypotheses were analyzed with three different hierarchical multiple regressions. The hierarchical multiple regression analysis was deemed appropriate as the researcher sought to find out whether illness representation, psychological distress, spiritual coping and patients demographic variables could independently predict medication adherence as such the need to block these variables in steps to find out the relative contribution of these independent

predictors. Also the hierarchical multiple regression analysis was deemed appropriate to find out whether illness representation could independently predict psychological distress after controlling for other possible predictors such as patients demography and spiritual coping. Likewise, the hierarchical multiple regression analysis was again deemed appropriate to test the mediational role of spiritual coping in the relationship between illness representation and medication adherence.

Prior to conducing all hierarchical multiple regression, the relevant assumptions of this statistical analysis were tested. An examination of correlations (see Table 4) revealed that no two independent variables were highly correlated indicating that multicollinearity was also avoided. Again, on the collinearity statistics (i.e., Tolerance and VIF) were all within accepted limits, therefore, the assumption of multicollinearity was deemed to have been met (Coakes, 2005). An examination of the Mahalanobis distance scores also indicated no multivariate outliers existed in the data. Again categorical variables such as gender, religious affiliation, and educational background were dummy coded before analysis. For gender, the reference group was females which were coded 0 and males were coded 1. For religious background, Christianity was the reference group which was coded 0 and Islam was coded 1. For educational background secondary school education was the reference group with primary education coded 1 for the variable named primary and 0 for all other categories. Tertiary education was 1 for the variable named tertiary and 0 for all other variables. Details of the various analyses are presented below.

Descriptive Statistics

A preliminary analysis was conducted before the hypotheses testing. This analysis was done in two main stages. This included tests of reliability of measures, followed by summary means and standard deviations and lastly skewness and kurtosis for each of the study

variables to check for normality of the data. This was followed with correlation between the study variables.

Table 3: Means, Standard Deviations, Internal Consistency (Cronbach's alpha) and normality of the study variables

Variable	Mean	Std. Deviation	Min	Max	Alpha	Skewness	Kurtosis
Timeline Acute/Chronic	15.79	4.60	6	27	.92	.51	-.72
Timeline Cyclical	14.71	2.05	10	19	.83	-1.21	.15
Personal Control	22.46	2.70	13	28	.80	-1.15	.17
Consequences	19.03	3.36	12	30	.71	.60	.67
Emotional Representation	18.19	5.35	7	29	.91	.02	-1.15
Treatment Control	18.60	2.40	11	24	.72	-.62	.50
Illness Coherence	13.31	3.7	6	24	.82	.99	-.00
Medication Adherence	23.3	2.61	15	25	.86	-1.47	1.04
Spiritual Coping	9.88	6.35	0	24	.89	.24	-.98
Depression	6.09	5.06	0	20	.89	1.41	1.45
Anxiety	5.66	5.89	0	22	.81	1.24	.72
Stress	4.94	5.2	0	22	.85	1.30	1.47
Psychological distress	16.67	14.33	2	58	.94	1.42	1.5

Table 3 shows a summary of descriptive, reliability and normality coefficients. The scores of the measures reliabilities ranged from .71 to .94 which is in the acceptable range. Normality is thus achieved per the skewness and kurtosis values presented in Table 3.

The correlation coefficient of the relationship that exists among the study variables is presented in Table 4.

Table 4: Pearson Moment Product correlation matrix among the study variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
IPQ-R													
1. Acute	-												
2. Cyclical	-.19^{ns}	-											
3. P. Con.	-.31**	-.04^{ns}	-										
4. Conse.	.27**	.15^{ns}	-.41**	-									
5. Emo. R	.01^{ns}	.25**	-.31**	.37**	-								
6. T. Con.	-.48**	-.06^{ns}	.44**	-.19**	-.07^{ns}	-							
7. Coher.	.16^{ns}	-.64**	.06^{ns}	-.06^{ns}	-.25**	.16*	-						
8. Adher.	-.18^{ns}	-.01^{ns}	.60**	-.50**	-.43**	.14*	-.03^{ns}	-					
9. Spiri. C	-.04^{ns}	-.16^{ns}	.00^{ns}	.13^{ns}	.01^{ns}	.06^{ns}	.29**	-.14^{ns}	-				
DASS													
10. Dep	.21**	.17^{ns}	-18^{ns}	.33**	.30**	-.26**	-.28**	-.21**	.02^{ns}	-			
11. Anx	.26**	-.02^{ns}	-.11^{ns}	.31**	.20**	-.04^{ns}	-.03^{ns}	-.23**	.13^{ns}	.62**	-		
12. Stress	.14^{ns}	.09^{ns}	-.09^{ns}	.33**	.32**	-.07^{ns}	-.14^{ns}	-.21**	.07^{ns}	.79**	.71**	-	
13.P. Dis	.23**	.08^{ns}	-.14^{ns}	.36**	.30**	-.13^{ns}	-.17^{ns}	-.24**	.09^{ns}	.89**	.88**	.92**	-

Acute = Timeline Acute/chronic, Cyclical = Timeline Cyclical, P. Con. = Personal Control, Conse. = Illness Consequence, Emo. R = Emotional Representation, T. Con. = Treatment Control, Coher. = Illness Coherence, Adher. = Medication Adherence, Spiri C. = Spiritual coping, Dep = Depression, Anx = Anxiety, P. Dis = Psychological Distress. *Significant at .05 level of significance **Significant at the .01 level of significance

Hypotheses testing

In all, the seven hypotheses were tested with the Pearson moment coefficient correlation and the hierarchical multiple regression analysis. Details of the various analyses are presented below.

Illness Representation, Psychological Distress, Spiritual Coping and Demographic variables as Predictors of Medication Adherence

One of the main aims of this research was to examine whether illness representation, psychological distress, spiritual coping and patients demographic variables could independently predict medication adherence. To do this, it was hypothesised that "illness representations, psychological distress, spiritual coping and demographic variables will independently and significantly predict medication adherence among diabetics". This was analysed with the hierarchical multiple regression analysis. The predictors were entered in such a way that demographic variables (gender, age, illness duration, educational status and religious affiliation) were entered in step one, illness representation components entered in step two, spiritual coping in step 3 and psychological distress entered in the final step.

The analysis showed a significant overall regression results, [R^2 = .539, F (15, 180) = 14.00, ρ < .05]. That is, the entire model explained about 53.9% of variance in the level of medication adherence among diabetic patients. A summary of the analysis is presented in Table 5.

Table 5 : Results showing the effects of demographic variables, illness representation components, spiritual coping and psychological distress in predicting medication adherence

Predictors	**B**	**SEB**	**β**	***t***	***p***	ΔR^2
Model 1						.02
Age	.00	.01	.02	.26	.80	
Illness duration	.04	.02	.12	1.96	.05	
Gender	.10	.28	.02	.34	.73	
Religion	.31	.45	.04	.68	.50	
Tertiary education	-.63	.34	-.11	-1.85	.07	
Primary education	.30	.34	.05	.87	.39	
Model 2						.52**
Acute	.00	.04	.01	.10	.92	
Cyclical	.01	.09	.01	.09	.93	
Personal Control	.48	.06	.50	7.97	.00	
Consequence	-.20	.05	-.26	-4.12	.00	
Emotional Representation	-.11	.03	-.23	-3.73	.00	
Treatment Control	-.12	.07	-.11	-1.69	.09	
Illness Coherence	-.08	.05	-.12	-1.55	.12	
Model 3						.01
Spiritual Coping	-.03	.02	-.07	-1.22	.23	
Model 4						
psychological Distress	-.01	.01	-.06	-1.04	.30	.00

Note. R^2 = .02, (p = .051) for Step 1; ΔR^2 = .52, (*p* =.00) for Step 2; ΔR^2 = .01, (*p* =.18) for Step 3; ΔR^2 = .00, (*p* =.30) for Step 4 ***p* < .01

Patients' Demographics and Medication Adherence

In step 1, Demographic variables (gender, age, illness duration since diagnosis, educational background and religious affiliation) were entered in the first block of the hierarchical regression analysis. The summary of results in the Table 5 indicates that that demographic variables did not significantly predict any significant variance in medication adherence among this populace [R^2 = .02, F (6, 189) = .49, ρ = .82]. Again from Table 5, observing the beta coefficients none of them was significant. Hence, the hypothesis stating that "patients' demographic variables will significantly predict medication adherence" was not supported.

Illness Representation and Medication Adherence

In the step 2, where illness representation components were entered, a significant regression model emerged, [ΔR^2 = .52, ρ = .00, step 2]. Thus, illness representation in general accounted for a significant 52% of the variance in medication adherence. The illness representation components that were independent predictors of the level of medication adherence in this sample were the representation of personal control [β = .50, t = 7.97, ρ < .05], the representation of consequence, [β = -.26, t = -.4.12, ρ < .05] and emotional representation of the illness [β =-.23, t = -3.77, ρ < .05]. Therefore, the hypothesis that "Diabetic patients' illness representations will significantly predict their level of medication adherence" is supported.

Spiritual Coping and Medication Adherence

To establish whether spiritual coping could significantly predict medication adherence, spiritual coping was entered in step 3 of the hierarchical multiple regression analysis. The results presented in Table 5 indicate that spiritual coping did not significantly predict medication

adherence [ΔR^2 = .01, ρ = .18, step 3]. Hence the hypothesis stating that "spiritual coping will significantly predict medication adherence" is rejected**.**

Psychological Distress and Medication Adherence

Psychological distress was entered in step 4 after controlling for demographic variables, illness representation and spiritual coping. From Table 5, it is observed that psychological distress did not account for a significant variance in the level of medication adherence among diabetic patients [ΔR^2 = .00, ρ = .30, step 4]. Hence, the hypothesis that "psychological distress will significantly predict medication adherence among diabetics" is again not supported.

Illness Representation as a Predictor of Psychological Distress

Also central to the research was to establish whether or not illness representation could predict psychological distress. To do this, it was hypothesised that "illness representation will significantly predict psychological distress". This was tested with the hierarchical multiple regression analysis. This was analysed with the hierarchical multiple regression analysis as the researcher sought to find out whether illness representation could independently predict psychological distress after controlling for other possible predictors such as patients demography and spiritual coping. The predictors were entered such that, the demographic variables (gender, age, illness duration, educational status and religious affiliation) were entered in the step 1, spiritual coping in step 2 and finally illness representation components entered in the step 3.

In all, a significant model emerged [R^2 = .23, F (14, 181) = 5.07, ρ < .001]. That is, the entire model (illness representation components, demographic variables and spiritual coping) significantly explained about 23% of variance in the level of psychological distress among

diabetic patients. The summary of the results of the hierarchical regression analysis is presented in Table 6.

Table 6: Hierarchical Multiple Regression analysis showing the illness representation components as a predictor of psychological distress

Predictors	B	SEB	β	*t*	*p*	ΔR^2
Model 1						.07*
Age	-.22	.09	-.19	-2.56	.01*	
Illness duration	.18	.13	.10	1.32	.19	
Gender	.22	1.90	.01	.12	.91	
Religion	7.76	3.04	.17	2.55	.01*	
Tertiary education	-1.25	2.33	-.04	-.54	.59	
Primary education	.92	2.32	.03	.40	.69	
Model 2						.00
Spiritual Coping	.25	.16	.11	1.55	.12	
Model 3						.21**
Acute/Chronic	.73	.25	.24	2.92	.00**	
Timeline Cyclical	-.68	.60	-.10	-1.13	.26	
Personal Control	.59	.41	.11	1.42	.16	
Consequence	1.06	.33	.25	3.24	.00**	
Emotional Representation	.46	.20	.17	2.32	.02*	
Treatment Control	.25	.48	.04	.51	.61	
Illness Coherence	-1.09	.35	-.28	-3.10	.00**	

Note. R^2 = .07, (p = .03) for Step 1; ΔR^2 = .00, (p =.42) for Step 2; ΔR^2 = .20, (p =.00) for Step 3. * p <.05 **p<.01

In model 1 of Table 6 which included the demographic variables, the model was significant [ΔR^2=.07, ρ=.03, step 1]. Indicating that, demographic variables significantly predicted psychological distress. However, looking at the Beta coefficients only Age (β=-.19, p=.01) and Religion (.17) were independent predictors of psychological distress.

However, from the observation of Model 2 in Table 6 where spiritual coping was entered in the analysis, the model was not significant indicating that spiritual coping did significantly predict psychological distress [ΔR^2 = .00, ρ = .42, step 2].

All the illness representation components were entered as predictors of medication adherence in Model 3. It is observed that illness representation components alone accounted for a significant 20% variance in psychological distress [ΔR^2 = .20, ρ = .00, step 3]. Therefore the hypothesis that stated that "illness representation will significantly predict psychological distress" was supported.

Spiritual Coping as a Mediator of Illness Representation and Medication Adherence

Another aim of the researcher was to find out if spiritual coping could possibly serve as pathways through which illness representation relates with medication adherence. To test this it was stated that, "spiritual coping will significantly mediate the relationship between illness representation and medication adherence among diabetic patients". In a mediation model, the effect of an independent variable on a dependent variable is transmitted through a third intervening, or mediating, variable. According to Baron and Kenny (1986), for meditational effects, there are four conditions to be met and these are that, the total effect of the independent variable (illness representation) on the dependent variable (medication adherence) must be significant. Again the effect of the independent variable (illness representation) on the mediating

variable (spiritual coping) must be significant. Also the effect of the mediator (spiritual coping) on the dependent variable (medication adherence), controlled for the independent variable (illness representation), must be significant. Lastly, a direct effect of the independent variable (illness representation) on the dependent variable (medication adherence) adjusted for the mediator (spiritual coping) must be non-significant or significantly reduced. However from hierarchical regression results presented in Table 5, the mediator (spiritual coping) did not significantly predict the dependent variable (medication adherence) [ΔR^2 = .01, ρ = .18, step 3]. Hence, that rule was flouted and the hypothesis that stated, "Spiritual coping will significantly mediate the relationship between illness representation and medication adherence among diabetics" is therefore rejected out rightly without running further analysis.

Summary of Results

In a nutshell the results in the study showed that, Illness representation significantly predicted variance in medication adherence among diabetes patients. However, Psychological distress, Spiritual coping and demographic variables (age, gender, educational status, duration since illness diagnosis, religious background) did not predict any significant variance in medication adherence among diabetics. Illness representation again accounted for a significant variance in psychological distress among diabetes patients. Spiritual coping did not mediate the relationship between illness representation and medication adherence among diabetes patients.

Additional findings

- Illness representation components (Illness representation components (personal control and treatment control) were positively correlated with medication adherence among diabetes patients.

- Illness representation components (illness coherence and cyclical timeline) were not related with medication adherence among diabetes patients.

- Depression, stress anxiety and overall psychological distress were weakly and negatively correlated with medication adherence among diabetes patients.

Observed Model

Illness representation components

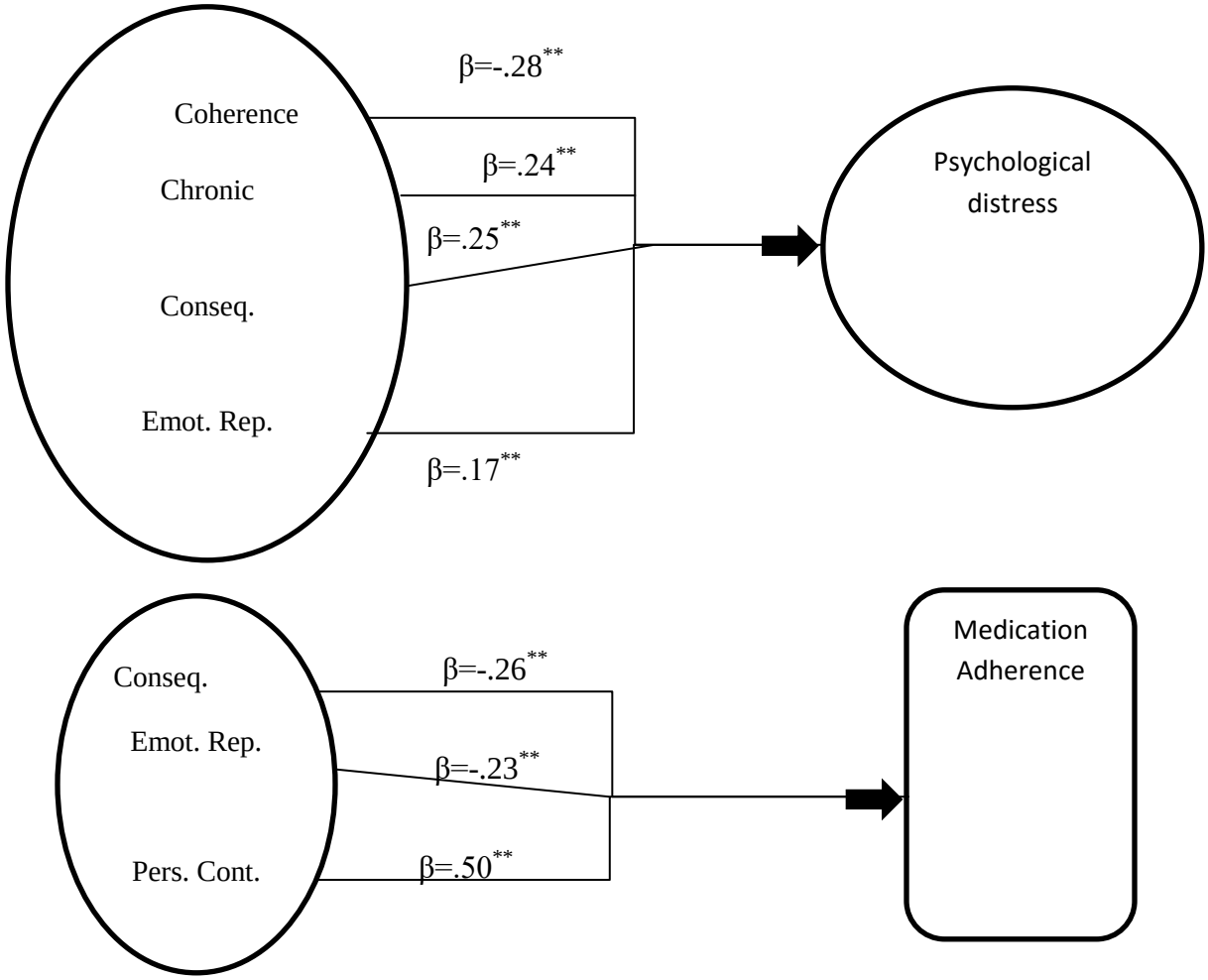

Figure 2: observed model of study findings

From the above model presented in figure 2, it is showed that illness representation predicted medication adherence as well as psychological distress. Spiritual coping, demographic variables and psychological distress were found not to significantly predict medication adherence. Also psychological distress and spiritual coping did not mediate the relationship between illness representation and medication adherence.

CHAPTER FIVE

DISCUSSION

Introduction

Chapter five discusses the findings from the current research in relation to theories that guided the current work and related work done in this area of research. The explanations of the possible reasons for the findings are offered to put the outcomes into perspective and that which may be accounting for the results observed. Again, the chapter outlines the limitations encountered in the study as well as recommendations for future research in this area. Lastly, implications for clinical practice for utmost diabetes management are further discussed before a summary of study conclusion.

Summary of Study Findings

The purpose of this study was to explore how diabetic patients representation of their illness, psychological distress and the use of spiritual coping impact on their medication adherence. It was predicted that illnesses representation, psychological distress spiritual coping and medication adherence will significantly predict medication adherence among diabetic patients. It was further explored to determine whether illness representation will predict psychological distress among diabetic patients and whether or not spiritual coping would mediate the relationship between illness representation and medication adherence. The results of the study indicated that illness representation significantly and independently predicted medication adherence. Again, illness representation significantly and independently predicted psychological distress. However, it was found out that spiritual coping, psychological distress and demographic variables did not predict medication adherence. Lastly, spiritual coping did not

mediate the relationship between illness representation and medication adherence. In-depth discussions of study findings are further presented.

Demographic variables and medication adherence

The findings of the study indicated that none of the patients' demographic variables (age, gender, religion, educational background and illness duration) predicted medication adherence. Demographic variables did not predict a significant variance in medication adherence. This study is consistent with the study by Jacobs et al. (2014), who assessed personal beliefs about the causes and meaning of having diabetes among members of the Lumbee Indian tribe living in rural southeastern North Carolina. Again, the researchers sought find out whether age and gender differences exist in medication adherence. In their findings, no significant differences were found for age (over or less than 50 years) or gender. That is differences in medication adherence were not observed in this present study. In the findings by Horne and Weiman (2002), they found out that, socio-demographic and clinical factors explained only a small amount of variance in adherence. Although in the present study such variables did not account for any significant variance in adherence. However, in the study by Ross et al. (2004) that explored beliefs about hypertensive patient's illness and medication usage using the self-regulatory model, findings indicated that compliance was significantly influenced by age and gender. Thus older patients were more compliant than younger patients as well as women compared with men. The findings of the current study could be due to unbalanced composition of the various groups of people based on these demographics measured. This difference in finding may also be attributed to difference in disease experienced by patients as well as the differences in measures used in assessing compliance per the different studies reviewed. However, in the reviewed study that

explored the variables among diabetics also found patients demographic variables as not a significant predictor of medication adherence.

Illness representation and medication adherence

In exploring the relationship between illness representation and medication adherence, the findings indicated that illness representation components: illness consequence, chronic timeline and emotional representation were negatively correlated with medication adherence among diabetes patients. On the other hand, personal control and treatment control were positively correlated with medication adherence. However, no significant correlation existed between cyclical timeline and medication adherence as well as between illness coherence and medication adherence. Overall, illness representation components that predicted medication adherence were personal control, illness consequence and emotional representation. Elaboration of the findings is indicated below.

Illness consequence and medication adherence

The finding of the study suggests that illness consequence thus patients representation of the negative impact of their condition on their lives significantly and negatively predicted medication adherence. This finding suggests that diabetic patients who believe their illness has negative effects on aspects of their life such as their finances, relationship with others as well as personal life tend to have lower adherence to their diabetic medications compared to those who represent fewer consequences. This could be explained with the learned helplessness theory which suggests that individuals who experience severe stressful situations tend to learn that nothing can be done about their condition and sort of give up trying to deal with the situation. So in the case of medication adherence, it can be argued that, people who experience higher diabetes consequences also do not take their medication likely because they have come to believe or

learn that no action of their own will influence the impact of diabetes on their lives as the disease is chronic. This finding is consistent with the study by Ross et al. (2004) who found that lower illness consequences were rather positively associated with medication adherence. Thus those who had perceived lower consequences of their disease did adhere to their medication compared with those who perceived higher consequences. As well, it was found in their study that, among illness representation components, consequence was among the most predictive component on compliance in their sample. Also Horne and Weiman (2002) found that non-adherent behaviors were associated with more negative perceived consequences of illness. Other studies found contradictory results, (Jacobs et al., 2014) where a higher illness consequence was a good predictor of medication adherence. These differences in findings may be accounted for by the differences in illness experiences as well as measure of adherence. This present finding therefore suggests that higher disease consequence leads to lower adherence.

Timeline acute/Chronic and medication adherence

The study finding demonstrated that, representation of diabetes as chronic was negatively associated with medication non-adherence. That is, as patients represent that their condition will be with them for a longer period of time, they usually do not take their prescribed medication. This study is also consistent with the study by Mosleh and Almalik (2014) who found that patients who perceived their condition as being of short duration were more likely to adhere to prescribed medication and other recommendations than those who perceived it as being of a longer duration. That is chronicity was associated with non-adherence. Also the learned helplessness theory can help explain or understand why representation of chronicity also is negatively related with medication adherence. Thus, those who perceive that, their illness will be with them for the rest of their life also likely believe or represent their symptoms as being static

and that symptoms will remain the same regardless of medication taking or not. Hence, low medication adherence rate is subsequently observed.

Treatment control and medication adherence

Also it was shown that a significant and positive relationship exist between treatment control and medication adherence. This means that as individuals believed their diabetic medication to be effective in managing their health condition the more they used their medication as recommended. This finding is consistent with the studies by Maclnnes (2013) and Ross et al. (2004) who found in their studies that, high-treatment control beliefs were associated with high compliance. Kim and Evangelista (2010) also found that, as higher treatment control beliefs increases, non-adherent to their diet restrictions decreased in their study of patients undergoing renal treatment. Mosleh and Almalik (2014) in their study among coronary heart disease patients found that, treatment control was an independent predictor of medication adherence in their populace. That is, patients who have higher belief that treatment is effective to help manage their condition will usually take their medication because they expect or believe that the medication is useful in managing their condition compared with those who belief that treatment is not effective in managing their condition. Therefore patient's representation of the benefits of medication in controlling their disease can be said to be a motivation force for the continual medication adherence.

Emotional representation and medication adherence

The negative impact of emotional representation on medication adherence observed in this study could be explained. Higher emotional representation of diabetes indicates the disease induces high negative feelings such as anger, fear, sadness which are all negative. These negative emotions of the illness may distress which also tolls down on the individual resource in dealing

with the condition. The emotional representation may therefore generate emotional, physiological and behavioral reactions that influence the medication adherence of individuals living with diabetes mellitus. Thus these negative emotions in a way impede medication to be taken. A similar finding was also observed in the study by Ross et al. (2004) who also found a significant negative relationship between emotional representation and medication adherence.

Personal Control and Medication Adherence

Personal control predicted the greatest variance among the illness representation components in medication adherence among diabetics. This indicates that, people who believe their actions can influence the course of their illness are likely to take their medication as well. Similarly, in a study conducted among coronary heart disease patients, Mosleh and Almalik (2014), explored patients' illness beliefs concerning coronary heart disease and whether these beliefs could predict adherence to healthy behaviors. Results revealed that personal control emerged as an independent predictor of medication adherence. This finding could be due to the fact that, patients who had strong beliefs in their ability to control the disease or ability to influence their coronary heart disease (personal control), were more motivated and as such more adhere to prescribed medication and other recommendations. Rozema et al. (2009) found that personal control had a significant positive relation with problem-focused. Medication adherence in this study can be described as a form of problem-focused coping where patients take active measures such as taking the recommended medication to control their diabetes.

This finding also emphasize the theory of planned behavior which states that that perceived behavioral control do have a direct influence on intention and that for desirable behaviors, greater perceived behavioral control should lead to stronger intentions (Kraft et al., 2005). That is, patients with higher perceived behavioral control are likely to try harder and to persevere far

longer than one with lower perceived control which may explain such higher levels of adherence as well. Also, it is asserted that positive beliefs of patients 'control may improve patients' sense of self-efficacy (Lau-Walker, 2004) as well as problem-focused coping strategies which may bring about positive adaptive outcomes (Hagger & Orbell, 2003). However, in the study by Ross et al. (2004), lower personal beliefs control was rather associated with higher adherence. This suggests that, the disease experience could be the defining factor for the direction of the relationship between control beliefs and adherence. Generally diabetes is usually associated with individual lifestyle including diet and hence personal control beliefs relating positively with adherence. Again is shown that people's behaviors are strongly influenced by their confidence and believe in their personal ability to perform it (Sniehotta, 2009).

Illness coherence, timeline cyclical and medication adherence

The finding of the study indicated that illness coherence did not significantly relate with medication adherence nor did it independently account for a significant variance in medication adherence. Thus, in this study, patients' understanding of their diabetes did not relate with their adherence to their recommended medications. A similar finding was established by Woith & Larson (2008) as no significant relationship was observed between illness coherence and delay in seeking treatment or adherence among patients undergoing Tuberculosis treatment. However, MacInnes (2013) found that illness coherence was found to be moderately correlated with self-care. This difference in finding could be that, in the study by MacInnes (2013), self-care was measured generally not limited to medication adherence as it was measured in this study and in the study by Woith and Larson (2008). The study outcome suggests that the representation of the disease being cyclical or seasonal did not significantly relate with medication adherence. This

could be due to the fact that patients did not endorse diabetes to be cyclical due to asymptomatic natures in its manifestation and hence the no association with medication adherence.

Psychological distress and medication adherence

The findings of the research indicated that, outcomes of psychological distress which included stress, anxiety and depression were significantly and negatively related with medication adherence. Thus, as psychological distress increases medication adherence decreases. However, in the regression analysis done due to the high correlation between the three indicators of distress, the total measure was included in the model which didn't predict any significant variance in medication adherence. This finding contradict the study by Dempe et al. (2013) that aimed to evaluate the influence of simultaneous depressive and anxious symptoms on medication adherence in patients with stable coronary artery disease (CAD). They found out that depressive and anxious symptoms were independently associated with medication non-adherence. Thus, people who were experiencing depressive and anxious symptoms had higher likelihood of being non-adherent than those not experiencing these symptoms with patients experiencing both symptoms worse adherent to their medication.

However, Kretchy et al. (2014) in a study that sought to ascertain the prevalence and role of stress, anxiety and depression on anti-hypertensive medication adherence established that, stress among patients but not depression or anxiety was the psychological distress indicator that increased the likelihood of medication non-adherence. From this finding it can be explained that psychological distress didn't predict medication adherence probably because of the way and manner in which all three indicators were combined in the analysis without differentiating the dimensions of distress. Also it is possible that there are certain cultural moderating variables that

are influencing the relationship between psychological distress and medication adherence as such the need for further exploration

Spiritual coping and medication adherence

The findings of the study indicated that spiritual coping did not significantly predict medication adherence. Consistently, in a longitudinal study by Henry (2013), to examine whether spiritual coping (SC) was related to medication adherence, SC was not significantly related to medication adherence at baseline as well as over time. Again, Berman, Merz, Rudnick, Snyder, Rogers, Lee, et al. (2004) in an attempt to provide an examination of the relationship between the religious beliefs and spirituality of patients on adherence to hemodialysis (HD) therapy , it was found out no significant relationship existed between spirituality and adherence in their population determined by using all 3 spirituality scales. This finding however contradicts the study by Kretchy et al. (2013), who sought to examine the interrelationship between spirituality, religiosity and medication adherence among hypertensive patients in two tertiary hospitals in Ghana. The findings of the study indicated that, spirituality, but not religiosity, was associated with medication non-adherence, although patients exhibited high levels of both spirituality and religiosity.

Wanyama et al. (2007) believed that usually chronic disease patients knowing that their disease is chronic and in most cases incurable with medication per the nature of their sickness tend to believe in God or a Supreme Being for possible healing, thereby possibly reducing their level of personal control hence less likely to take their medication. However in the current study no significant association was found between personal control and spiritual coping which may be due to some items on the spiritual coping scale measuring collective religious coping where participants sought for prayers from religious group members or pastors which might have

influenced the findings of the current results. Thus the differences in results are possibly accounted for by differences in measures used in the various researches.

Illness representation and psychological distress

It was proposed that illness representation will significantly predict psychological distress. This hypothesis was supported with illness representation components lower coherence, higher consequence, higher emotional representation and more chronic view of diabetes predicting higher levels of distress. That is patients who understood the course of their illness experienced lower level of distress. This could be due to the fact that understanding reduces uncertainties which reduce level of disruptions experienced. A better understanding of diabetes is thus associated and fewer negative emotions associated with the disease (Searle et al., 2007). It is also possible that health anxiety is reduced with increasing understanding which reduces illness distress in general. The finding is consistent with the study by McCabe et al. (2011) who described illness beliefs in patients with recurrent symptomatic atrial fibrillation (AF) and the relationships among illness beliefs having implications for self-management. Findings of their study indicated that Subjects reporting a good understanding of AF endorsed fewer negative emotions related to AF. Again a similar finding was observed by Paddison et al. (2010) who studied the relationship among diabetes patients.

Again it was found out that in the current study that illness representation component "higher consequence" predicted higher levels of psychological distress among the study participants. This means that patients who perceive negative impact of diabetes also experiences higher levels of psychological distress. This may not be surprising as the evaluation of a stressor as taxing put extra toll on the individual inducing higher levels of disruption hence the distress experienced. Further, the study by McCabe et al. (2011) showed that greater consequences were associated

with more negative emotion which is consistent with the current study. In another study by Paddison et al. (2010), the researchers examined the relationship between illness perceptions and illness-related distress among adults with type 2 diabetes. Multiple regression analyses controlling for age and clinical characteristics indicated that, higher distress about diabetes was associated with a perception that diabetes has serious consequences, difficulties 'making sense' of diabetes. That is lower coherence and higher consequences were associated with higher distress. The study indicated the relevance of illness representation on distress.

In addition, the results indicated that higher emotional representation induced higher distress in patients. That is the evaluation of illness that induces fear, anger, sadness among other negative emotion induced higher levels of distress experienced by patients. This negative emotional evaluation does continually tax the individuals resources of coping which not dealt with leads to exhaustion hence the higher levels of distress experienced by these people. This finding is in line with other studies (McCabe et al., 2011; Paddison et al., 2010).

Also the representation of diabetes as having a chronic timeline was found to predict higher levels of psychological distress in this sample. This finding could be due to the knowledge of the extra duties and recommendations required to live with diabetes which patients may regard as overwhelming which when not dealt with appropriately results in the stress, anxiety and depression symptoms experienced. Also the extra self-care activities required including medication, diet, physical activities and lifestyle change possibly make the perception of illness as chronic as dreadful and as such the distress experienced. Consistently, Heyhoe and Lawton (2009) examined the illness beliefs of patients with interstitial cystitis (IC) and their experience of psychological distress using the mixed method approach at a UK hospital. Pearson's

correlation revealed that consequences, illness coherence, emotional representations and chronic timeline were significantly related with psychological distress.

Spiritual coping as a mediator between illness representation and medication adherence

Leventhal's (1980) model is a mediational one, which proposes that illness beliefs lead to coping responses, which in turn, influence health outcomes. From this, it was proposed that, the effect of representations of diabetes on medication adherence would be mediated by spiritual coping. This hypothesis was rejected indicating that spiritual coping was not a mediator between illness beliefs and medication adherence. Spiritual coping was not even found to relate or predict medication adherence. The study is consistent with the findings by Searle et al. (2007), who found that coping cognitions did not mediate the relationships between illness representations and coping behaviors which in their study included medication adherence. Likewise, the study is consistent with the findings by Brown et al. (2007) who sought to test the applicability and utility of Leventhal's model of illness cognition in a sample of depressed primary care patients. They tested the mediating effects of coping behaviors. To do this, data were obtained from 191 primary care patients receiving antidepressant medication for the treatment of depression. The results indicated that coping behavior did not mediate the relationship between illness beliefs and physical functioning. This results could be due to the reason that medication adherence can be view as a form of problem focused coping in itself hence the reason for this finding.

Again, evidence by Searle et al. (2007) demonstrates that that coping strategies and illness beliefs may be distinct mechanisms which exert their influence on health outcomes independently which may account for the finding in the current study. As well, coping in this study was limited to spiritual coping which did not relate with medication adherence in this study hence producing the observed finding.

Recommendations

The study recommendations are categorized under two main subheadings. These are (i) Future Studies and (ii) clinical implications.

Future Studies

Although this study has added to knowledge in the area of medication adherence and fills some gaps in diabetic research or chronic illnesses, it may serve as a good basis for future studies. Future studies should consider adherence to other recommendations such as diet and exercise which forms part of diabetic management. This will help understand whether different health behaviors are represented differently among diabetics. Also research in this area should consider increasing sample size of participants as well as draw sample at different sites to allow for generalization of research findings. Again, future research should consider measuring spiritual coping as an individual experience and if possible an in-depth study using a qualitative design to explore the pathways through which spiritual coping may influence adherence behavior in this populace. Future research in this area should also focus on designing interventions based on patients' beliefs and its effects on adherence and wellbeing. As the level of adherence measure is a self-report measure by patients and not actual independent observations of taking ones medication, future research should consider the use of multiple informants of adherence or outcome of adherence such as blood sugar level as indicative of a measure of adherence, pharmacy records and pill count among others. Future studies should also examine the role of other forms of coping with the diabetes on medication adherence of the patients.

Clinical Implications

The study has some implications in the care of diabetic patients by health professionals who give this care. The findings of the study give credence to the fact the individual's cognitive

appraisal of their illness is important in the management of chronic illness. The study implies that patients have their own beliefs and expectation of their disease aside what is told to them by health professionals. And these beliefs and expectations held are shown to influence the rate at which they take their medication as well as their level of psychological distress. First and foremost key attention should be paid by health professionals to the representation of diabetes by patients as it was found that their illness representation significantly predicted the level of psychological distress (stress, depression and anxiety) and medication adherence. Thus, the diabetic patient's cognitive and emotional beliefs and expectations of their illness should be given enough attention for utmost management of the disease among patients aside what is already done. The results of the current study show that, for higher adherence among diabetics, higher personal control of diabetes, lower consequences and emotional response needs to be achieved. Thus, diabetics, who doubt their ability to control their illness, represent higher disease consequence and hold higher levels of negative emotions of their disease are less likely to follow their recommended medications. In either case, interventions should be directed at challenging these dissonant beliefs for which its presence impedes their disease management. Interventions should be directed at empowering patients to take maximum control over their illness believing that their actions could improve their condition above their disease consequences.

As observed, patients with representation as chronic although aligns with the medical model of diabetes is associated with non-adherence and psychological distress. As such patients should be educated to understand the essence of medication in controlling their symptoms when taken appropriately. Also their negative emotional representation should not be left unattended but dealt with in therapy and replaced with more positive emotional representations. Also the study has demonstrated that diabetic patients' experience of psychological distress ranging from

depression, anxiety, and stress is negatively related with their level of medication adherence. As such intervention for maximum disease management specifically adherence should incorporate mental health care. This thereby requires the services of health or clinical psychologists to make management holistic. Thus patients should be assessed occasionally and where the need be, treatment should be meted out for effective disease management.

This finding also provides empirical evidence to support the significance of the distinction between personal control and treatment control in understanding the influence of illness representation on patient adherence behavior (Moss-Morris et al. 2002). Thus patients should not be oriented only on how effective their medication are in managing their disease but should also include the essence of their own belief in their own ability to control their disease and how this empowers them to take the needed recommended actions. This again has important implications for the routine practice of some health care professionals, who frequently rely on the threat of complications and chronicity as their tool to motivate patients for improved self-care patients. Clearly this strategy is not helpful and, given the results of this study on illness beliefs, the results may well be counterproductive for patients.

Limitations

Just as every research has its flaws, this one was not an exemption. One short coming of the current research was that, the sample was selected from one site in the Tema Municipal Assembly due to the inability of the researcher to access the other hospitals as proposed. Thus, only one hospital was able to grant the permission within the time available and this limited the sample selection. As such generalization is limited to this study setting. Findings of the study are correlation in nature so causal inferences cannot be made and as such the need to explore the variable using in-depth methods

Conclusion

This study as predicted helped in filling the knowledge gap in relation to establishing an association between illness representations, psychological distress as well as spiritual coping on medication adherence among diabetics in Ghana and by extension sub-Saharan African. The study outcomes demonstrate that higher personal control beliefs, lower emotional representation, and lower illness consequences significantly increases medication adherence among diabetics while high usage of spiritual coping is related negatively to medication adherence. Moreover, stress, anxiety and depression were all negatively associated with medication adherence. However, psychological distress did not predict a significant variance in medication adherence. The study therefore suggests that patients' beliefs and expectations of their illness especially beliefs of their personal control of diabetes, the representation of illness consequences of the disease on patients, and the negative emotional representation of disease predict the rate at which patients will take their medication. Again the representation of coherence, consequence, chronicity and emotional representation predict psychological distress among patients. It is thus imperative for health professionals to be holistic in their approach to healthcare by taking into consideration the importance of the patients own representation of their disease, their level of psychological distress in terms of stress, anxiety and depression while providing care for diabetic patients.

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APPENDICES

APPENDIX 1

QUESTIONNAIRE

UNIVERSITY OF GHANA

DEPARTMENT OF PSYCHOLOGY

Dear Respondent, this questionnaire is designed to investigate the relationship among beliefs, distress, coping and adherence among patients living with Diabetes. This research is being conducted in partial fulfilment for the award of a Master of Philosophy Degree in Clinical Psychology at the University of Ghana. Information given will therefore be treated very utmost confidentiality. Your participation would be greatly appreciated.

SECTION A: DEMOGRAPHIC DATA

Please respond to the following **by making a tick (ˣ) in the space provided beside the answer or writing out the response that best describes you** or applies to you.

GENDER: 1. Male ( ) 2. Female ( )

Age…….

Number of Years Since Diagnosis: ……..…….

Religion: 1. Christian ( ) 2.Muslim ( ) 3.Traditionalist ( ) 4.others ( ) ……

Education: 1.No Education- Primary ( ) 2.Secondary ( ) 3.Tertiary ( )

SECTION B: IPQ-R

We are interested in your own personal view of how you now see or think about your diabetes. Please indicate how much you agree or disagree with the following statements about your diabetes by **CIRCLING** the appropriate **NUMBER** in the box that correspond with your answer.

	VIEWS ABOUT YOUR Diabetes	**Strongly Disagree 1**	**Disagree 2**	**Neither Disagree nor Agree 3**	**Agree 4**	**Strongly Agree 5**
1	My diabetes will last a short time	**1**	**2**	**3**	**4**	**5**
2	My diabetes is likely to be permanent rather than temporary	**1**	**2**	**3**	**4**	**5**
10	My diabetes have serious financial consequences	**1**	**2**	**3**	**4**	**5**
4	This diabetes will pass quickly	**1**	**2**	**3**	**4**	**5**
9	My diabetes strongly affects the way others see me	**1**	**2**	**3**	**4**	**5**
6	My diabetes is a serious condition	**1**	**2**	**3**	**4**	**5**
7	I get sad when I think about my diabetes	**1**	**2**	**3**	**4**	**5**
16	I have the power to influence my diabetes	**1**	**2**	**3**	**4**	**5**
5	I expect to have this diabetes for the rest of my life	**1**	**2**	**3**	**4**	**5**
3	My diabetes will last for a long time	**1**	**2**	**3**	**4**	**5**
11	My diabetes causes difficulties for those who are close to me	**1**	**2**	**3**	**4**	**5**
20	My treatment will be effective in curing my diabetes	**1**	**2**	**3**	**4**	**5**
13	What I do can determine whether my diabetes gets better or worse	**1**	**2**	**3**	**4**	**5**
18	My diabetes will improve in time	**1**	**2**	**3**	**4**	**5**
15	Nothing I do will affect my diabetes	**1**	**2**	**3**	**4**	**5**
8	My diabetes does not have much effect on my life	**1**	**2**	**3**	**4**	**5**
17	My actions will have no effect on the outcome of my diabetes	**1**	**2**	**3**	**4**	**5**
14	The course of my diabetes depends on me	**1**	**2**	**3**	**4**	**5**

19	There is very little that can be done to improve my diabetes	**1**	**2**	**3**	**4**	**5**
12	There is a lot which I can do to control my diabetes	**1**	**2**	**3**	**4**	**5**
21	The negative effects of my diabetes can be prevented (avoided) by my treatment	**1**	**2**	**3**	**4**	**5**
37	Having this diabetes makes me feel anxious	**1**	**2**	**3**	**4**	**5**
35	My diabetes makes me feel angry	**1**	**2**	**3**	**4**	**5**
24	The symptoms of my diabetes are puzzling to me	**1**	**2**	**3**	**4**	**5**
25	My diabetes is a mystery to me	**1**	**2**	**3**	**4**	**5**
32	I go through cycles in which my diabetes gets better and worse.	**1**	**2**	**3**	**4**	**5**
27	My diabetes doesn't make any sense to me	**1**	**2**	**3**	**4**	**5**
28	I have a clear picture or understanding of my diabetes	**1**	**2**	**3**	**4**	**5**
29	The symptoms of my diabetes change a great deal from day to day	**1**	**2**	**3**	**4**	**5**
30	My diabetes come and go in cycles	**1**	**2**	**3**	**4**	**5**
31	My diabetes is very unpredictable	**1**	**2**	**3**	**4**	**5**
26	I don't understand my diabetes	**1**	**2**	**3**	**4**	**5**
7	My diabetes has major consequences on my life	**1**	**2**	**3**	**4**	**5**
34	When I think about my diabetes I get upset	**1**	**2**	**3**	**4**	**5**
23	There is nothing which can help my condition	**1**	**2**	**3**	**4**	**5**
36	My diabetes does not worry me	**1**	**2**	**3**	**4**	**5**
22	My treatment can control my diabetes	**1**	**2**	**3**	**4**	**5**
38	My diabetes makes me feel afraid	**1**	**2**	**3**	**4**	**5**

SECTION C: MARS 5

Please indicate how much you agree or disagree with the following statements about your diabetes medication by writing the number in the appropriate box that correspond with the option that best describes you.

Items	Always 1	Often 2	Sometimes 3	Rarely 4	Never 5
I forget to take my medication	1	2	3	4	5
I alter my medication	1	2	3	4	5
I stop taking my medication after a while	1	2	3	4	5
I decided to skip one of my medication dosages	1	2	3	4	5
I use my medication less than is prescribed	1	2	3	4	5

SECTION D: AFRICULTURAL COPING INVENTORY

Below are a set of ways people use to adapt when confronted with an illness. Please read each statement carefully and tick appropriately as it applies to how you use each method in dealing with your illness.

Does not apply = 0 Used a little = 1 Used a lot = 2 Used a great deal = 3

STATEMENT	**Does not apply** **0**	**Used a little** **1**	**Used a lot** **2**	**Used a great deal** **3**
1 .Prayed that things would work themselves out	**0**	**1**	**2**	**3**
2. Went to church (or other religious meeting) to get help from the group	**0**	**1**	**2**	**3**
3. Read a scripture from the Bible (or similar book) for comfort and/or guidance	**0**	**1**	**2**	**3**
4. Asked someone to pray for me	**0**	**1**	**2**	**3**

5. Read passage from a daily meditation book	**0**	**1**	**2**	**3**
6. Asked for blessings from a spiritual or religious person	**0**	**1**	**2**	**3**
7. Sung a song to myself to help reduce the stress	**0**	**1**	**2**	**3**
8.Left matters in God's hands	**0**	**1**	**2**	**3**

SECTION D: DASS 21

Please read the questions below carefully indicate the presence of a symptom over the previous week. Each item is scored from 0 (did not apply to me at all over the last week) to 3 (applied to me very much or most of the time over the past week).

The rating scale is as follows:

0 Did not apply to me at all - NEVER

1 Applied to me to some degree, or some of the time - SOMETIMES

2 Applied to me to a considerable degree, or a good part of time - OFTEN

3 Applied to me very much, or most of the time - ALMOST ALWAYS

	Never **0**	**Sometimes** **1**	**Often** **2**	**Almost always** **3**
1.I found it hard to calm down	**0**	**1**	**2**	**3**
2. I was aware of dryness of my mouth	**0**	**1**	**2**	**3**
3. I couldn't seem to experience any positive feeling at all	**0**	**1**	**2**	**3**
4. I experienced breathing difficulty (e.g., excessively rapid breathing, difficulty breathing in the absence of physical exertion)	**0**	**1**	**2**	**3**
5. I found it difficult to work up the initiative to do things	**0**	**1**	**2**	**3**
6. I tended to over-react to situations	**0**	**1**	**2**	**3**

7. I experienced shakiness (e.g., in the hands)	**0**	**1**	**2**	**3**
8. I felt that I was using a lot of nervous energy	**0**	**1**	**2**	**3**
9. I was worried about situations in which I might feel afraid and make a fool of myself	**0**	**1**	**2**	**3**
10. I felt that I had nothing to look forward to	**0**	**1**	**2**	**3**
11. I found myself getting nervous	**0**	**1**	**2**	**3**
12. I found it difficult to relax	**0**	**1**	**2**	**3**
13. I felt down-hearted and sad	**0**	**1**	**2**	**3**
14. I was intolerant of anything that kept me from getting on with what I was doing	**0**	**1**	**2**	**3**
15. I felt I was close to panic	**0**	**1**	**2**	**3**
16. I was unable to become enthusiastic about anything	**0**	**1**	**2**	**3**
17. I felt I wasn't worth much as a person	**0**	**1**	**2**	**3**
18. I felt that I was rather impatient	**0**	**1**	**2**	**3**
19. I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	**0**	**1**	**2**	**3**
20. I felt scared without any good reason	**0**	**1**	**2**	**3**
21. I felt that life was meaningless	**0**	**1**	**2**	**3**

THANK YOU!!!

APPENDIX II

Respondents Consent Form

UNIVERSITY OF GHANA

OFFICE OF RESEARCH, INNOVATION AND DEVELOPMENT

Ethics Committee for Humanities (ECH)

PROTOCOL CONSENT FORM

Section A- BACKGROUND INFORMATION

Title of Study: Living With Diabetes: A Study Of Illness Representation, Spiritual Coping, Psychological Distress And Medication Adherence.

Principal Investigator: Owiredua Christiana

Section B– CONSENT TO PARTICIPATE IN RESEARCH

General Information about Research

The purpose of the current study is to investigate how diabetic patients own beliefs and expectation of diabetes, distress as well as the use of spiritual coping relates with their diabetes adherence. The study is expected to last for about 30-45 minutes at the start of the study. Participants who agree to take part in the research are requires to sign or thumbprint this after a general information of the research has been given to you and you agree to partake it.

Participants will be given a questionnaire and how to respond to the questions on each of the sections will be explained to participants.

Benefits/Risk of the study

The benefit of participating in this research will be that, during and after assessment of mental health, participants identified to be requiring care will receive further assessment and therapy. There is by far no known identified risk to occur in participating in this research.

Confidentiality

No identifiable information such as names or telephone numbers shall be attached with the information gathered. Also data that is gathered will be kept privately. Data gathered will not use for any other purpose except that which is stated here. The groups that will have access to the data being gathered will be the principal investigator, two research assistants who are trained in ethics related to human research, and research supervisors.

Compensation

There will be no compensation packages for participating in the study, however your participation will be greatly appreciated

Withdrawal from Study

Participation in this study is solely on voluntary basis and Participants who volunteer to take part in the study at any point of the study can withdraw without any form penalty and adverse effect.

Contact for Additional Information

In case of any enquiries, questions and/or answers about this research or in situations of research related injuries please contact the researcher on:

Owiredua Christiana, University of Ghana, Department of Psychology, Post Office Box Lg 84, Legon, +233200245792, owireduac@gmail.com

Section C- VOLUNTEER AGREEMENT

"I have read or have had someone read all of the above, asked questions, received answers regarding participation in this study, and am willing to give consent for me, my child/ward to participate in this study. I will not have waived any of my rights by signing this consent form. Upon signing this consent form, I will receive a copy for my personal records."

_____

Name of Volunteer

_____ _____

Signature or mark of volunteer Date

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.

_____

Name of witness

_____ _____

Signature of witness Date

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.

_____

Name of Person who Obtained Consent

_____ _____

Signature of Person Who Obtained Consent Date

APPENDIX III

Ethical Clearance Letter

UNIVERSITY OF GHANA
ETHICS COMMITTEE FOR THE HUMANITIES (ECH)
P. O. Box LG 74, Legon, Accra, Ghana

My Ref. No.....

27th March, 2015

Ms. Christiana Owiredua
Department of Psychology
University of Ghana
Legon

Dear Ms. Owiredua,

ECH 067/14-15: LIVING WITH DIABETES: A STUDY OF ILLNESS REPRESENTATION, SPIRITUAL COPING, MENTAL HEALTH AND MEDICATION ADHERENCE

This is to advise you that the above reference study has been presented to the Ethics Committee for the Humanities for a full board review and the following actions taken subject to the conditions and explanation provided below:

Expiry Date:	17/03/16
On Agenda for:	Initial Submission
Date of Submission:	20/02/15
ECH Action:	Approved
Reporting:	Quarterly

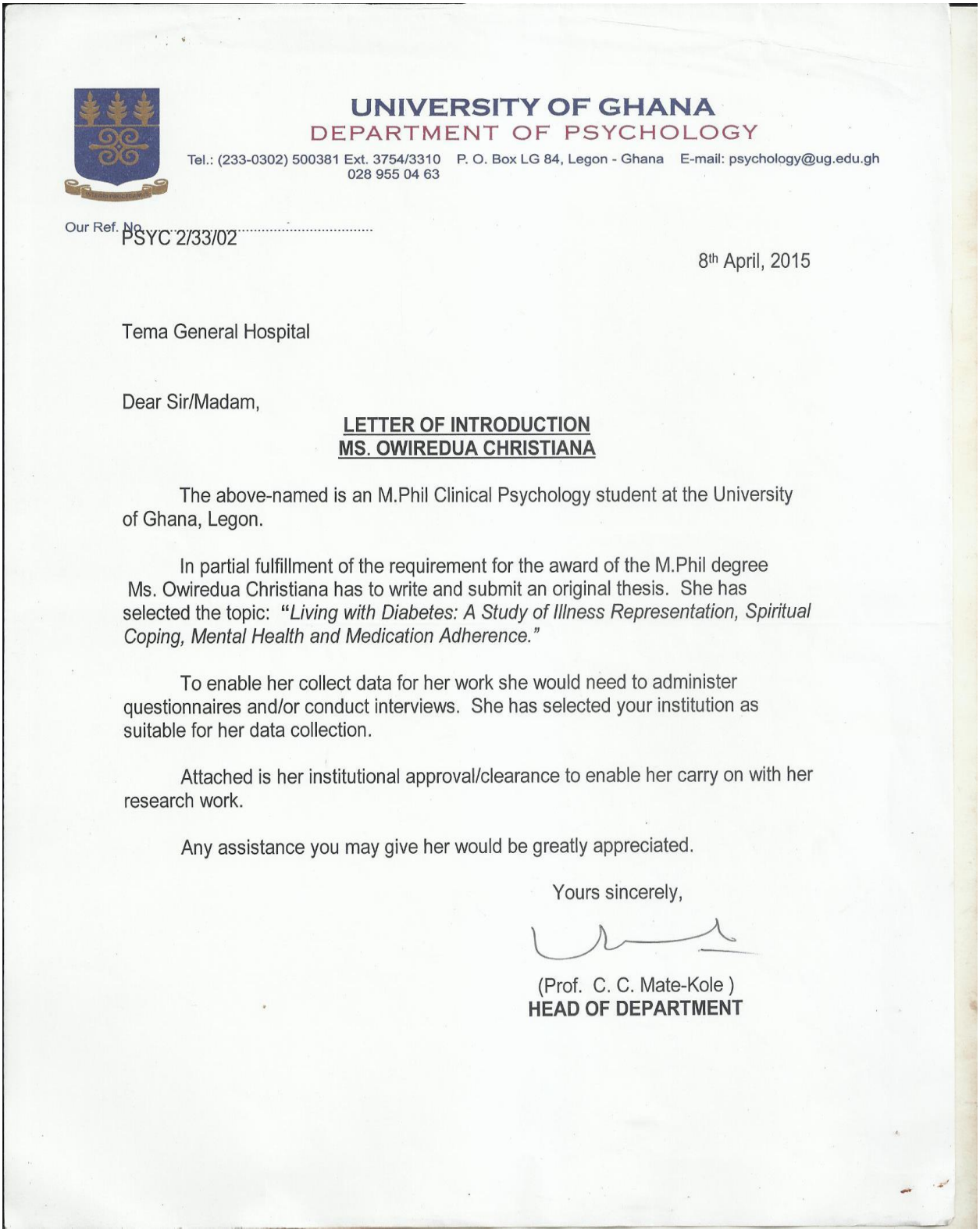
UG/IISSER/ECH VALID UNTIL 17 SEP 2015 APPROVED DOCUMENT

Please accept my congratulations.

Yours Sincerely,

Rev. Prof. J. O. Y. Mante
ECH Chair

APPENDIX IV



UNIVERSITY OF GHANA
DEPARTMENT OF PSYCHOLOGY

Tel.: (233-0302) 500381 Ext. 3754/3310 P. O. Box LG 84, Legon - Ghana E-mail: psychology@ug.edu.gh
028 955 04 63

Our Ref. No. PSYC 2/33/02

8th April, 2015

Tema General Hospital

Dear Sir/Madam,

LETTER OF INTRODUCTION
MS. OWIREDUA CHRISTIANA

The above-named is an M.Phil Clinical Psychology student at the University of Ghana, Legon.

In partial fulfillment of the requirement for the award of the M.Phil degree Ms. Owiredua Christiana has to write and submit an original thesis. She has selected the topic: "*Living with Diabetes: A Study of Illness Representation, Spiritual Coping, Mental Health and Medication Adherence.*"

To enable her collect data for her work she would need to administer questionnaires and/or conduct interviews. She has selected your institution as suitable for her data collection.

Attached is her institutional approval/clearance to enable her carry on with her research work.

Any assistance you may give her would be greatly appreciated.

Yours sincerely,

(Prof. C. C. Mate-Kole)
HEAD OF DEPARTMENT