ETHNIC AND GENDER DIFFERENCES IN THE RELATIONSHIP BETWEEN PSYCHOLOGICAL, SOCIO-COGNITIVE AND SOCIO-DEMOGRAPHIC VARIABLES IN PEOPLE WITH DIABETES MELLITUS IN NIGERIA

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except where indicated by specific reference in the text. No part of the thesis has been submitted as part of any other academic award. This thesis has not been presented to any other education institution in the United Kingdom or overseas.

Any views expresses in the thesis are those of the author and in no way represent those of the University of Gloucestershire.

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ABSTRACT

Background: Diabetes is a growing public health problem affecting people worldwide both in the developed and developing countries, and poses a major socio-economic, psychological and Behavioral challenge. Consequently, diabetes takes a staggering toll on the people in Nigeria and the economic burden is very high. It is a well known fact that numerous factors influence diabetes self-care: such as patient's physical, psychological, social, cognitive and health care system factors. In this study, the researcher set out to elicit an understanding of the association between socio-demographic, socio-cognitive, and psychological health and to specifically provide explanations for how these three factors are related and differ across ethnicity, gender and type of diabetes. Conversely, studies investigating the psychological health in people with diabetes have observed disparities in terms of gender, ethnicity and the type of diabetes. More so, the impact of socio-cognitive health indicators on psychological status in the Nigerian context remains invisible and unknown. Additional investigations were carried out to assess the pattern of the psychological health of diabetic patients using socio-demographic and socio-cognitive factors, to identify if differences occur in the psychological and socio-cognitive factors by gender, ethnicity and type of diabetes. Finally, an exploration of the contextual and explanatory factors perceived to have underlain the gender ethnicity and type of diabetes differences observed in the psychological status and socio- cognitive health was carried out.

Methods: A sequential explanatory mixed methods design comprising a quantitative phase followed by a qualitative phase was employed. In the quantitative phase general survey, data from the N= 486 participants were analysed to test for significant differences of ethnic groups, gender, type of diabetes and the relationship they all have on psychological status and socio-cognitive health. The qualitative phase on the other hand, was based on a follow up of the significant results by using semi-structured focus group interviews with 18 recruited respondents across gender, ethnic groups and type of diabetes.

Findings: A 2x4x2 MANOVA hypotheses: 2 and 3 from the quantitative study showed a significant interaction between gender, ethnicity and type of diabetes; ethnicity and type of diabetes; gender and type of diabetes; gender and ethnicity. From the partial eta squared η^2 , type of diabetes explains more of the variance remaining (after excluding the variance attributable to other variables) (21.4% vs 20.1%); than gender (21.1% vs 13.3%); which, in turn, explains more of the variance than ethnicity (5.6% vs 6.5%) on the combined DVs Psychological and Socio-cognitive health respectively. The qualitative results revealed extreme and overwhelmingchallenges diabetes imposed on the sufferers. It provided specific insight and on patients contextual experiences such as non-adherence; concerns about the present and the future' health care systems and the way medical practitioners interact with patients which negatively impact on psychological status. These factors broadened the quantitative result in terms of the consistence in the patients' descriptions of living with and self-managing their diabetes.

Conclusions: The outcome of the t study has extended knowledge on the complex and dynamic nature of individuals' responses to the challenges of diabetes in day-to-day self-care management and how best diabetic patients should be supported in order to promote adherence, positive treatment processes, provide assistance to the physical discomfort associated with diabetes, and support pro-diabetes coping behaviors (diet), through psychotherapy so as to enhance optimal psycho-behavioral health.

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‘Patience is bitter, but its fruit is sweet’ **(Jean-Jacques Rousseau)**

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LIST OF ABBREVIATIONS

NECNDN	National Expert committee on non-communicable Diseases in Nigeria
IDF	International Diabetes Federation
WHO	World Health Organization
NCCD	Non –communicable chronic diseases
NCD	Non –communicable diseases
UBTH	University of Benin Teaching Hospital
MDD	Major Depression Disorder
DM	Diabetes Mellitus
TRD	Triadic Reciprocal Determinism
SCT	Social Cognitive Theory
HRQOL	Health Related Quality of life
HBM	Health Belief Model
SRM	Self- Regulatory Model
SCM	Social cognitive model
SEP	socioeconomic position
M-BD1	Modified Beck Depression (One)
GAD-7	Generalized Anxiety Disorder (Seven)
FAS	Fatigue Assessment Scale
SWLS	Satisfaction with Life Scale
SOC	Sense of Coherence
MHLOC	Multidimensional Health Locus of Control
RSES	Rosenberg Self Esteem Scale
GSES	General Self-efficacy Scale
LOT-R	Life Orientation Test-Revised
DUREL	Duke Religiosity
NRCOPE	Negative Religious Cope
MOSSSS	Medical Outcome Study Social support Survey

DSM-5	Diagnostic Statistical Manual
GAS	General Adaptation Syndrome
ADA	American Diabetes Association
NANDA	North American Nursing Diagnosis Association
FSS	Fatigue Severity Scale
WHOQOL	World Health Organization Quality of Life
IHLOC	Internal health locus of control
NIDDM	Non-insulin Dependent Diabetes Mellitus
IDDM	Insulin Dependent Diabetes Mellitus
VAS	Visual Analogue Scale
PSS	perceived stress scale
ISI	Insomnia Severity Index
FRDC	Faculty Research Degrees Committee
UOG	University of Gloucestershire
ICN	International council of Nurses
CDCP	Centres for Disease Control and Preventions
DCCT	Diabetes Control and Complications Trial

CHAPTER ONE

BACKGROUND AND JUSTIFICATION TO THE STUDY

1.0 Introduction: Incidence of Diabetes Worldwide

According to the World Health Organization (WHO 2008), diabetes mellitus is defined as a chronic disease primarily characterized by a high level of blood glucose (hyperglycaemia), giving rise to the risk of tiny blood vessels being damaged (retinopathy, neuropathy and nephropathy). Conversely, the World Health Organization recognises four distinct types of diabetes mellitus: Type 1, Type 2, Gestational diabetes and other types. Type 1, once known as juvenile diabetes or insulin-dependent diabetes, is a condition in which the pancreas produces little or no insulin, a hormone needed to allow sugar (glucose) to enter cells to produce energy. Type 2 diabetes, is induced by inappropriate dietary lifestyle and is far more common, occurs when the body becomes resistant to the effects of insulin or doesn't make enough insulin (Mayo Clinic 2010). Gestational diabetes results from impaired glucose regulation that occurs during pregnancy. While the other forms of diabetes mellitus occur due to genetic defects, some to problems in insulin secretion following infection drugs or exposure to toxins.

In addition, diabetes is known as one of the most widespread and incurable endocrine diseases, meaning that although it can be controlled, it lasts a lifetime. At present, there is no cure for diabetes and it is a growing public health problem affecting people worldwide both in the developed and developing countries, and poses a major socio-economic, psychological and Behavioral challenge (Dahiru et al., 2008; Mbanya et al., 2010). In 2011, 366 million people worldwide were affected by diabetes and it is estimated that in 2030, 552 million people will have diabetes (IDF, 2011). Because of the growing prevalence of diabetes, it becomes very important to understand all aspects of diabetes. Consequently, diabetes is the sixth leading cause of death worldwide (MMWR 2002), and 1 in 20 adult deaths in the developing countries is diabetes related (Gojka et al., 2005). Moreover, the overall risk of premature death is twice as high among individuals with diabetes as for those without diabetes (WHO, 2008). Globally, diabetes was the cause of death in 4.6 million people in 2011. This is greater than the global mortality for hypertension, AIDS, and tuberculosis. (WHO, 2010; Hu, 2011; UNAIDS, 2010). Furthermore, the number of diabetes case worldwide has increased significantly in the last decade (Zeck, & Mclntyre, 2008), and it is associated with reduced life expectancy, that is 1% of patients with type 1 are known to die within one year of diagnosis and about 33% are dead 30 years after diagnosis in the developed countries. Similarly, in the developing countries, type 1 patients die younger andthe average life expectancy is between 20-30 years (Darman et al., 1984). Patients diagnosed with type 2 diabetes in middle age (40-49 years) stand to lose as much as 10 years of life expectancy (Panzram 1987), and with significant morbidity and diminished quality of life (WHO, 2008).

Diabetes, affects both poor and rich nations and all age groups (Murray & Lopez, 1997; Gupta, et al., 2011), but the health burdens created by this epidemic are especially affecting more of the developing countries, whose meagre economy is under the crushing weight of the global economic crunch (Sen, 1999; Marmot, 2006; Ewhrudjakpor, 2009). For example, there is overwhelming evidence of high prevalence and burden of diabetes which is rising quickly in sub-Saharan Africa (Mbanya et al., 2010; Tuei et al., 2010). Although diabetes was previously thought to be rare or not documented in rural Africa, over the past few decades, it has emerged there as an important non-communicable disease (McLarty, Pollit, & Swai, 1990; Motala et al., 2008; Levitt, 2008). This is a shift from what Albert Cook, a medical missionary in Uganda, observed in 1901 when he noted that "…diabetes is rather uncommon and very fatal…" (Cook, 1901). The disease has been changing significantly over the past thirty to forty years as the number of people with diabetes is increasing due to population growth, ageing, urbanization, and increasing prevalence of obesity and physical inactivity, making diabetes currently regarded as a major public health problem throughout Africa (IDF, 2003). Similarly, in 2000, the prevalence of diabetes in WHO African Region was estimated at 7.02 million people, out of which about 0.702 million (10%) had type 1 diabetes and 6.318 million (90%) had type 2 diabetes. However, the number of diabetes cases for sub-Saharan Africa increased about 98% in 2009 to 12.1 million in 2010 and is projected to increase to about 23.9 million in 2030 (IDF 2009).

Additionally, in sub-Saharan Africa, the effect of ageing on the population of type 2 diabetes is already evident with most reports indicating a peak at either 65 years or older (Fisch et al., 1982; Ducorps et al., 1996; Ahren and Corrigan 1984), or from

55-64 years (Motala et al., 2008; Christensen et al., 2009). Similarly, type1 age onset is later in African communities (age 22-29 years) than in population from Europe (Swai et al., 1981; Omer and Asmal 1984). However, as the diabetes epidemic matures, the age at onset will shift to younger age-groups and early-onset type 2 diabetes will emerge (Glaser, 1999), because of the western lifestyle such as over dependence on fast food and the issue of less engagement in physical activities among young people.

1.1 Why the Current Study is Important?

Recently, Dr. Margaret Chan, Director General of the World Health Organization, while addressing the first Global Forum of Non-communicable Disease Network in Geneva, stated that the NCDs “have changed places” (WHO, 2003). She went on to argue that these diseases, such as diabetes, which were once associated with abundance are now heavily concentrated in poor and disadvantaged groups. She further states that this shift in the diseases burden could be attributed to some powerful global forces that are shaping health conditions everywhere. However, the consequences are heavily felt in the developing countries, especially in the sub-Saharan region e.g. Nigeria, where there is greater vulnerability and least resilience and most of the people are poor with little or no formal education and understanding of the nature of the disease (Adetuyibi, 1976; Famuyiwa et al., 1985).

It is clear that the value of good health is priceless and it is essential to an individual’s well-being and ability to participate fully in the workforce and in a democratic society (Braveman, Kumanyika, Fielding, Laveist, Borelli, Manderscheid & Troutman, 2011). Surely, this growing problem of diabetes will have a significant impact on national and individual economies as well as individual health, which is dependent on the entire populations’ health (Lerner, Allaire & Reisine, 2005; Laveist, Gaskin & Richard, 2009). More so, understanding the health condition of an individual is of importance in the field of health psychology in planning for adequate and timely intervention and health promotion.

This knowledge is of importance since ill health denotes a potential source of suffering, disability and/ or loss of life, and an obstacle to fully expressing one’s views and engaging in political process (Sen, 1999; Braveman et al., 2011).

Similarly, the World Health Organization defined health as a “State of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 1946). Consequently, these three dimensions of health relate in both clockwise and anticlockwise direction. This analogy supports the view of Kendall (1997), that unbalancing of one aspect of health will result in a disruption to the overall health status.

Equally, according to Brannon et al., (2013), the field of health psychology views health as a continuum which is indivisible, to the extent that ill health is interrelated in the understanding of what makes some people with diabetes more able to cope with distressing situation of their condition, what factors contribute to the development of depression in diabetes patients, and how to possibly predict whether a person newly diagnosed with diabetes will manage the demands of the condition. These views have been expanded to include subjective and objective dimensions of health, together with environmental components, as well as individual and cultural elements, that affect the populations’ health (Frankish et al., 1996). These set of factors that affect health and wellbeing are conceptualised as determinants of health (Dahlgren &Whitehead, 1991; Krieger, Williams & Moss, 1997).

This explains the link between socio-cognitive health and psychological health indicators. The term socio-cognitive is a collective and different social process involved in the acquisition, storage, transmission, manipulation and use of information for the purpose of solving problems. In this context, the word ‘social’ is used to denote how cognition is accomplished, not it’s content. It is evident that at least some social cognition occurs in every kind of problem-solving situation, though the amount and type depends on the specific problem-solving functions that need to be addressed in order to reach a problem solution. The present study examined a number of these factors, such as self-efficacy, locus of control, and senses of coherence in determining their impact on the variables of psychological health indicators e.g. depression which despite the wellness of every day psychological functioning in people diabetes (Stockdale, Dawson- Owens, Sagrestano, 2005; Erdogan, I. & Erdogan, 2009). Considering the socio-cognitive impact of ill health, there is an urgent need to address this topic. Despite the current advances in medical science and epidemiology, the World Health Organization in their publication, Health Crisis, 2000 (O’ Neil, 1983) cited by (Kendall, 1997) estimated that only

(20%) of disease common in the western countries but now spreading everywhere-such as diabetes can be cured. Consequently, the rest of the ill population (80%) constitute a health burden to public worldwide.

However, while the advances in medical sciences, together with the understanding and application of vaccinations, has helped to bring communicable disease under control especially in developed countries, it has done little to help the epidemic of non-communicable diseases such as diabetes (Murray & Lopez, 1997; Marmot, 2006). These views supported the report published by the World Health Organisation, (2005) that the major burden of disease worldwide is caused by non-communicable diseases (e.g., depression, stress, and diabetes). According to Murray and Lopez (1997), non-communicable diseases contribute about (40.9%) of the global burden of disease (GBD).

Subsequently, the prevalence of depression in the general population ranked fourth in the league of thirty leading causes of worldwide disability adjusted life year (DALYS), for both sexes in 1990 (Murray & Lopez, 1997). More so, the recent prediction by the World Health Organization, that depression will become the second greatest contributor to global illness by 2020, and will as well be a significant cause of morbidity and mortality (Murray & Lopez, 1997) requires action through health promotion and intervention. The link between depression and diabetes is of concern in this regard as Gavard et al (1993) reviewed 20 studies of the comorbidity of depression and diabetes and found that the prevalence of current depression in the diabetic samples averaged around 15%, much higher than in the general population. Again, this impending health crisis requires more research to understand the risk factor(s) of depression in diabetic population, and make the findings and recommendations available for use in evidence based health care practice.

Furthermore, as reported above, on the prevalence of depression, it has been found that poor people within the general population are less well adjusted (e.g., Marmot, 2006). Similarly, there is enough evidence from both health scientists and economists (e.g. Warr, 1981; Sen, 1999; Marmot, 2006), that the high prevalence of depression in diabetes patients may be interpreted in the context of the individual socio-cognitive factors, together with the hard economic conditions related to the global credit crunch, which is making life vulnerable, insecure and unbearable for many people.

Unfortunately, the economic implications relating to the high prevalence of non-communicable diseases are enormous. For instance, the costs associated with diabetes are difficult to accurately capture but some estimates suggest that USD 232 billion were spent worldwide in 2007 to treat and prevent diabetes and this number is expected to climb to a minimum of over USD 300 Billion in 2025 (IDF, 2008). Conversely, the indirect costs of diabetes such as lost productivity are at least as high and increased as more economically productive people are affected. Similarly the mental health budget in England alone in 2002/2003 was reported to be as high as £77.4 billion (Donaldson & Scally, 2009), and combined with the growing comorbidity between diabetes and mental health (e.g., depression, anxiety) this amount to a double burden and high cost for both the individual and that of the nation. There is therefore an urgent need for studies like this to provide more information on how to plan for health intervention and health promotion related to diabetes .

However, to plan for appropriate health education and health promotion intervention regarding diabetes, both on the national and international level, there is a need for cross-cultural studies that will provide epidemiological data on the associated risk factors and prevalence of associated psychological health issues. Unfortunately, literature review these issues reveal a shortage of data on a global scale. Owing to this, the epidemiologist; Marmot, (2006), opined that the limiting factors in the study of health issues such as diabetes is the fact that few countries have available data that can be studied and compared with other nations and which can be consulted while planning for health intervention. He argued further that to overcome these obstacles and make data available for appropriate health intervention, that more research should be encouraged as a guide for further action (Marmot, 2006). Similarly, a comprehensive approach to identifying all the factors related to diabetes guarantees greater success in diabetes management and the effectiveness of such an approach is dependent on the clear comprehension of complex interrelations between variables of different types and their predictive relations to enhance adequate intervention method (Wasserman, et al., 2002).

As such, this current study is aimed at addressing these identified problems based on two fundamental assumptions: first, it assumed that human disease does not occur at random but that it is a product of environmental and individual actions. In other words, human health is a social matter not just an individual one (Moller, 1998). Secondly, human diseases have causal and preventive factors that can be isolated by researching on the individuals within a population in different places or at different times (Moller, 1998). However, if more knowledge of psychological health determinants is established, then the required and appropriate intervention can be applied. Thus the general aim of the current investigation is to measure the prevalence, differences and correlates of psychological, socio-cognitive and socio-demographic health factors among clinically diagnosed diabetic patients in Nigeria. While the specific aims are to:

i. Assess the significant differences in the pattern of socio-demographic and socio-cognitive factors on *psychological health* of diabetic patients in Nigeria.
ii. Identify any significant differences by gender, ethnicity and type of diabetes on *psychological status* among diabetic patients in Nigeria.
iii. Identify any significant differences by gender, ethnicity and type of diabetes on the *socio-cognitive factors* among diabetic patients in Nigeria.
iv. Explore the contextual factors perceived to underlie the differences in gender, ethnicity and type of diabetes observed in psychological status and socio-cognitive health among diabetic patients in Nigeria.

1.2 Why the Current Study may be Needed Internationally?

There is a scarcity of studies across cultures, populations and different age groups that have examined co-currently the psychological health, socio-cognitive factors and socio-demographics health factors of diabetes mellitus population (Yi et al., 2008; Everson et al., 2002). More importantly, most researchers, while recognizing the scarcity of studies in this area, also noted the methodological limitations of the available studies, which render the findings of such studies invalid in evidence based interventions (Issa et al., 2007; Akinlade et al., 1996; Mosaku et al., 2008). To improve upon the limitations of the previous studies is a key aim of the current study. Some of those shortcomings associated with the previous studies of diabetic population include:

(1)The use of small sample size and convenience sampling technique: researchers argued that studies of diabetes with small or moderate sample size lacked statistical power and do not support correlation analysis (Callaghan, 1998; Steptoe & Wardle, 2001: Dowdwall & Weichsler, 2002). On the other hand, (Cohen 1983) maintained that a scientifically valid sample of sufficient size is important to detect small to medium – sized effects as well as enabling for wider range of statistical analysis (Cohen, 1983). Similarly, researchers (e.g. Steptoe & Wardle, 2001) argued that studies that employed a convenience sample would produce results that are not representative. The current study improves upon these limitations by employing a probability sampling technique, that is, a stratified random sample that cuts across several sampling sites, and is based on a large sample size of (N=486).

(2) Studies conducted on a single variable: most studies of diabetes that examined psychological health and socio-cognitive health (Adejoh 2012; Agbir, et al., 2010) examined only a single psychological health indicator (e.g. depression) and a single socio-cognitive health indicator (e.g., self-efficacy). However, Whitefield (2001) argued that socio-cognitive and psychological health denotes a broad range of variables that are organized into a coherent way and therefore required that multiple types of socio-cognitive and psychological health factors be employed when studying the health conditions of a population. Similarly, Whitefield further argued that using a single socio-cognitive health indicator (e.g. optimism) can only report a pattern expression of individual perception that might contribute partly to socio-cognitive health but it would not by itself alone be described as a socio-cognitive health.

In other words, numerous psychological health indicators for diabetic patients (e.g., depression, anxiety and stress) and various socio-cognitive health (e.g. sense of coherence, locus of control, self-esteem and self-efficacy) need to be studied and statistically analysed concurrently for a possible correlation, prevalence and predictions (Wasserman, et al., 2002; Mikolajczyk et al., 2008). This study advances by examining numerous psychological health and socio- demographic variables (e.g. socioeconomic status, gender, marital status, and religion) together with socio-cognitive health factors (e.g., sense of coherence, self-efficacy locus of control). Till date, very few studies similar in diversity with wide range of variables, and with large and representative sample of diabetes population exist in reported literature in Nigeria.

(3) The use of single and invalidated items: researchers such as Field, (2005) argued that single item scales (i.e. one-question scales) are associated with poor psychometric properties. Conversely, most studies on diabetic patients especially those conducted in developing countries used a single inventory that have not being validated internationally e.g. Connell et al., (1994) measured self-efficacy with a single item which did not adequately capture the phenomenon. Similarly, Agbir et al., (2010), in retrospective studies among diabetes patients in Nigeria employed the structural clinical interview for (DSM-IV) Axis 1 item. More so, results from such study make international comparisons impossible. However, if studies from one country are to be compared with those of other countries, researchers (e.g., Steptoe & Wardle, 2001; Marmot, 2006) argued that science must speak with one voice, that is, researchers must use validated items to enable for international comparisons of studies. This is the advantage the current study possesses. It employed measures (e.g., Beck depression inventory, Cohen's perceived stress scale, World Health Organization Quality of Life), that can be validated internationally.

(4) Controversy on previous research findings: in order to plan for appropriate interventions, research findings must be true to what is documented in terms of its originality and straight forwardness. However, this is not always the case with many studies of diabetic patients being controversial or contested. There is a need for replication of studies in other settings using identical items and participants. Contradictory reports in the literature, call for further investigations, with similar samples and methodology. For instance the study of Fisher et al., 2008; Bener et al., 2011; Kaur et al 2013) showed an association between female gender and psychological health indicator e.g. depression, anxiety and stress among diabetic sample. In contrast, other studies (e.g. Garousi & Garrusi, 2013) found no relationship between gender and depression or anxiety. Consequently, Whitefield, (1999) argued that investigating few isolated variables will likely obscure co-founding relationship. Similarly, researchers e.g. Garrosi & Garrusi (2013), noting the limitations in their studies of diabetes recommended that further research is needed in other countries, and should employ numerous variables so as to understand the association between variables such as gender and other psychological health risk factors in people with diabetes.

In a similar study, researchers (Kane et al., 2011; Buchi et al., 1998; Cohen & Kanter 2004) reported that low sense of coherence score was associated with high level of depression and anxiety. However, Sense of Coherence (SOC) is rather unexplored among patients with diabetes mellitus in Nigeria and the available data within the globe are inconsistent on the relation between SOC and psychological health. This was evident in the studies of Lundman & Norberg (1993) and Richardson et al., (2001) with findings that SOC was not related with psychological health indicators among insulin-dependent diabetes.

Similarly, self-efficacy was reported in some studies (e.g. Kanbara et al 2008) to be positively associated with reduced stress response and reduction in both depressive and anxiety symptoms in diabetic patients. In contrast, other researchers (e.g. Connell et al 1994), reported that self-efficacy was not related to lower depressive symptoms. It is clear that there is no clear consensus on factors related to psychological health in diabetic patients and there is need to clarify the role of multiple factors in this regard.

On the contrary, socio-economic determinants, such as income status, living conditions and educational attainments have been strongly implicated in depression among people with diabetes (Lewko et al., 2012; Garousi & Garrusi 2013). However, less research has been done on the link between diabetic patients' psychological health and socio-cognitive health. This topic is important, because more knowledge can lead to better illness understanding, and more accurate intervention that will improve patients' psychological health.

1.3 Why the Study is Focused on Type 1 and Type 2 Diabetes?

Another issue of importance in any investigation of diabetes is the type of diabetes. As mentioned above, type 1 and type 2 diabetes in WHO African Region ranges between 0.702 million (10%) for type 1 and 6.318 million (90%) for type 2. In addition, the disease process differs between type 1 and type 2 diabetes, it may be expected that psychological processes would also vary in the two populations (Barnard, Skinner, & Peveler, 2006). Age of onset and duration of illness are generally quite different between type 1 and type 2 diabetes patients. While both sets of patients are likely to experience complications, persons with type 1 diabetes are more likely to experience acute symptoms of diabetes (e.g. ketoacidosis) while the onset of more general complications (e.g. neuropathy) are likely to occur sooner following diagnosis in type 2 patients. Additionally, the treatment and self-care regimen may be different for type 1 and type 2 diabetes (e.g. administration of exogenous insulin), creating different psychological burdens for each patient (Barnard et al., 2006).

Nevertheless, evidence for disparities in prevalence rates of psychological factors such as depression between type 1 and type 2 diabetes is somewhat inconclusive. For example, the Anderson (2001) meta-analysis found that the overall risk of depression among patients with diabetes is almost two times that of the general population, noting that odds ratios did not differ significantly between type 1 and type 2 diabetes. Similarly, Collins, Corcorant and Perry (2008) reported that type of diabetes was not significantly associated with higher depression scores. In contrast, the studies of Sacco and Bykowski (2010), reported that depression was significantly correlated with self-efficacy among type 1, but not among type 2 diabetic patients, so more studies are needed to explore on these discrepancies in terms of the two types of diabetes. However, the available studies on the psychological health indicators among diabetic population in Nigeria are limited in distinguishing types of diabetes (e.g. Agbir et al. 2010; James et al. 2010). This information is clearly warranted in the Nigeria context.

1.4 Why the Current Study is Important for Nigeria?

There are numerous reasons for carrying out this study in Nigeria. First and foremost; at the beginning of the last century, diabetes studies in Nigeria reported a low prevalence rate <1% of diabetes among the general population in Nigeria (e.g. Kinnear, 1963; Johnson 1969), but presently, there is an increasing incidence of diabetes among Nigerian population (Kengne et al., 2005). Although there have been few studies on the prevalence of diabetes in the Nigerian population (Olatunbosuni 1998), recent studies (e.g. Akinkugbe 1997; Adeleye et al 2006. Nwankwo et al., (2010) have reported a progressive increase in the prevalence of diabetes in Nigeria with poor healthcare services and accessibility. Similarly, the report from the

National Expert committee on non-communicable Diseases in Nigeria, estimated the increasing incidence of diabetes to be between 0.6- 7.2 % (NECNDN, 1997).

Nigeria is ranked 23 among the 25 countries in the world with highest number of diabetes (IDF, 2011). Also, the International Diabetes Federation (2008) estimated that there are a minimum of 6 million sufferers in Nigeria. Similarly, the World Health Organization suggests that Nigeria has the greatest number of people living with diabetes in Africa, with an estimated burden of about 1.7 million which will increase to 4.8 million by 2030 (WHO, 2009). However, the Account of Non–communicable Chronic Diseases (NCCDs) revealed that Nigeria is one of the leading countries with regard to the highest number suffering from diabetes and people die unnecessarily.

The prevalence and incidence of type 1 diabetes mellitus in Nigeria ranges between 0.33-1000. Furthermore the prevalence varies in the Nigerian population e.g. Bella (1992) found type 1 to be more prevalent in girls than in boys. While in contrast, Akanji (1996) found it to be more prevalent in boys than girls. According to the observation by Dr. Margaret Chan that Non-communicable Disease NCDs (diabetes) "have changed places" giving to the urbanization lifestyle in the Rural areas (WHO, 2003). It is now globally reported that type 2 diabetes is being diagnosed in children and adolescents (Rosenbloom et al., 1999; Dabelea et al., 1998; Kitagawa et al., 1998). A similar trend in Nigeria was noted in children to be on the increase with death due to diabetes projected to increase by 52% by the year 2015 (Ojofeitimi & Fawole 2009). However, the increasing number of children developing type 2 diabetes could face 40-50 years of treatment, representing a major burden on healthcare systems (Zimmet et al., 2003).

Consequently, diabetes takes a staggering toll on the people in Nigeria and the economic burden is very high (Popoola 2005; Bale 1973; Adetuyibi 1976). It becomes a major concern that the burden of care of the chronically ill is borne entirely by the patient and the patient's family. Such patients are typically poor and cannot afford the cost of managing diabetes and are vulnerable to diabetes complications (Serantes, 1985; Ahuja 1985). More so, the studies of Adetunji et al., (2006) reported that Nigeria has the highest rate of about 85% micoalbuminuria complications. Similarly, a patient's socio-economic characteristics have been linked with worries and psychological symptoms in diabetes studies in Nigeria (Famuyiwa et al., 1985; Ohaeri et al., 1995; Olatawura, 1972). As such, there is clearly a need for studying the socio-economic status of diabetes patients in Nigeria.

In most developing counties, almost 1 in 10 adults (35-64 years old) deaths are diabetes-related, so the impact on the society is enormous (Roglic et al., 2005). Similarly, other studies e.g. (Awah et al., 2007; IDF, 2009) reported absolute and relative mortality rates from diabetes to be higher in 20-39 year age-group – i.e. the most economically productive population. Furthermore, this high prevalence of morbidity and mortality rate among young adults and adolescents in a country, affects the country's workforce and consequently her economy (Lerner et al., 2005; Laveist et al., 2009, Braveman et al., 2011). For instance, Chijoke et al., (2010) conducted a retrospective study on mortality pattern among type 2 DM patients in Ilorin, and their results indicated that type 2 DM is a common cause of morbidity and mortality in Nigeria. The contributory factors to high mortality as observed by Chijoke et al., 2010 were ignorance, poor hygiene, infections, lack of foot care and inadequate glucose control.

Moreover, earlier studies on mortality due to diabetes in the developed nations showed that the psychological impact of diabetes was a good predictor of death, often better than many clinical correlates (e.g. Thomas et al., 2004). Nevertheless, the mortality and morbidity resulting from diabetes with comorbid psychological health e.g. depression are avoidable or at least can be reduced to a minimal proportion (Marmot, 2006). Furthermore, the persistent rate of mortality resulting from diabetes in developing countries like Nigeria is unlikely to decrease significantly unless appropriate health promotion strategies are adopted for the prevention of poor psychological health (e.g. depression). For instance, James et al., (2010) examined the prevalence of depression and its relationship with socio-demographic and clinical correlate among patients with diabetes mellitus attending an out-patients clinic at (UBTH), Benin City, Nigeria. Evidence from the study showed that major depression disorder (MDD) was diagnosed in 30% of patients. In addition, the authors reported that having a lower income and more children were significantly correlated with higher depressive symptoms. However, more studies of this kind are needed in Nigeria including multiple determinants of psychological health (e.g. self- efficacy, sense of coherence and self-esteem) and socio-demographics factors, (e.g. age, sex, marital status, educational level and income.

Moreover, no available studies in Nigeria have examined the interrelationship of psychological health indicators, socio-cognitive and socio-demographic factors in people with diabetes, suggesting that more elaborative studies on this subject are warranted. Consequently, previous reviewed studies (e.g. Yi et al., 2008, Everson et al., 2002) highlighted the need for a better understanding of the relationships between Psychological, Socio-cognitive and Socio-demographic health variables with diabetes, across gender and ethnic groups. However, both local and international studies on this subject noted that there are gaps on the existing studies such as the methodology they employed in those studies and the issues of isolated variables examined (Johnson & Rabi 2007; Martens et al., 2004; Kramer et al., 2008), and that more research is needed. This study adopted a mixed methods approach to address this gap by examining the interrelationships amongst psychological, socio-cognitive and socio-demographic variables of diabetic patients in Nigeria.

Secondly, another reason for carrying out this study in Nigeria, beside that of helping to improve the motarlity rates as implicated with psychological factors observed in the studies of Thomas et al., (2004) is that of providing internationally comparable data and the filling of gaps in literature in terms of the methodologies employed, and issue on isolated variables. For instance, researchers (e.g. Hu, et al 2007) regrettably noted the non- inclusion of various socio cognitive health determinants of psychological illness among diabetic patients such as social support). Conversely, this was further echoed by other researchers e.g. Cheng & Boey (2000) that for achieving an effective reduction of psychological illness in diabetes patients, it is essential to understand the patients' personal, socio-cognitive and socio-demographic health factors and determine if any interaction exist amongst them.

Moreover, despite the evidence of high prevalence of depression and anxiety associated with socio-cognitive factors among diabetes population (Sacco and Bykowski 2010; Kyrios, et al., 2006; Fareeha et al., 2010; Poulsen & Pachana 2012; Zhao, 2006; Hu, 2007; Aziz et al., 2012), few studies are found that examined the prevalence of psychological health indicators in Nigeria (e.g. Agbir et al., 2010;

James et al., 2010). Furthermore, none of these available studies in Nigeria examined the socio-cognitive factors of the diabetic population (e.g. self- efficacy, sense of coherence and locus of control). This lack of critical health information makes it challenging to target programming and interventions where it will be most effective in improving patients' health. A multitude of studies (Delamator et al. 2001; Glasgow et al.,1997; Glasgow, Toobert and Gllette, 2001; Jacobson, de Groot and Samson 1997; Polonsky, 2000) have demonstrated that improvement of the psychological health of persons suffering from diabetes is improbable without considering the proximal socio-cognitive health factors which serve as coping resources that aid the adjustment of diabetes. However, patients with diabetes may vary in adjustment to their illness in psychological and socio-cognitive terms but this is not well-researched and so investigating these variations becomes warranted.

1.5 Why the Study is Focused on a Health Psychological Approach.

The current study stems from the health psychological approach of illness and health. Health psychology is a relatively new discipline, emerging in the context of a challenge to traditional biomedical models of illness. Briefly, these traditional models see illness as arising from external forces (e.g. bacteria) over which the individual has no control (Walker, 1999). There is no continuum between mental and physical aspects of illness and the two are regarded as entirely separate. Consequently, the treatment of illness is solely in the hands of the healthcare professional. In contrast, health psychology views mental processes as not only intertwined with physical processes in illness, but also as a potential contributory factor to both health and illness. The individual is seen as having an active, rather than passive role in the cause, progression and outcome of illness.

The aim of this approach is to understandwhat makes some people with diabetes more able to cope with distressing situation of their condition, what socio-cognitive or socio-demographic factors contribute to the development of depression in diabetes patients, and how to possibly predict whether a person newly diagnosed with diabetes will manage the demands of the condition. These are the type of questions addressed in health psychology which are similar to the objectives for this study. Similarly, the study examined the extent to which beliefs and thoughts embedded in different socio-cognitive factors impact on the psychological health of people with diabetes.

1.6 Models of Health Determinants and Health Promotions Relevant to the Present Study

The aim of this section is to discuss the various models employed in supporting the arguments for this study. The models also cast more light on what underpins the choice of variables studied, and the rationale for the possible health promotional interventions that are recommended in the study. Similarly, the theoretical models incorporated numerous socio-cognitive factors in attempting to understand and predict the psychological health of people with diabetes.

Understanding the complex factors that determine health and wellbeing is encouraged especially when developing health promotion interventions. It also informed the choice of variables examined in the current study. Since health promotion interventions are varied, it will be useful for the clinician to know when to use targeted or universal programmes and how to allocate resources, predictive of health promotion in the population (Lewis et al., 2011, p. 275).

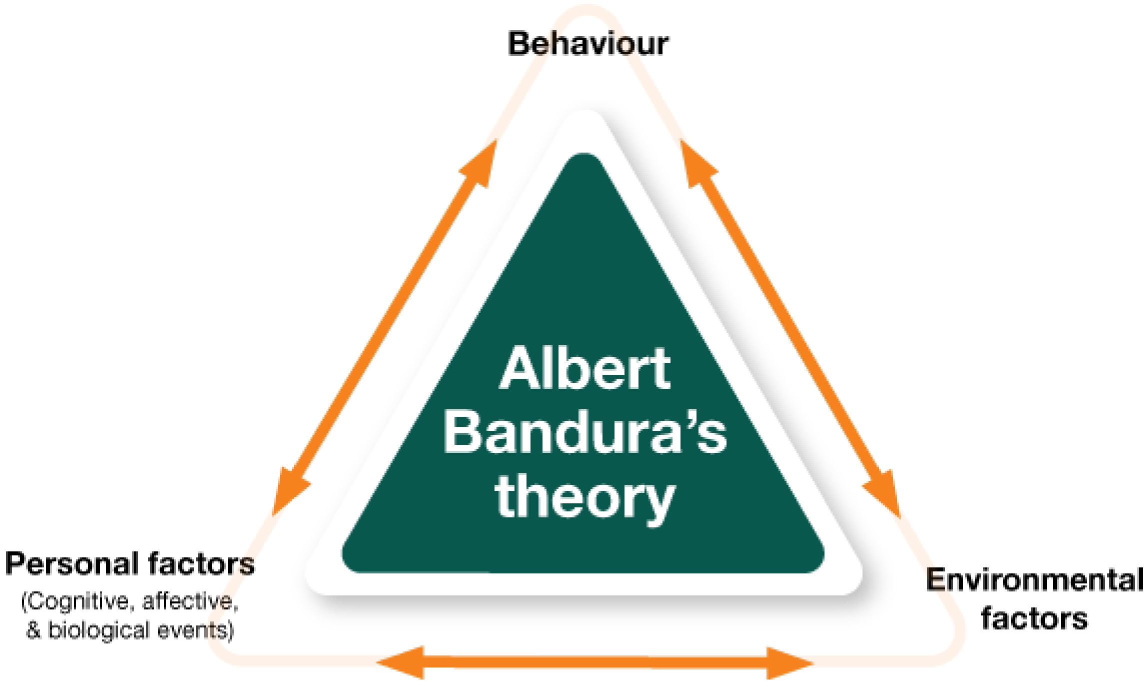
The aforementioned studies provided evidence to support the claim that socio-demographic variables (e.g., gender, ethnicity, socio-economic) play a strong role in individual differences in psychological health (DeBate, Topping, & Sargent, 2005; Von Bothmer, 2005). However, such socio-demographic factors are fixed and they are generally not amenable to charge (Dahlgren & Whitehead, 1991). Similarly, the findings of studies exploring only socio-demographic factors would not necessarily aid clinical practice or intervention, therefore, researchers are currently focusing attention on social cognitive variables, which might explain the individual differences in psychological health that have been previously attributed to socio-demographics (Rosenstock, 1974), since socio-cognitive processes involved in the protection of psychological health were likely to be of major importance (Leventhal and Cameron, 1987).

1.6.1 Social Cognitive Models

The term ‘social cognitive models’ is used to refer to a group of similar theories, which focus on the proximal determinants of Behavior , for instance, self-efficacy and optimism in respect to health and health intervention. These models do not deny that Behavior is influenced by other distal factors (e.g., social structural, and cultural factors), but they assume that the factors of such distal factors are largely or completely mediated by the proximal factors specified by the model. Unlike the distal factors, the proximal factors are assumed to be amenable to change or can be modified in terms of intervention purpose. However, the social cognitive models can be used as the basis for psychological health interventions.

Furthermore, social-cognitive models postulate that coping constitutes a dynamic process (Janoff-Bulman, 1992). Such models reject the assumption that coping is a stable attitudinal trait and place more emphasis on the broader social-cognitive adaptations to a person's 'assumptive world' that confrontation with a severe illness like Diabetes Mellitus necessitates (Parkes, 1988). The assumptive world denotes the cognitive structures that reflect the accumulation of a person's life experiences, influenced by attachment, social and cultural factors that serve as a template for making sense of the world. However, the current investigation draws on a number of such social cognitive models as follows:

Figure 1.1 Wood & Bandura (1989) Triadic Reciprocal Determinism Model Adapted from Redmond & Furnish (2013), p.2.



The first of such model is Wood & Bandura's Triadic Reciprocal Determinism model (1989). This is one of the key theoretical models guiding this current study and the model according to Bandura (1989) emphasizes human Behavior as reciprocally determined by the interaction of three influences: personal, Behavioral and environmental factors. Personal influences include cognitive and affective factors (e.g. self-efficacy); Behavioral influences refer to actions and reactions of an individual (e.g. depression); and environmental influences involve both social and physical factors (e.g. social structure/social economic position). In other words, human functioning is the result of the interaction among all three of these factors (Crothes et al., 2008). Furthermore, Wood and Bandura, (1989) argued that the influencing factors are not of equal strength, nor do they all occur concurrently. However, while it may seem that one factor is the majority, or lead reason, there may be numerous factors that play a role in human Behavior. Similarly, in this model of reciprocal causality, the internal personal factors; Behavioral patterns, and environmental events all operate as interacting determinants that influence one another bi-directionally.

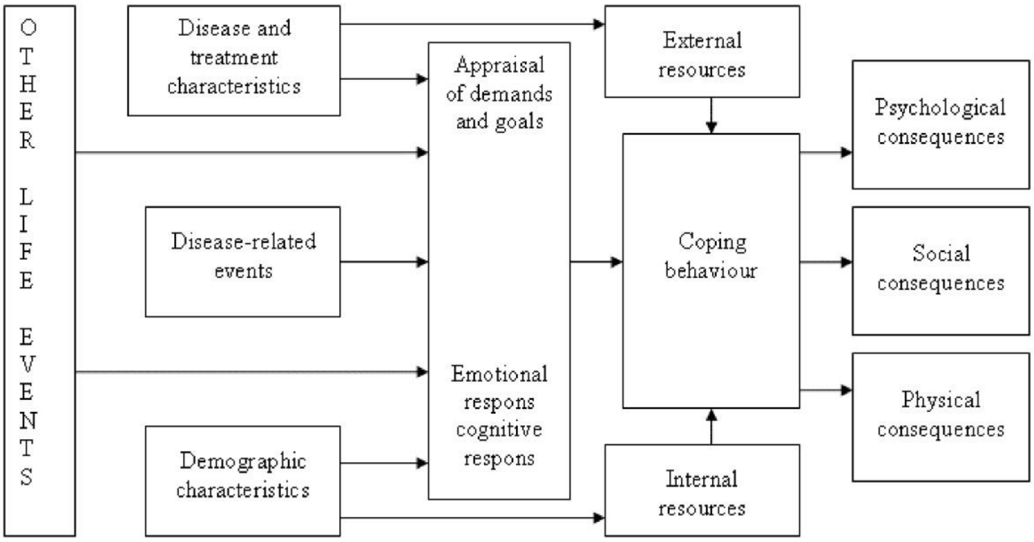
More so, the socio-structural theories which is seen as the patterned social arrangements in a society that are both emergent from and determinant of the actions of the individuals with regard to the socio-cognitive theories are often seen as rival conceptions of human Behavior or as representing different levels and proximities of causation(Bandura 2001). Human Behavior cannot be fully understood solely in terms of socio-structural factors or psychological factors i.e. (human health is a social matter not just an individual one). A full understanding requires an integrated causal system in which socio-structural influences operate through socio-cognitive mechanisms to produce Behavioral effects. Similarly, the self-system is not merely a conduit for external influences. However, the self is socially constituted but, by exercising self-influence, human agency operates generatively and proactively on social systems, not just reactively.In contrast to models which focus either on socio-structural or psychological factors, in this Triadic Reciprocal Determinism (TRD) Model of causation, socio-structural and personal determinants are treated as co-factors within a unified casual structure. For example, poverty is not a matter of multi-layered or distal causation. Lacking the money to provide for the subsistence of one’s family or paying for diabetes medication impinges pervasively on everyday life in a very proximal way. Similarly, diverse lines of research lend support to this interdependent multi-causality (Baldwin et al., 1989; Bandura, 1993; Elder and Ardelt, 1992).

This theory goes well beyond individual factors in health behavior change to include environmental and social factors. In fact, this theory may be the most comprehensive model of human behavior yet proposed and is similar with that of Bandura's Social Cognitive Theory (SCT) Bandura (1986) which is a behavioral prediction theory that represents a clinical approach to health behavior change (Fishbein et al., 1991). This theory has been widely applied to health behavior with respect to prevention, health promotion, and modification of unhealthy lifestyles for many different risk behaviors. SCT emphasizes what people think and its effect on their behavior (Perry, Baranowski, Parce (1990).SCT proposes that behavior can be explained in terms of *triadic reciprocity* between three key concepts which operate as determinants of each other. *Reciprocal determinism* forms the basic organizing principle of SCT. This important concept states that there is a continuous, dynamic interaction between the individual, the environment, and behavior. Thus, a change in one of these factors impacts on the other two. SCT involves numerous key concepts, which have been associated with each of the three main constructs which include: personal characteristics, emotional arousal/coping, behavioral capacity, self-efficacy, expectation, expectancies, self-regulation, observational/experiential learning, and reinforcement (Baranowski, and Parce 1990).

In SCT, the relationship between behavior, person, and environment is interactive. For instance, in a situation whereby a young person develops type 2 diabetes, it denotes an accurate picture on how variables associated with the individual’s (e.g., personal characteristics, interact with the environment and behavior). The type of influences on behavior which involve the *environment* can be physical, social cultural, economic, and political in nature (Ockene and Ockene 1992) or situational in nature. In SCT, the person's perceptions of the environment are referred to as *situations;* this key variable can facilitate or inhibit behavior. In this reciprocal, interactive scheme, in which multiple determinants of behavior are assumed, *behavior* also exerts an influence on both the environment and the person. The environment and past experience with a particular behavior can also provide reinforcement for acting in a particular way. An individual's performance of associated behaviors can have an important impact on disease prevention. For example, engaging in exercise can trigger hunger, stimulating the desire for high fat food. To effectively prevent disease, an individual needs to engage in multiple healthy behaviors like exercise adoption, and eating habits etc. SCT assumes that most behaviors are learned responses and can be modified. Thus, learning through observing the behavior of others (i.e., modeling) is important from a SCT perspective. SCT also places heavy emphasis on learning both cognitive and behavioral skills for coping with situations and making changes in health behavior. Conversely, economic condition, socioeconomic status and family structure affect reactive Behavior e.g. (depression) through their impact on people's aspirations, sense of efficacy and other self-regulatory factors rather than directly. For instance, patients' psychological health indicators or reactive (Behavioral factors) are influenced by how the patients themselves are affected in (cognitive factors) and, by social context (environmental factors).

The current study operationalized the model of Triadic Reciprocal Determinism (TRD) with measures for personal factors including perceptions of self-efficacy, and locus of control; the Behavioral reactions includes depression, and stress; and that of environmental factors including the measure of social support. These measures were judged to be essential since the Triadic Reciprocal Determinism (TRD) views stress reactions in terms of perceived inefficacy to exercise control over threats and taxing environmental demands. This means that,, if patients believe they can deal effectively with potential stressors they are not perturbed by them,but if they believe they cannot control aversive events they distress themselves and impair their level of functioning.

Figure 1.2 Maes, Leventhal and De Ridder (1996) Stress-Coping Model (Adapted from Peeters, Boersma and Koopman 2008, p.2).

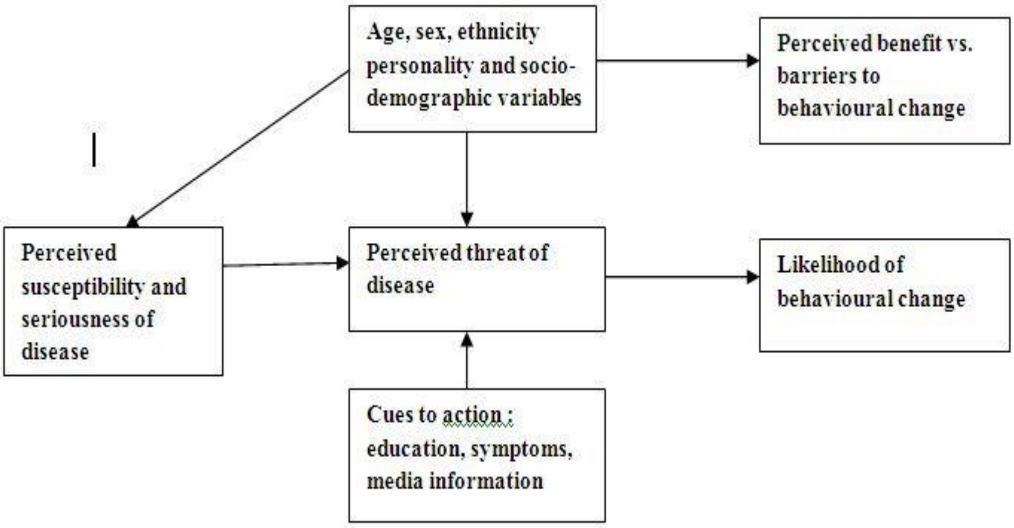


The current study also employed the stress-coping model of Maes, Leventhal and de Ridder (1996) see (Figure 1.2). According to this model, other life events, disease characteristics, disease-related events, and demographic characteristics are linked to the appraisal of demands and goals in regard to the illness. In addition, all factors are directly or indirectly related to coping Behavior, which itself is also moderated by external- and internal resources. Equally, all these factors together contribute to psychological, social and physical consequences of Health Related Quality of life (HRQoL)**.** The term HRQoL emerged from the broader concept of general Quality of life(QOL), and is, by definition, more focused on aspects of life quality that are influenced by or that can influence one's health status directly (Bergner, 1989).

This model postulates that adjustment is determined by the relative use of problem-focused and emotion-focused coping strategies, the selection of which is not only a function of the appraisal of the stressor but also of a person's social context and representation of the disease (Maes, Leventhal & De Ridder, 1996). The adoption of this model was based on its relevance with the study population as many people with diabetes are confronted with one or more chronic diseases stressors. This means that diabetic patients must learn to live with their condition over an extended time-course of years without the prospect of recovery. As such, living with diabetes imposes many threats and challenges to patients such as dealing with uncertainties about their present and future physical capacities, sustaining relationships with family and friends, dealing with pain and other symptoms, and concerns about their abilities to resume their former lifestyle (Devins and Binik, 1996; Moos and Schaeffer, 1984). These consequences of suffering from diabetes can be studied by the perspective of stressful situations. That is, diabetes may be viewed as a major stressful life event, characterized by a number of recurrent stressful situations that pose serious challenges to adaptation (Ridder et al., 1998; Moos and Schaeffer, 1984; Zautra, 1996). Diabetic patients have to cope with these stressful situations and, depending on the results of their coping efforts; they may be able to maintain adequate levels of physical, social, and emotional functioning.

In terms of the stress-coping model of Lazarus (Lazarus and Folkman, 1984) much research has been done on coping and adjustment of patients with chronic conditions (for a review, see Ridder and Schreurs, 1996; Maes et al., 1996). Although this research intend to provide valuable insights into the ways patients cope with their diabetes illness and the effects of coping on diabetes illness adjustment, it aided in determining the precise value of such a wealth of information for diabetic conditions.

Figure 1.3 Rosenstock (1966) Health Belief Model
Adapted from Glanze, Rimer and Lewis (2002, p.52).



An additional model underlying the current investigation is the Health Belief Model (HBM) (see Figure 1.3), a cognition model that attempts to explain and predict health Behavior by focussing on the attitudes and beliefs of individuals (Rosenstock, 1974). Accordingly, the HBM as a conceptual formulation for understanding why individuals do or do not engage in a wide variety of health related actions or reactions, and provided considerable support for the model. The model has been applied to patients' responses to symptoms (Kirschi, 1974), and the basic components of the HBM are derived from a well-established body of psychological and Behavioral theory whose various models hypothesize that Behavior depends mainly upon two variables: (1) the value placed by an individual on a particular goal; and (2) the individual's estimate of the likelihood that a given action will achieve that goal (Maiman and Becker, 1994).

HBM in the current study was conceptualized in the context of health-related Behavior, and the correspondences are: (1) the desire to avoid illness (or if ill, or get well); and (2) the belief that a specific health action will prevent (or ameliorate) illness i.e., the individual’s estimate of the threat of illness, and of the likelihood of being able, through personal action, to reduce that threat). The health belief model, (Rosenstock, 1974; Becker & Maiman, 1974; Janz & Becker, 1984) proposed the six determinants of Behavior as follows:

1. Perceived susceptibility: this deals with the individual’s strong opinion that he/she may contract an illness unless there is a change in Behavior that predisposed to such an illness. For instance, when diabetic patients truly believe that diabetes is occasioned by lifestyle and that it can be a serious disease if it is not well controlled, resulting in fluctuation of glucose level and complications then change on the right health direction may be initiated in achieving optimal control.

2. Perceived severity: in this case, Behavior change may occur to the extent to which an individual perceives the consequences of having diabetes mellitus which will have a bad effect on their future health. For instance, when the patients are made to understand that the consequences of uncontrolled diabetes include long suffering with complications and death.

3**. Perceived benefit**: it assumes that change would occur when the individual is convinced that the change and the action intended will produce a positive result to spare him/her from the illness. For instance, when diabetes patients believe that they can control their diabetes if they can change their lifestyle, it will probably help in the improvement or prevention of poor glycaemic control, and give one confidence in adjusting and adhering to medications. Eventully, such perceived benefit will motivate them to take positive health action.

4. Perceived barriers: it is possible that health changes as revolutionary changes in the society will be resisted and the road to such changes is strewn with difficulties. However, in the case of health change, the barriers are presented in form of psychological, physical or financial barriers. Diabetic patients who believe that taking insulin or oral medication interferes with his/her normal daily activities and is thus a ‘barrier’ to such activities may react in a stressful way or become depressed.. However, the aforementioned barriers can be broken through education, and counselling on how to adjust in coping with situation.

5. Cues to action: according to (Niven, 2000, p.119) these are stimuli that can trigger appropriate health Behavior. Such stimuli may be internal (e.g., increasing awareness of the link between poor glucose levels and complications), or an acute admission to hospital as a result of poor advice from an external sources or ignorance of self-management methods.

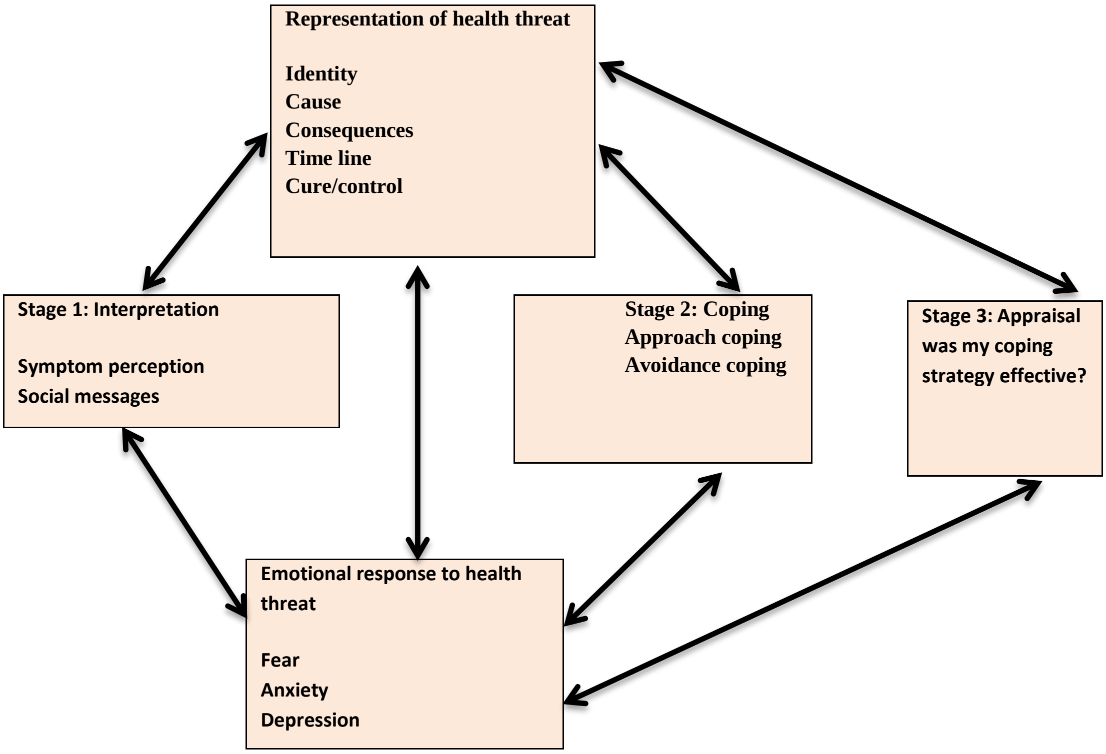
6. Diverse factors: most of the factors in this group include socio-demographic, and personality factors that may influences health (Niven, 2000, p.119). While some factors such as gender or ethnicity are difficult to influence, other factors such as social and personality factors can be influenced. For instance focusing on diabetic' self-efficacy, self-esteem, and optimism through psychotherapy, may encourage patients to initiate, follow and sustain positive health changes.

Similarly, Armitage and Conner (2000) argued that what is implicitly in the conceptualization of (HBM) is the combination of perceived susceptibility with perceived severity (to produce perceived threat), and the combination of perceives benefit and perceived barriers (to determine evaluation of the course of action taken). Armitage and Conner (2000) further argued that health Behavior is more likely if: (1) the individual perceived threat of disease (i.e. high susceptibility and severity). (2) If benefits can be derived from performing the Behavior or where there are few barriers to overcome in performing the Behavior. Consequently, if an individual is motivated health wise, then health Behavior en-action becomes possible. Similarly, that cues to action such as symptom perception or health communication may propel an individual for performance of the Behavior (Armitage & Conner, 2000). In other words, HBM is based on three assumptions, that a person will take a health related action if that person: (1) feels that a negative health condition (e.g., poor glucose control and complication) can be avoided. (2) has a positive expectation that taking a recommended action, he/she will avoid a negative health condition (i.e., engaging in physical activity if required (3) believe that he/she can successfully take a recommended health action (e.g. adherence to insulin or oral glycaemic). Similarly, this model is favoured by Health psychologists (e.g. Becker and Janz 1984; Adejoh 2014), because it sees patients taking an active role in managing their own condition. More so health promotion comprises of all these activities that intend to prevent disease, improve health and enhance well-being (Naidoo & Wills 1998 p.3).

According to the World Health Organization, health promotion is the process of enabling people to increase control over and to improve their health' (WHO, 1986).

The present study aimed to specify or link the socio-cognitive health indictors' e.g. self-efficacy and locus of control - that are embedded into the health beliefs system of people with diabetes in order to understand their health outcomes. More so, Health beliefs model is related with this current study population and as such was examined, in relation to other psychological factors rather the Behavioral demand such as compliance which implied ‘cue to action’ more so, the socio cognitive framework for understanding patient compliance is linked to the Health Belief Model, which is based upon the value an individual places on the identified goal and the likelihood that compliance will achieve that goal. This model is been useful to explain on compliance, to make an “educational diagnosis," and for designing compliance-enhancing interventions.

Figure 1.4 Leventhal, Meyer, Nerenz (1980) Self- Regulatory Model Adapted from Ogden (2000, p.416).



Yet another health-psychology models that is increasingly being used to understand and predict individual’s coping with chronic illness and may be very useful for the current project is the Self- Regulatory Model (Leventhal et al., 1980) (see Figure

1.4). This model postulates that individuals create mental representations of their illness, which guide the development of illness coping Behaviors and outcomes. Illness beliefs representations are structured around four components:

Identity: Beliefs concerning the illness label and associated symptoms.

Cause: Beliefs regarding possible causes of the illness: heredity, environmental factors, and lifestyle.

Consequences: Beliefs regarding the perceived physical, psychological or financial consequences of the illness.

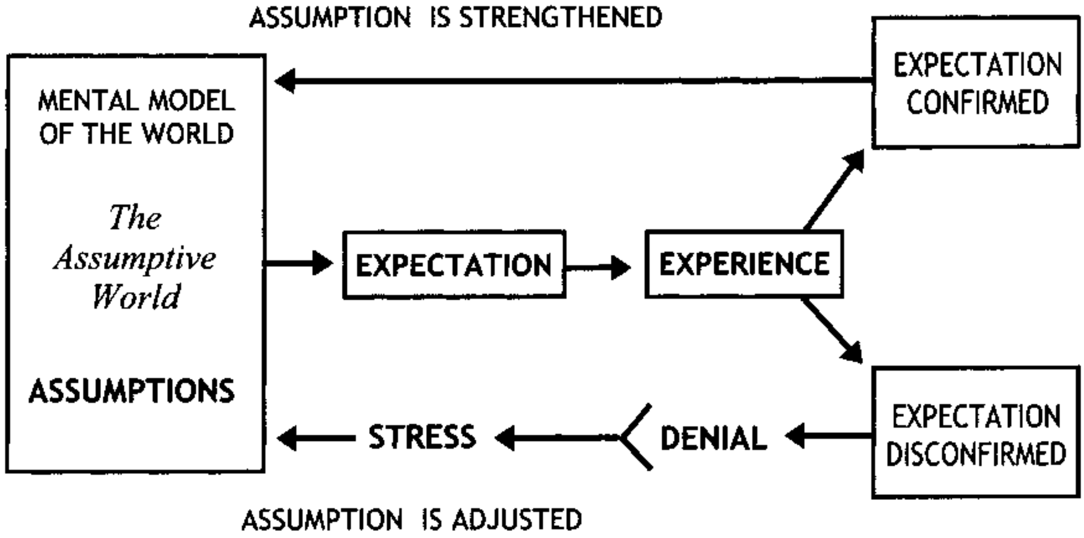
Time line or course: Beliefs regarding duration of the illness: acute, cyclic (symptoms may subside, then recur) or chronic. This domain includes views on the variability and predictability of the condition.

Similarly, Lau and Hartman (1983) in working with patients with acute illness added a fifth component:

Curability or controllability: To what extent the condition can be cured or controlled by the individual or treatment. Central here are beliefs about the effectiveness of treatment, referring to the management regime in its widest sense, including whether the clinical advice is helpful, attending clinic is worthwhile, etc. Perceived control includes perceptions of personal control (confidence in self-management) and treatment effectiveness. However, SRM of Leventhal et al., (1980) is considered as the proximal determinants of coping Behavior, which, in turn, influence a host of medical, psychological and Behavioral variables (Hagger and Orbell, 2003; Scharloo and Kaptein, 1998).

Also in this model, the authors consider adjustments to illness that is, ways in which people can handle their illness. For example, people whose illness representations include reference to disability, and endorse these as relevant to themselves, are those who are depressed. Similarly, there is a consistent literature that suggests that depressed people attend to more negative information than their non-depressed counterparts (Matthews and Antes, 1992). Conversely, individuals with high level of anxiety attend more to threat-related information compared to low-anxious individuals (e.g. Bradley, Mogg, and Millar, 2000). This research provides strong support for the major tenets of the SRM. However, across a range of disorders there is evidence that beliefs about identity cause of the illness, consequence, timeline and control are linked into the socio-cognitive factors which are the determinants factors of psychological health and emotional well-being of people in all ages. Although, the current investigation rely on aspects of this model to acquired and interpret the data.

Figure 1.5 Social Cognitive Transition Model
(SCT) Brennan (2001) adapted from Brennan (2001, p. 8).



Another model of potential value for the current project is the Social Cognitive Transition Model (SCT) model which is a psychosocial framework that attempts to explain both positive and negative adjustment experiences among people with chronic disease e.g. cancer patients (see Figure 1.5). According to Brennan (2001), neither coping models nor social-cognitive models adequately account for the vast individual differences in the extent to which confrontation with a severe chronic illness (diabetes) renders some, but not all, people vulnerable to the development of psychological distress. He notes that some people appear to be more adept at negotiating the dramatic changes forced upon them when struck by illness, and undergo a positive transformation characterised by a sense of personal growth. The positive effect of the use of cognitive coping processes such as positive re-appraisal on adjustment to DM lends support to this notion. Additionally, evidence suggests that the identification of benefits such as improved relationships with family, increased compassion, and enhanced appreciation of life, is associated with positive re-appraisal (Mohr et al., 1999). According to the SCT model, when we make a prediction based on our assumptions, they will either be confirmed or disconfirmed by subsequent experience. If the expectation is confirmed, the assumption is strengthened. If the expectation is disconfirmed, this may lead to a period of disorientation and stress while the assumption is adjusted to take account of the new experience. Short-term denial and avoidance can allow the intensity of the experience to be weakened, therefore reducing distress and facilitating adjustment.

Drawing on the assets of social cognitive model (SCM), Brennon (2001) developed the social-cognitive transition model (SCT) in an attempt to bridge the theory-practice link in the context of physical illness. SCT holds that individual differences in response to illness are a function of the relative influence of a complex matrix of factors including a) the construction of a person's assumptive world, b) the composition of the social contexts through which a crisis is experienced, and c) the characteristic styles of responding inherent in the person faced with it.

The model proposes clear directions for psychosocial interventions purported to foster change at intra-psychic and interpersonal levels. For example, in light of the consistent evidence that self-efficacy and personal control are associated with active coping and reduced distress, the model suggests that psychosocial interventions should focus on helping people resume a sense of control and re-appraise the meaning of control to accommodate the actual losses and the associated sense of uncertainty experienced in respect of the future. Reflecting the psychosocial ethos of the model, the model further suggests that interventions should place a greater emphasis on the positive and negative transitions that take place in people's social contexts. This is consistent with evidence that re-appraisal of close attachments foster more valued and intimate relationships (Moorey & Greer, 1989), and that social support is an effective buffer against the effects of stress (Cohen & Wills, 1985).

1.6.2 Implications of Different Health Determinant Models for the Present Study: Triadic Reciprocal Determinism model (Wood & Bandura (1989), Stress-Coping Model (Maes, Leventhal and De Ridder 1996), Health Belief Model (Rosenstock 1966), Self- Regulatory Model (Leventhal, Meyer, Nerenz (1980), and Social Cognitive Transition Model (Brennan 2001).

These socio-cognitive models identify health determinants and their pathways of influence. Consequently, by addressing the underlying causes of ill health, a preventative and early intervention focus can be achieved (Lewis et al., 2011, pp. 280-286). The models have been instrumental in identifying health inequalities which have informed and contributed to health promotions, strategies, interventions and policy changes (Lewis et al., 2011). In addition, studies have shown that the role of health promotion in relation to improving the determinants of health may include advocacy, health education, and counselling services that employ the promises of those models (Tones, 1990; Lewis et al., 2011).

In relation to the present study, these models provided information underpinning the choice of variables included for the study and the pathways by which health promotion interventions can be targeted.

1.6.3 Implications for Research

Evidence from literature has shown limited explanatory research on the socio-cognitive determinants of psychological illness among diabetic patients in Nigeria (e.g., James et al., 2010). Consequently, more research will be of interest regarding the pathways through which the aforementioned factors affect diabetic patient's health. According to Marmot (2006), such research could potentially become synthesised with strategy development and policy implementation. Similarly, it is assumed that the current study will provide evidence needed in prescribing interventions that may be effective in modifying the socio-cognitive determinants of health to promote good psychological health among people with diabetes mellitus. Specially, the Health Belief Model provides a useful framework for understanding some of the factors that influence the extent to which diabetic patients will make Behavioral changes that can prevent disease progression. We can use the model to help frame discussions with patients which lead to joint decision-making about how to work together to prevent disease progression.

The research informed by coping models suggests that coping comprises a complex, dynamic, and multifaceted process. More so, the theoretical models such as the SCT have clinical value by aiding our understanding of the individual differences in adjustment to severe physical illness and offering directions for therapeutic interventions, although the hypotheses derived from it are endless and do not neatly map onto a single therapeutic intervention. Indeed, Brennan (2001) admits that there are many gaps in the SCT and that the way in which illness affects core assumptions remains poorly understood.Furthermore, despite the contribution towards the chronic models, these models adapted for the current do not support appropriate care delivery and it will continues to suffer for the tyranny of the urgent Bodenheimer, Wagner et al., (2002). However, this models fails to explicitly acknowledge the potential between socio-cognitive and health professional factors, and the impact this may have on patients psychological and Behavioral responses.

1.7 Why the Study will Examine Patients' Psychological Health, Socio-cognitive Health and Socio-demographic Factors in Nigeria?

As noted earlier, diabetes is a common and progressive long-term condition, which places a significant burden of self-management on the individual by exacerbating psychological impact of the disease progression. Thus the link between diabetes and psychological burden appears to be a vicious cycle and we need to identify ways to reduce this burden. In addition, understanding the psychological health of people with diabetes, research is need to establish a greater understanding of perceptions and misconceptions among people with diabetes, their health beliefs (e.g. perceived severity of disease, perceived self-efficacy of treatment), and aspects of positive socio-cognitive health (such as sense of coherence, optimism, locus of control and personal values (e.g. self-esteem) which inform their self-management and willingness to engage with treatments as recommended by health care professionals. Surprisingly, such research has been concentrated for the most part in the US and Europe, with no or very little being conducted in Africa specifically in Nigeria. Furthermore, studies that examine diabetic patients' psychological health and socio-cognitive health shave significant implications both theoretically and practically. Such studies are expected not only to contribute to a better knowledge of the prevalence and the relationships of the concepts in question, but will be applied in formulating policies and programs aimed at helping diabetic patients to live and adjust psychologically in the presence of their chronic condition.However, there are strong criticisms against most studies that have investigated the impact of socio-cognitive factors on the psychological health in people with diabetes on the ground that majority of the researchers employed only crude analysis in their study (Kouvonen, et al., (2008) in particular the argument is that such studies can hardly be compared with each other in terms of sample selection, measures and methods of analysis. Alternately, such studies do not provide sufficient information regarding possible differences in self-rated psychological health and the factors associated with it across countries (Steptoe et al., 2001).

In addition, there is a need to provide a cross- country comparative data on diabetic patient's psychological health and socio-cognitive factors, similar to the European studies conducted by Sacco et al., (2005). Regrettably, in Nigeria, there are no such data. However, to fill this gap in knowledge the current study selected variables that are reported to potentially influence the diabetic patient's health perception (e.g. self-efficacy that is, a cognitive perception of the self's abilities; self-esteem that is, an emotional perception of the self, and other aspect of socio-cognitive factors such as, religiosity, social support, sense of coherence, locus of control, optimism, and socio-demographic factors that may be related to psychological illness (e.g. depression, and stress). More so, based on the information obtained from extant literature review, the current study assured that the variables selected for inclusion are those that have validated items. Similarly, the current study employed a mixed method approach. As a pioneering study in Nigeria the rigors and the scope of the current study was a challenge. There is no doubt that the findings will be comparable across-country base line information, with regard to Nigeria diabetic population.

The second reason for studying diabetic patients' psychological health and socio-cognitive health was motivated from the literature on the high prevalence of depression, anxiety and stress associated with socio-demographic and socio-cognitive factors in people with diabetes. For instance, studies from Nigeria Issa et al., (2007), and James, et al., (2010) found that 30% of diabetic patients and 9.5%, of diabetic patients who had a lower income and more children reported higher depressive symptoms respectively in their studies.Additionally, the examination of diabetic patients' psychological health is vital for effective self-care management and evidence showed that good psychological health is an important factor for the achievement of better glycaemic control (Cohen and Kanter 2004). Furthermore, depression and anxiety are associated with self-efficacy (Lewko et al., 2012). Similarly, low social support is significantly associated with the development and maintenance of depression (Lustman et al., 2000). However, it is assumed that promoting the socio cognitive health such as, self-efficacy, will lead
to effective management of psychological illness.

Moreover, the studies of Singh & Kluding (2013), and Lasselin et al., (2012) reported higher prevalence of fatigue among people with diabetes. Similarly, other researchers e.g. Wisconsin & Indiana (2002), and Plantinga et al., (2012) found high prevalence of insomnia among diabetic patients. However, no study has elucidated the prevalence and the severity of fatigue and insomnia in Nigerian diabetic population. Consequently, researchers from Nigeria (e.g. Chinenye, et al., 2012); and other nations (e.g. Hu, et al., 2007) have called for the assessment of more psychological burden and its determinant factors in people with diabetes. Additionally, most studies from other nations sampled patients across the general population (e.g. Verma et al., 2010); in contrast to the Nigerian studies which were regionally based (Issa et al., 2007). Therefore, national wide data are desirable for Nigerian diabetic population and are presently lacking.

1.8 Why the Study Examined Ethnicity Differences?

One other variable that may be important in respect to the study of diabetes in Nigeria is ethnicity. Ethnicity is a cultural variable that refers to, “a common ancestry through which individuals have evolved shared values and customs it is deeply rooted to the family through which it is transmitted” (McGoldrick & Giodano 1996, p. 1). Ethnicity also confers a sense of identity and belonging and a sense of “peoplehood,” and it transmits core systems of cultural beliefs, values, norms traditions and customs, which in turn can also influence health-related Behaviors (Harwood 1981).

Nigeria’s estimated population is of 150 million people (Abdulmalik et al 2013). It is a multi-ethnic country with Ibo in the East, Yoruba in the West and Hausa/Fulani in the North, representing the three major ethnic groups which constitute 62% of the population, while the Edo, Ijaw, Ibibio, Ebira, Nupe, Gwari, Itsekiri, Urhobo, Igala, Idoma and Tiv comprise 33%; and other minorities the remaining 5% (Random House, 2002; Arikpo, 1967; Bangdiwala, Fonn, Okoye, and Tollman, 2010). These ethnic differences may be a critical factor in diabetes management. While, Fishers et al. (2001) found associations between depressive symptoms and aspects of health-related quality of life in people with diabetes mellitus to be similar across different ethnic groups, other studies have found differences.

Accordingly, studies across the globe have reported the association between ethnic groups and psychological health indicators. For instance, Wee et al. (2006) found that ethnicity significantly associated with HRQoL both before and after adjusting for the influence of age, gender, and education, as well as other potential determinants of HRQoL. For example, a significant association between depressive symptoms in diabetes and ethnic group has been observed by researchers e.g. (Black, 1999; Harris, 2001). In this regard, the studies of Grandinetti et al., (2000) observed that the prevalence of depressive symptoms was significantly higher among native Hawaiians with type 2 diabetes compared to those with other chronic illnesses and those without chronic illnesses. Similarly, the International Diabetes Federation (IDF, 2002), reported that sub-group of people with diabetes is more psychologically vulnerable than the others. Equally, Baradaran et al., (2006) reported that in the UK, all ethnic minority groups with diabetes have a higher rate of depression than the general population. However, this remains to be elucidated in a Nigerian context. It is hoped that the examination of ethnic differences in the relations between psychological health and socio-cognitive factors in people with diabetes in Nigeria will help in providing important information for addressing culturally appropriate treatment and intervention programs to improve delivery of health services. Therefore it is clearly warranted for this current study to ascertain if there are ethnic differences in these variables for Nigerian diabetic patients.

1.9 Why the Study Examined Gender Differences?

Gender may also be a key variable in diabetic health. Nevertheless, the literature review shows contradictory findings in regard to gender. For instance, the studies of Clarke & Goosen (2008); Samuel-Hodge et al., (2008) in diabetes found no significant differences between males and females on the problem-focus coping, emotion-focus coping. Similarly, Kolawole et al., (2009), and Odili, et al., (2010) found no gender differences in overall patient’s quality of life. Furthermore, studies conducted across the globe among diabetic population showed contrast results e.g. Naughton et al., (2008) found that health related quality of life were lower for females but higher for males. More so, Papadopoulos et al., (2007) conducted similar studies in people with diabetes and reported that female gender had impaired health related quality of life. More so, the studies of Enzline et al., 2002; Gafvels and

Wandell 2006; DeCoster and Cummings 2004) found that males and females differed significantly in their overall coping strategies. In addition, Nefs et al., (2012) found that less social support associated with stressful life events, and high level of depression and anxiety in female, which contrast, to the studies of Collins-McNeil (2008), who found no gender differences in association between social supports and anxiety. However, no available studies in Nigerian diabetes population to have assessed if there are gender differences in the relationship between socio-cognitive (e.g. coping styles), and psychological health indicators (e.g. anxiety). It is of importance that gender-sensitive approaches to diabetes are needed to effectively identify and address the needs and priorities of both females and males.

1.10 Relationship Between Ethnicity and Gender

Another reason for the focus on ethnic and gender differences, is that ethnicity and gender are important covariates that should be considered in any analysis of the relation between socioeconomic position (SEP) and health. Evidence suggests that many of the observed, gender, and ethnic differences in health may be explained by differences in SEP, although each of these demographic characteristics may exert an independent influence as well (Krieger et al., 1997; Kennedy et al., 1998; Kington & Smith1997). Consequently, most of the studies across the globe have investigated ethnic group and gender as influence determinants on health rather than their varied differences in the relationship between socio cognitive and psychological health. However, this current study examined ethnic and gender differences as to determine their variations in terms of socio-cognitive factors, socio-demographic and psychological illness. This lack of information on such interrelationships in the Nigerian context among diabetic population warrants this approach.

To sum up, the project will examine several groups of variables of relevance, that comprises of both psychological health (e.g. depression and anxiety); and socio-cognitive factors (e.g. sense of coherence and self-efficacy). Further details on how these variables will be measured are provided in chapter four but the measures are also listed in table 1.1 below for reference. More so, a mixed methods of quantitative stance followed with the qualitative stance is the basic approach adopted for the study and the research questions for the two approaches are detailed below.

Table 1.1 **Summary of the Variables Examined in the Current Study**

Variable Group	Variable type	Measuring tool	Adapted from
PSYCHOLOGICAL HEALTH:	Depression	M-BD1	Beck et.al., (1996)
	Anxiety	GAD-7	Spitzer et.al., (2006)
	Stress	PSS	Cohen et.al., (1983)
	Insomnia	ISI	Morin et.al (2001)
	Fatigue	FAS	Michielsen et.al (2002)
	Quality of Life	WHOQOL-BREF	WHO, (1991)
	Life Satisfaction	SWLS	Diener et.al (1985)
SOCIO-COGNITIVE HEALTH:			
	Sense of Coherence	SOCS	Antonovsky et.al(1987)
	Health Locus of Control	MHLOC	Wallston et.al (1978)
	Self –esteem	RSES	Rosenberg, (1965)
	Coping	Brief COPE	Carver, (1997)
	Self-efficacy	GSES	Schwarzer &Jerusalem (1995)
	Optimism	LOT-R	Scheier et.al (1997)
	Religiosity/Spirituality	DUREL	Koenig et.al., (1997)
	Negative Religious Coping	NRCOPE	Paragament et.al (1998)
	Social Support	MOS Social support Survey	Sherbourne &Stewart (1991)
SOCIO-DEMOGRAPHIC:			
	Region/Ethnicity	REN	O’Mally &Johnston (1999)
	Gender	GE	Son &Wilson (2011)
	Socio-economic status	Monthly income	Cunningham et.al (2008)
	Marital Status	MS	Osborn et.al (2011)
	Age	AG	Son &Wilson (2011
	Employment Status	EMS	Cunningham et.al (2008
	Educational status	ES	Son &Wilson (2011)
	Religion	RL	Afolabi et.al (2008)

1.11 The Purpose of the Study

The study aims to ascertain if there are ethnic, gender and type of diabetes differences in psychological, socio-cognitive and socio-demographic factors and to assess the correlates and contextual factors among diabetes out-patients attending University Teaching Hospitals in Nigeria. To the author's knowledge based on existing literature, the current study is groundbreaking as it sets out to examine diabetes patient populations, by a large sample size, large geographical coverage and large number of variables simultaneously, which very few researchers have delved into. The study employed a mixed method sequential explanatory design and the outcome aimed to contribute to evidence of knowledge about diabetic self-care management. This study intends to offer insight into a new approach to help diabetic patients in Nigeria for efficient management of their condition, and to fill the aforementioned gaps in literature. The following Questions/Hypotheses will be addressed.

1.12 Research Questions

The questions used to guide the study were:

1.12.1 Phase 1: Quantitative

1. What is the pattern of psychological health as determined by diabetic patient's socio-demographic and socio-cognitive factors?
2. To what extent may differences in psychological health (e.g., depression) among diabetic patients in Nigeria be explained by gender, ethnicity and type of diabetes?
3. To what extent may differences in socio-cognitive factors (e.g., self-efficacy) among diabetic patients in Nigeria be explained by gender, ethnicity, and type of diabetes?

1.12.2 Hypotheses

1. There will be a significant difference in the pattern of psychological health factors of diabetic patients' socio-demographic and socio-cognitive factors.
2. There will be a significant difference in the psychological status between diabetic patients in Nigeria by gender, ethnicity and type of diabetes.
3. There will be a significant difference in socio-cognitive factors between diabetic patients in Nigeria by gender, ethnicity and type of diabetes.

1.12.3 Phase 2: Qualitative

1. What are the contextual explanatory factors perceived to have underlain the gender, ethnicity and type of diabetes differences observed in the psychological status and socio-cognitive health of the participant in the quantitative phase 1 of the study?

CHAPTER TWO

LITERATURE REVIEW ON PSYCHOLOGICAL AND SOCIO-COGNITIVE HEALTH INDICATORS OF DIABETES MELLITUS PATIENTS

2.0 Introduction

This review is focused on those psychological and socio-cognitive variables mentioned in Chapter one (table 1) which are: (depression, anxiety, stress, fatigue, insomnia, life satisfaction, quality of life, self-efficacy, religiosity, social support, sense of coherence, coping self-esteem and optimism). The available literature was reviewed and areas of controversy and gaps in knowledge that the current study addressed were identified. The information obtained from previous studies helped to shape and structure the current study. In addition, the findings of previous studies where referred to in the discussions of the findings of the current study and for comparing studies conducted in other nations with those in Nigeria by other researchers in relation to diabetic patients socio-cognitive, psychological health and socio-demographic health factors.

2.1 Depression

2.1.1 Theoretical Framework

Across the field of psychiatric and clinical psychology, there are a variety of positions that have been advanced on what constitutes depression. However, in most of the studies, no working definition is offered at all, although a range of symptoms are explored. This approach is evident in the writings of some biological theorists (e.g. Golden & Janowsky, 1990) as well as some who are more psychologically orientated (e.g. Beck *et al.*, 1979). This failure to provide a clear definition implies that the concept of depression has a self-evident validity. However, closer inspection reveals that different authors assign primacy to different psychological phenomena when writing about depression. For example, some texts insist that it is primarily a disturbance of mood and that all associated phenomena are secondary to this affective state (Lewis, 1934; Becker, 1977). While others e.g. Lewinsohn's (1974) give a contrasting view that depression is characterised as a result of conditioning and learning**,** and processes such as low rate of response contingent positive reinforcement.

Probably the most prominent psychological theory of depression is the one that sparked the cognitive features: Aaron Beck's cognitive theory of depression. According to this theory, the core of depression consists of a primary triad, that is, a persistent negative evaluation of self, the environment and the future. This primary triad causes negative emotions, which leads to a loss of positive motivation. This ends up in a paralysed will, avoidance, withdrawal and suicidal wishes (Beck & Alford, 2009).

More so, Beck (1989), quoted by Niven (2000, p.134) defined depression as 'paralysis of the will' (p. 130). In his theory of depression (Beck, 1967) explained the origin of depression as follows. Firstly, it was proposed that depression results from three forms of negative thinking especially when incorrect conceptions precede emotions. Consequently, he pointed out three such emotions as: (1) the self- 'I am a real failure' (2) the world- 'the things that happen around here are really awful' (3) the future-' life is always going to be boring.'

Secondly, was proposed that depression is associated with the following four incorrect assumptions; (1) selective abstraction or thinking negative about ones Behavior; (2) overgeneralization or believing that everything in one's life will go wrong due to previous incident; (3) over exaggeration of the significance of negative event while decreasing the importance of positive events; (4) personalization of negative events without justification.

The third proposition of Beck theory is from what he called a schema; which attempts to explain how individuals attribute erroneous meaning of their lived experiences, like the over exaggeration of their circumstances such as divorce or bereavement.

On the other hand, Seligman (1967, p.1-9), proposed the helplessness theory of depression. In his model which was a product of experimental observation in the conditioning of dogs, he proposed that "depressed people have learned helplessness from experiences and believed themselves unable to influence and control events" . In addition, it was proposed that people with pessimistic explanatory style, that is, people who see negative events as; permanent ("it will never change") personal ("it's my fault) and pervasive ("I can't do anything correctly") are most likely to suffer from learned helplessness and depression (Peterson and Seligman 1984, 347-374) It has been further argued that depressed people "have to be" helpless, by believing that whatever they do will be futile, and have no control over their environments (Peterson & Seligman, 1984).

Forms of Depression

According to current scholarly views (e.g., Niven, 2000; McKenzie, 2006), there are three basic groups of classifying depression which are:

(a) Mild/neurotic depression: this form is characterised by low mood swings assumed to originate from stressful events. In addition, McKenzie, (2006, p.37) state that dysthymia depression is reported to be a persistent mild depression, uniquely found to be associated with low self-esteem and indecision.

(b) Moderate depression: according to McKenzie (2006, p. 37), the individual enters a low mood which may become prolonged and persistent that he/she begins to develop physical symptoms and deterioration of health.

(c) Severe/psychotic depression: in this form, the individual's physical symptoms continue to deteriorate with associated delusions and hallucinations.

Similarly, in DSM- depression is divided into several subsets such as: dysthymia disorder, premenstrual dysphonic disorder, postpartum depression, and seasonal depression. It also includes mixed features - i.e., sadness with bouts of mania, or extreme highs. Melancholic features- i.e. lose of pleasure in almost all activities. Psychotic features- i.e. presence of delusions or hallucinations. However, the most commonly diagnosed form of depression is major depressive disorder, which is typically defined by symptoms such as "depressed mood, loss of interest, weight loss and loss of energy for at least two weeks continuously. On the other hand the DSM-5 published in 2013 proposed the following changes to the classification of depressive disorders:

- Persistent depressive disorder - this term is proposed to encompass both chronic major depressive disorder and dysthymia.
- Removal of the major depression bereavement exclusion - the diagnosis of major depression was excluded in people who had recently been bereaved. Having excluded this, more leeway is created for clinical judgement.
- A new category of mixed anxiety/depressive disorder.

However, there are certain medical conditions that can lead to a state of depression termed by the DSM-5 as "depressive disorder due to another medical condition". Of utmost interest here, is the idea that diabetes – which can result in weight gain-can induce clinical, psychiatric depression among the criteria of depressive disorders due to another medical condition (hereafter referred to as “depressive disorder”).

In this study, depression is considered as a mood disorder that causes a persistent feeling of sadness and loss of interest. It is also called major depression, major depressive disorder or clinical depression and itaffects how people feel, think and behave and can lead to a variety of emotional and physical problems.

Across the globe, researchers continue to research and debate the complex relationship between diabetes and depression. Recent researches have confirmed the bi-directional nature of this comorbid disorder (Lustman et al 2007; Ajilore et al 2007). For persons with diabetes (Type 1 or Type 2), the prevalence of depression is increased significantly, compared to those without diabetes (Gavard et al 1993; Knol et al 2006); those with diabetes are at least twice as likely to be depressed as those without diabetes (Anderson et al 2001). Similarly, depression has been noted to affect approximately one of every five patients with diabetes (Gavard et al., 1993). Conversely, , depression appears to significantly increase the likelihood of developing Type 2 diabetes due to lifestyle (Knol et al 2006; Kinder et al 2002; Carnethon et al 2003; Mezuk et al 2008).

On the other hand, there are many factors which have been identified to have influenced the diagnosis of depression in diabetes patients. Some of these include: cultural and economic factors, social and family influences, as well as psychological, Behavioral influences and the biological mechanisms, (Fisher & Chan 2008). Similarly, as the number of people with diabetes is expected to rapidly escalate – from 285 million in 2010 to 438 million in 2030 (Diabetes Atlas 2009) – it is imperative that research be expanded in order to better understand for whom, how, and why depression in diabetes is common, so that better prevention and treatment programs can be developed. Although, considerable research has been conducted with regards to this area, the evidence however, indicates contradictory results in those studies as described below.

2.1.2 Studies on Depression:

Gurpreet, Guat, Suthahar, Ambigga and Karuthan (2013), examined the prevalence and predictors of depression, anxiety and stress symptoms among diabetics in an urban primary care setting. A sample of (n=2,508) patients was randomly selected from 12 primary care government clinics in Klang, Malaysia. The item used for data collection is the Depression, Anxiety and Stress Scale (DASS) 21 questionnaires. The findings from the study showed that female gender, Asian Indians ethnicity, marital status (never married, divorced/widowed/separated), and less than 2 years duration of diabetes significantly predicted depression.

Agbir, Audu, Adebowale, & Goar (2010), examined the socio-demographic correlates of depression in a cross sectional studies among patients who attend the diabetes clinic of Jos University Teaching Hospital (JUTH) in Northern Nigeria. The findings showed that 31 out of the 160 diabetic subjects were identified as depressed using DSM-IV criteria giving a 1-year prevalence rate of 19.4%. The mean age for the population studied was 53.49 + 11.36 years. Majority of the respondents were aged between 40-50 years representing 58.8% of the study population and (66 (41.3%) females and 94 (58.8%) males).

Evidence from the findings, showed that 21 (67.7%) of the 31 depressed subjects were rated as having minor depression and 10 (32.5%) as moderate to severe depression using the Hamilton Depression Rating Scale (HDRS). Furthermore, significant association was found between depression and gender with a female and male ratio of 3.1 and was also significantly associated with unmarried patients and those who had poor relationships with their partners. The authors reported no significant association between depression and educational attainment (df =1, $x2$ =1.229, P=0.268), employment status (df=1, $x2$ =0.04, P=0.84), and the respondents age groups (df=l, $x2$ =1.530, P=0.216), household composition (p=0.77) and monthly income (p=0.110).

Nitin, Bhaskaran, Raghavendra, Shashidhar, and Maria (2013) examined the proportion of depression and its determinants among type 2 diabetes mellitus patients in various tertiary care hospitals in Mangalore city of South India. A sample of (n=230) T2DM Patients filled the 9-item PRIME-MD Patient Health Questionnaire; 119 (51.7%) were males. Among the participants, 71 (30.9%) met the criteria for moderate depression, 33 (14.3%) for severe depression, and the remaining 126 (54.8%) had no clinically significant depression.

In addition, among the risk factors, depression was found to be significantly associated with older age, female gender, low socio-economic status, unskilled and retired employment status.

Fareeha, Shaheen, Zafar, Asher, Abdul, Samad and Akhtar (2010) used cross sectional study to examine the prevalence of depressive symptoms among subjects with high-risk of diabetes in an urban city of Pakistan. A sample of (n=1,246) subjects filled the Montgomery Asberg Depression Rating Scale (MADRS), and 853 (68.4%) were males and393 (31.5%) were females. The result showed that depressive symptoms were present in 7.4% of the subjects at a rating of > 13 on the MADRS. Mean age of all the subjects was 42 ± 9.4 years. In addition, the prevalence of depression was significantly higher in subjects with newly diagnosed diabetes. Also, females were found to be more depressed than males (15.5% *vs* 3.6%; $p< 0.001$).

Yoshiko, Hitoshi, Tetsuya, Shin-Ichi and Masahiro (1997), examined the impact of socio-demographic and diabetes- related characteristics on depressive state in a cross sectional studies among non-insulin-dependent diabetic patients. A sample of (n=151) patients, 93 males and 58 females were taken and the items used for data collection included: the Eysenck Personality Questionnaire (EPQ), Zung Self-Rating Depression Scale (SDS) and Social Support Questionnaire (SSQ). The findings of the study showed that depressive symptoms in the patients were correlated with poor social support and low economic status. However, depressive symptoms did not correlate with age, gender, education or duration of diabetes.

Poulsen & Pachana (2012), examined the differences in depression, anxiety and diabetes-related emotional distress between middle-aged and older adults with diabetes and non-diabetes. With a total sample of (n=224). The items used are the Center for Epidemiological Studies Depression Scale (CES-D), General Anxiety Inventory (GAI) and Problem Areas in Diabetes Scale (PAID). The findings of the study showed that older adults with diabetes have significantly higher level of depression and comparable levels of anxiety with older adults without diabetes. In addition, older adults with diabetes had significantly lower levels of depression, anxiety and diabetes related distress than middle-aged adults with diabetes. Similarly diabetes is associated with high rates of depression and anxiety, with middle-aged adults being more adversely affected than older adults

Zhao, Chen, Lin & Sigal (2006), used a cross sectional study to examine the association between diabetes and the prevalence of depression and their differences by sex and age groups. A total sample of (n=530) participants, aged 20-64 years filled the short form of the Composite International Diagnostic Interview (CIDI-SF. Evidence from the finding of the study showed that the prevalence of diabetes was much higher in people aged 40-64 years than in people aged 20-39 years (men: 4.7% vs. 0.5%; women: 3.5% vs. 0.8%, respectively) In addition, people aged 20-39 years had a slightly higher prevalence of depression than those aged 40-64 years (men: 3.1% vs. 2.9%, women: 6.6% vs. 5.4%, respectively. However, diabetes was significantly associated with depression in women aged 20-39 years, but not in women aged 40-64 years. Similarly, the association was not significant in both age groups in men, but the authors reported that it is likely to be stronger in the younger age group.

Hu, Amoako, Gruber and Rossen (2007), examined the relationships of gender, race, comorbid conditions symptom distress, and functional status with depression in a sample of (n=55) older adults with diabetes, 14 Males and 41 Females completed the Symptom Distress Scale (SDS), Instrumental Activities of Daily Living (IADL) Scale and Geriatric Depression Scale- Short from (GDS). The results of the study showed that gender and symptom distress were the strongest predictors of depression; accounting for 53% of the variance in depression. In addition, male and white participants had substantially higher depression. However, the findings of Hu et al., (2007) is in conflict with the study of (Blazer and colleagues 2002; and Katon et al., 2004) which opines that being female and being black are closely associated with depression.

Stankovie, Jasovic- Gasic & Zamaklar (2011), examined the psycho-social and clinical variables associated with depression among patients with type 2 diabetes. A total sample of (n=90) participants, age 30-65 years filled questionnaires of Patients Health Questionnaire (PHQ), Beck Depression Inventory (BDI), The Structured Interview MINI, The Scaling of Life Events (SLE) and the Problem Areas in

Diabetes (PAID). Results from the study showed statistically significant higher rates of psychiatric heredity, higher level of diabetes related distress and a greater number of life events in depressed patients. There were significant positive correlations between BDI somatic sub-score. In addition, the findings showed life event to be statistically significant predictors of depression.

Fisher, Chesla, Mullan, Skaff and Kanter (2001), examined the contributors to depression in a cross sectional studies in Latino and European- American(EA) patients with type 2 diabetes; (n=72) Latino and (n=113) European –American. The items used include: Epidemiological Studies- Depression Scale (CES-D) and Anxiety (Symptom Checklist SCL-90), Quality of Life Questionnaire, family stress and financial stress items. Evidence from the findings showed that 11 predictors accounted for 50% of the variance in CES-D depression score and similarly, the 11 predictors accounted for 43 and 46% of the variance in SCL-90 anxiety scores for both Latinos and EAs.

Furthermore, for both groups, education, functional impact, and financial stress significantly and independently predicted depression. However, poor spouse conflict resolution was significantly related to depression among EAs but not among Latinos. The findings also showed no significant differences in rates of likely depression between males and females both across and within ethnic groups.

Sacco, Wells, Vaughan, Friedman, Perez and Matthew (2005), used a cross sectional study to examine depression in adults with type 2 diabetes, the role of adherence, body mass-index (BMI), and self-efficacy. A total sample of (n=56) participants, 55% females and 45% males was taken. Items used include: the Diabetes Self- Care Activities Questionnaire (SDSCA), Multidimensional Diabetes Questionnaire, Self-Efficacy Subscale and the Patient Health Questionnaire. Evidence from the findings of the study showed that self-efficacy correlated with depression. In addition, self-efficacy remained a significant predictor of depression. The findings also revealed that less adherence patients, had lower self-efficacy, and were more depressed.

James, Morakinyo, Eze, Lawani and Omoarebe (2010), used a cross sectional studies to examine the prevalence of depression and its relationship with socio-demographic and clinical correlate among patients with diabetes mellitus attending an out-patients clinic at the Endocrinology clinic of the University of Benin Teaching Hospital (UBTH), Benin City, Nigeria. A total sample of (n=200) patients participated; 92 males and 108 females. Items used include: Schedule for Clinical Assessments in Neuropsychiatry (SCAN) and Beck Depression Inventory BDI. Evidence from the findings of the study showed that major depression disorder (MDD) was diagnosed in 30% of patients. Furthermore, having a lower income and more children were significantly correlated with higher depression symptoms on the BDI.

Khuwaja, Lalani, Dhanani, Azam, Rafique and White (2010), used a cross sectional study to examine the associated factors of depression and anxiety among out-patients with type 2 diabetes in multi-centre clinics in Karachi, Pakistan. A total sample of (n=889) patients participated; 378 males and 511 females. Thetfilled the hospital anxiety and depression scale (HADS) and results from the findings of the study showed that 43.5% were positive for depression. In addition, factors found to be significantly associated with depression were: being female, being of older age, not living with spouse, having schooling for more than 5 years and disease duration more than 5 years.

Aziz, Zahra, Mohammaderza and Mazhgan (2012) used a cross sectional study and examined the frequency and severity of depression in diabetes patients referred to the diabetes centre of Zabol. A total sample of (N=100) participated; 48 males and 52 females filled the Beck Depression Inventory (BDI). Evidence from the findings of the study showed high prevalence of depressive symptoms among diabetic patients (type I and II). In addition, the findings revealed that 23% of males had mild depression and 12% had moderate. Similarly, majority of females 18% had moderate depression and 10% had severe depression. However, the findings showed no association between depression and age but a statistically significant association was reported between depression and duration of diabetes.

Collins, Corcorant and Perry (2008) used a cross sectional study to examine the prevalence and major determinants of depression and anxiety symptoms in patients with type I and II diabetes. A total sample of N=1456 participated; n=842 males and n=612 females filled the questionnaire of Hospital Anxiety and Depression Scale.

Evidence from the findings of the study showed high levels of depressive symptom accounting for 32.0%. In addition, higher socio-economic status and older age were protective factors for lower depression scores. The findings also showed that marital status, younger age and female gender, type of diabetes were not significantly associated with higher depression scores, but lower educational attainment was associated with a higher depression score.

Agbir, Adebowale, Audu, Goar, Puepet and Osika (2010) conductedcross sectional study to examine clinical correlates of depression among diabetics at the Jos University Teaching Hospital (JUTH), Nigeria. A sample of (N=160; n=66 females and n=94 male), the age distribution shows majority (68.1%) were aged between 20-59 year with mean of 53.49+11.36. Items used include: the Structural Clinical Interview for DSM-IV (SCID) Axis; 1 disorder and the Hamilton Depression Rating Scale (HDRS). Evidence from the findings of the study showed that 31 subjects were identified as depressed using DSM-IV criteriaIn addition the findings showed that Depression was significantly associated with gender (p=0.001) with a female to male ratio of 3.1 and long duration of diabetes (p=0.002), but no statistically association between the age group and the diagnosis of depression.

Francisco, Zenteno and Cardiel (2001) examined the risk fact associated with depression in patients with type 2 Diabetes Mellitus in a cross sectional study at the department of Neurology and Psychiatry of the Instituto Nacional de Ciencias y Nutticion Salvador Zubiran in Mexico City. A total sample of N=189 participated; n=80 males and n=109 females, filled the questionnaire of Beck Depression Inventory Scale (BDI). Evidence from the findings of the study showed that the prevalence of depression was 39% (in 74 patients).In addition, the results of the study showed that occupation, being a housewife, widowed and divorced and gender, being a woman was associated with the presence of depression.

Stone and Bluhm (1984), examined demographic characteristics; marital and family relationships, knowledge and management of disease, number of severity of complications, self-esteem, locus of control, and life satisfaction as correlates of depression among long term Insulin-Dependent Diabetics. A total sample of (N=181) patients who participated, filled the questionnaire of Beck Depression

Inventory (BDI), Coopersmith Self Esteem Inventory, Rotter's Revised Internal-External Control Scale and Neugarten's Life Satisfaction. Evidence from the findings of the study showed that the variance in depression is accounted by self-esteem, and life satisfaction. In addition, the study found a significant correlates of depression with demographic variables, maritial relationship variables, and three measures of psychological well-being (self-esteem, locus of control and life satisfaction).

Cherrington, Wallston and Rothman (2010) examined the relationship between diabetes self-efficacy, depressive symptoms, and glycemic control among men and women with type 2 diabetes in two primary care clinics, (The Vanderbilt University Medical Center and University of North Carolina School of Medicine). A total sample of N=162 patients participated, n=98 females and n=64 males filled the questionnaires of the Center of Epidemiological Studies-Depression Scale (CES-D) and Perceived Diabetes Self-Management Scale (PDSMS). The findings showed that male gender significant correlate depressive symptoms and diabetes self-efficacy, but the correlation for female was not statistically significant.

Sacco and Bykowski (2010) also conducted a cross sectional study to examine the role of self-efficacy on depression and haemoglobin A1c in type 1 and type 2 diabetes at the University of South Florida Medical Clinic. A total sample of (N=124) patients with type 1 (n=32) and type 2 (n=92), filled the Nine Symptom Depression Checklist (PHQ-9) and Multidimensional Diabetes Questionnaire Self – efficacy sub-scale (MDQ).The findings of the study showed that depression was significantly correlated with self-efficacy among type 1 ($r= -.42$, $p<.05$) but not among type 2 diabetic patients.

Kaholokula, Haynes, Grandinetti and Chang (2003) used a cross sectional data from the Native Hawaiian Health Research (NHHR) to examine the Biological, Psychosocial and Socio-demographic variables associated with Depressive Symptoms in Persons with Type 2 diabetes. A total sample of (N=146), n=67 males and n=79 females age 26-89. Item used include: Center of Epidemiological Studies-Depression Scale (CES-D), SF-36 Health Survey and Lubben Social Network Scale (LSNS). The finding of the study showed that the strength of the relationship between depressive symptoms and health related quality of life varied as a function of sex, education, marital status, and social support. However, the strength of the relationship between depressive symptoms and health-related quality of life was stronger for females than for males; stronger for people who were not high school graduates than for those with a high school degree or higher; stronger for people who were either separated, divorced, or widowed than for married and never-married people; and stronger for people with higher levels of social support than for those with low levels of social support.

Galveia, Cruz and Deep (2012) examined socio-demographic and clinical factors associated with psychological and Behavioral functioning associated with the problem of non-treatment adherence and/or presence of stress, anxiety and depression, in diabetics living in Faro, Portugal. A total sample of (N=252), ages between 19 and 89 yeasr filled the questionnaire of Diabetes Self-Care Activities Scale, Depression Anxiety Stress Scale (DASS). Evidence from the findings of the study showed that 22.8% (n=77) had significant levels of depression. In addition, the findings showed that females have a higher prevalence of depression as compared to males. Similarly, variables such as higher age, low educational levels were related to have a negative impact on the prevalence of depression.

Faisal, Asgheen, Hydrie, Fawwad, Basit, Shera and Hussain (2010) used a cross sectional study to examine the prevalence of depressive symptoms among subjects with high-risk of diabetes in an urban city of Pakistan. A total sample of (N=1,246) patients, n=853; (68.4%) males and n=393 (31.5%) females filled the questionnaire with Montgomery Asberg Depression Rating Scale (MADRS). Evidence from the findings of the study revealed that 13% prevalence of depression symptoms. Similarly, in the gender distribution, females were more depressed as compared to males (15.5% vs 3.6%; $p<0.005$). In addition, the findings of the study showed that being socio-economically dependent (non-earners and not included as income generating members of the family) were significant independent risk indictors for depression.

Nasser, Habib, Hasan and Khalil (2009) used a cross sectional retrospective clinical study to examine the prevalence of depression among diabetics, and the relationship between depression and socio-demographic factors, metabolic control and diabetes complications in four primary health care centers. A total sample of (N=264), patients filled the Beck Depression Inventory (BDI). The findings from the study showed that the prevalence of depression was (33.3%). In addition the study found a statistical significant association between high score (≥ 16) and gender. However, no significant association between BDI score and duration of diabetes, and other socio-demographic factors (e.g. Age, Marital status, and educational level).

Jianmin, Ren, Cheng, Tang, Dong, Hou, Sun, and Chen (2004) examined depressive symptoms and risk factors in Chinese Persons with type 2 diabetes. A total sample of (N=222) patients, 115 males and 107 females filled the questionnaire of the Zung Self-rating Depression Scale (ZSDS). Evidence from the findings of the study showed that 51 (23.0%) of the patients being categorized as having depressive symptoms. In addition the findings showed depressive symptoms in females to be higher than in males (29.0% vs 17.6%). However, the findings indicated that depressive symptoms increased with increase of diabetes duration.

Kyrios, Nankervis, Raddy and Sorbello (2006) examined the interrelations between depression, diabetes health outcome, Quality of life, treatment compliance, and psychological factors (such as hopelessness, self-efficacy, and self-esteem) in Type 1 Diabetes patients. A total sample of (N=50) out-patients, 20 males and 30 female filled the questionnaire of Self Care Activities for Diabetes (SSCAD), Medical Outcome Study Short-Form General Health Survey (MOS-SF36), The Beck Depression Inventory (BDI), the Adult Dispositional Hope Scale (HS), Self-efficacy Scale (SES) and the Tennessee Self- Concept Scale (TSCS). Evidence from the findings of the study showed that depression exhibited significant moderate high magnitude correlations with overall self–care, physical self-concept, hopelessness, self-efficacy and quality of life. In addition, the findings showed no significant gender difference.

Groot, Doyle, Hockman, Wheeler, Pinkerman, Shubrook, Gotfried and Schwartz (2007) conducted a cross sectional study to examine depression among type 2 diabetes. A total sample of (N=201), patients filled the questionnaire of Beck Depression Inventory (BDI-II). Evidence from the findings of the study indicated that 31% (n=61) of the patients reported clinically significant levels of depressive symptoms. Furthermore, the findings showed that younger age, unemployment and lack of home ownership significantly predicted depression status.

Raval, Dhanaraj, Bhansali, Grover and Tiwari (2010) examined the prevalence and determinants of depression in patients with established type 2 diabetes (T2DM) attending a tertiary care hospital in North India. A total sample of (N=300), 147 (49%) males and 153 (51%) females filled the Nine items (PHQ-9). The findings from the study showed that 68(23%) met the criteria for severe depression. In addition, the results from the study showed that depression was strongly associated with age >54 years (OR1.26, 95% CI 1.02-1.67; P<0.05). Similarly, depression was most strongly associated with monthly income. However, the likelihood of depression was not significant with gender, rural vs urban residence, education and duration of diabetes.

El- Shafie, El-Saghier and Ramadan (2011) carried out cross sectional study to examine socio-demographic characteristics of type 2 diabetes and their relationship with depression among patients aged from 40 to 60 years old attending diabetes clinics at the Al-Zahraa hospital. A total sample of (N=125) participated; more than half of the participants were females (58.4%) and they were assessed using the MADRS; a screening tool for depression level evaluation. The findings from the study showed that more than two third (74.4%) of patients were depressed; (24.8% mild, 37.6% moderate and 12% severally depressed. In addition, the findings indicated that depression was strongly associated with age and gender. However, severe depression was significantly higher in females than males (86.7% vs. 13.3%; p= 0.001). Similarly, the study found no significant difference between marital status, social class and depression.

Connell, Davis, Gallant and Shape (1994) examined the impact of social support, cognitive variables, and threat on depression among adults with Diabetes. A total sample of N=362 filled the questionnaire comprised of Medical Outcome Study (MOS), Short-Form General Health Survey, Self-efficacy scale, Outcome experiences, the Social Provision Scale (SPS) Diabetes-specific support received and Center of Epidemiological Studies- Depression Scale (CES-D. The findings from the study showed that self-efficacy and diabetes-specific support were not significantly associated with depression. Similarly, gender did not significantly contribute in the prediction of the any of the model component. Evidence from the study further showed that married adults reported lower levels of diabetes-specific social support than unmarried adults. However, the study indicated that the perceived availability of social support is associated with depression.

Carrillo, Pena, Duran-Munoz, Flores and Salmeron (2009) used a cross sectional study to examine the relationship between social support and the physical and mental wellbeing of older Mexican adults with diabetes from the Instituto Mexicano del Seguro Social (IMSS). A random sample of (N=705, n=135 males and n=431 females) diabetic patients filled the questionnaire of Health Related Quality of Life (HROL), Geriatric Depression Scale (GDS) and the MOS Social Support Survey (MOS-SSS). Evidence from the findings of the study showed that 40% of diabetic patients suffer depressive symptoms (GDS $\geq$ 11), which were associated with being female, individuals with less education, younger patients, and recently diagnosed with diabetes. In addition, the findings showed that patients with more social support scored higher on the quality of life with a mean of 62.6, compared to a mean of those with low social support. Similar difference occurs in the (GDS) score; those with high social support have a mean score of 9.3' while those with low social support had a mean of 11.6. However, the more social support a patient reported, the less depressive distress. But no significant differences were found between social support and health variables scores, duration, or socio-demographics variables.

Osborn and Egede (2012), used a cross sectional study to examine the role of social support as a mediator of the relationship between depressive symptoms and medication non-adherence in type 2 diabetes at the internal medicine clinic of an academic medical center in the South-eastern of United State. A sample of N=139 patients, aged 18 and above filled the questionnaire of the Patients Health Questionnaire (PHQ-9) and Medical Outcome Study (MOS) Social Support Survey. Evidence from the findings of the study showed that 23.8% were categorized as having mild depressive symptoms and 14.3% as having major depressive symptoms. In addition, the findings showed that more depressed symptoms were associated with less social support.

Kanbara, et al., (2008) examined social support, self-efficacy and psychological stress response among out-patients with diabetes in Yogyakarta, Indonesia. A sample of (N=125) patients, aged 40 and above filled the questionnaire of the social support, self-efficacy and stress response scale with three factors (depression, anxiety, irritability, anger and hopelessness). The findings from the study showed that self-efficacy reduced stress response in terms of a reduction in depression of the patients.

Discussions of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences being mostly influential in the prediction of patient's depression.

The literatures examined provided evidence that female diabetic patients reported more frequency of depressive symptoms and higher scores of depression than their male counterparts. Similarly, studies reporting the differences between gender and depression in people with diabetes demonstrated varying levels. For instance, (Yoshiko, et al., 1997 Fisher, et al., 2001; Collins, Corcorant and Perry 2008; Kyrios, et al., 2006; Raval, et al., 2010; Connell, et al., 1994) reported non-significant differences in the rates of depression between males and females. In contrast to the studies of (Gurpreet, et al., 2013; Agbir, et al., 2010; Fareeha, et al., 2010; Zhao, etal., 2006; Khuwaja, et al., 2010; Francisco, Zenteno and Cardiel 2001; Kaholokula, etal., 2003; Galveia, Cruz and Deep 2012; Faisal, et al.,2010; Jianmin, et al., 2004; El- Shafie, El-Saghier and Ramadan 2011; Carrillo, et al., 2009) which showed that female patients were more depressed than their male counteparts. Conversely, Hu, et al., (2007) reported that male participants had substantially higher depression than female.

In terms of ethnicity and type of diabetes, there is paucity of studies that compared the differences between ethnicity, type of diabetes and depression. One of the few studies e.g. Gurpreet (2013), found that ethnicity was significantly associated with depression. More so, Sacco and Bykowski (2010) reported a significant difference by type of diabetes and depression, that is, being type 1 was more associated with higher scores of depression than type 2. In contrast, Collins, Corcorant and Perry (2008), reported no significant difference between types of diabetes with depression scores.

Based on the reviewed literatures, gender indicated mostly influential in the prediction of depression than ethnicity and types of diabetes. In addition, it is likely that gender pulling more of the significant difference was due to lack of the studies that did compare the differences of ethnicity and type diabetes with depression. However, this is a main focus of this study.

2.2 Anxiety

2.2.1 Theoretical Framework

According to Barlow (2000) anxiety is "a future-oriented mood state in which one is ready or prepared to attempt to cope with upcoming negative events". Anxiety affects three components: (Behavioral, Emotional and Cognitive). The behavioral effect of anxiety involves withdrawal from situations which have provoked anxiety in the past. Similarly, anxiety can also be experienced in ways which include changes in sleeping patterns, nervous habits, and increased motor tension like foot tapping (Barker, 2003). The emotional effects of anxiety is the "feelings of apprehension or dread, trouble concentrating, feeling tense or jumpy, anticipating the worst, irritability, restlessness, watching (and waiting) for signs (and occurrences) of danger, and, feeling like your mind's gone blank" (Smith, 2008). The cognitive effects of anxiety include thoughts about suspected dangers, such as fear of dying due to diabetes mellitus. In other words anxious diabetes patients may feel an intense fear when he/she thinks of dying, or think of it more often than normal, or can not get it out of their mind.

Anxiety is one of the most prevalent psychological disorders with an estimated general population prevalence ranging from 12% to 21%. Anxiety disorders typically present with core features of anxious cognitions, somatic symptoms and Behavioral disturbance, with different subtypes of anxiety possessing distinct characteristics (Wittchen and Fehm 2001). According to (Kessler et al., 2010), anxiety disorder typically has a chronic and recurrent life course, and occurs early in adulthood. The main anxiety disorders associated with medical illness are the generalized anxiety disorder (GAD), (Fava et al., 2010).

There is a well-documented association between various chronic diseases with anxiety (Katon et al., 2007; Gariepy et al., 2010). More so, literatures have shown that anxiety is an important comorbidity with diabetes. Furthermore, in people with diabetes, comorbidity anxiety disorders and elevated anxiety symptoms have been shown to be associated with increases in diabetes symptoms (Lustman et al., 1998).

However, available evidence from those studies indicated conflicting findings in terms of the association between diabetes with anxiety and other related factors. For instance, Bener et al., 2011; Grigsty et al., 2002) found that the higher anxiety reported among females patients in comparison to their males counterpart were not significantly associated between type 1 and type 2. While on the other (Koulour et al., 2009; Nikibakht 2009) reported that the higher anxiety among female diabetic patients were significantly associated with type 2 patients. Therefore, this dissimilarity in terms of the association between anxiety, gender and type of diabetes warrant further studies. However, the reviewed studies on anxiety are described below.

2.2.2 Studies on Anxiety

Kohen, Burgess, Catalan and Lant (1998) examined the role of anxiety and depression in the reporting of quality of life among patients with diabetes mellitus. A total sample of (N=100) participants filled the questionnaire of The Hospital Anxiety and Depression Scale (HADS), Medical Outcomes Study (MOS) Short Form Health Survey. The findings from the study showed anxiety to be more common in the IDDM group. However, no difference was revealed between the groups in terms of the mean score on the HAD anxiety scale (NIDDM mean = 7.8, SD =4.7, IDDM mean = 9.1, SD = 4.2; t = 1.36, df = 98). In addition, further analysis from the study showed significant correlation between anxiety with self-reported quality of life. This implies that, patients who scored high anxiety tends to report poorer quality of life than patients with normal mood state.

Fang, Wu, Huang, Liang, Wang, Lee and Tung (2011) used a cross sectional study to examine the relationship between self-care Behavior, diabetes educations difficulties, depression and anxiety among patients with type 2 diabetes in Taiwan. A sample of (N=312) patients filled the Beck Depression Inventory (BD1), Beck anxiety Inventory (BAI), and the Diabetes Self-care Activities (SDSCA). The findings of the study indicated the rates for anxiety (20.5%) among type 2 diabetes patients. In addition, the result of the study showed a positive correlation of anxiety with age ($r=0.15$, $p<0.01$).

Grigsby, Anderson, Freedland, Clouse and Lustman (2002) carried out a systematic review of literatures on the prevalence of anxiety in adults with diabetes. The findings of the review showed that the prevalence of elevated symptoms of anxiety is significantly higher in women compared to men (55.3% of 418 women vs. 32.9% of 325 men x=36.8, p <. 0001). However, no differences occurred in the prevalence of elevated anxiety symptoms in subjects with Type 1 vs. Type 2 diabetes (41.3% of 283 with Type 1 vs. 42.2% of 689 with Type 2, x= 0. 07, P = .80).

Koulouri, Sotiropoulou, Makrinika, Lahana and Gourni (2009) examined anxiety and depression in patients with type 2 diabetes mellitus, its relation on sex and body mass index. A total sample of (N=310) patients, 44% (n=136) males and 56% (n=174) females completed the Hospital, Anxiety and Depression Scale (HADS). The findings from the study showed that anxiety symptoms is strongly related to the gender of individuals with type 2 diabetes mellitus. That is, females had more anxiety symptoms three times higher in comparison to males, (62% (n=136) of females to 21% (n=29) of males (p< 0.001).

Atasoy, Anaforoglu, Algun and Kutanis (2013) examined depression, anxiety and quality of life among Turkish adult patients with type 1 diabetes mellitus. A sample of (N=58) patients filled the Short Form-36 Health Survey Questionnaire, Beck Depression Inventory (BDI), and the State-Trait Anxiety Inventory (STAI-1 &2). The results from the study indicated that overall patients had lower scores of quality of Life, higher scores of depression and anxiety. However, the authors found no correlation between duration of illness, quality of life, depression and anxiety.

Peyrot and Robin (1997) examined levels of depression and anxiety symptoms among adults with diabetes and identify factors associated with increased risk. A total sample of (N=246) patients, completed the questionnaire of the Center for Epidemiological Studies Depression (CES-D) and the Zung Self Rating Anxiety (ZSRA). The findings from the study showed a high prevalence of anxiety (49.2%). However, further analysis from the study showed that being female, less educated, aged 40-49 years is associated with higher likelihood of being anxious.

Sato, Morimoto, Tsutsu, Nakakado, Kinugawa and Nakamura (2002) examined the background factors correlated with the psychological feature of 254 out-patients with type 2 diabetes mellitus in Japan. Items filled include the State-Traits Anxiety Inventory (STAI) and the Self –rating Depression Scale (SDS). The findings of the study showed that socio-demographic factors, a younger age (40-49) correlated significantly with anxiety, and females showed a correlation with anxiety.

Nikibakht, Moayedi, Zare, Mahboobi, Banaei, Khorgoel and Jahanshahi (2009) examined anxiety and depression among diabetic patients in Bandarabbas, Southern Iran. A total sample of (N=100) patients, 21 males and 79 females filled the questionnaire of the Beck Depression Inventory (BDI), and the Beck Anxiety Inventory (BAI). The findings from the study showed the prevalence of 67% anxiety. However, the authors reported that anxiety is more common among female patients, in those with type 2 diabetes.

Rane, Wajngot, Wandell and Gafvels (2011) examined psychosocial problems in patients with newly diagnosed diabetes, numbers and characteristic. A total sample of (N=106) patients, (72 males and 34 females filled the questionnaire of the Hospital Anxiety and Depression Scale (HADS), Sense of Coherence (SOC) Scale, General Coping Questionnaire 9GCQ) The findings from the study showed significant association with risk of having psychosocial problems and having strained personal finances and low social support. The authors reported no statistically significant differences between psychosocial problem, gender and age. In addition, further analysis from the study showed significant relationship between anxiety and coping strategies; that is, patients who were anxious reported using negative coping strategies more often.

Bener, Al-Hamaq and Dafeeah (2011) examined the relationship between high depression, anxiety and stress symptoms in Diabetes Mellitus (DM) patients in comparison with control group. A total sample of (N=889) diabetic patients and (N=889) healthy subject filled the questionnaire of the Depression Anxiety Stress Scales (DASS) -21, and the Hospital Anxiety and Depression Scales (HADS). The findings from the study showed significant larger proportion of DM subjects with severe anxiety scores (35.3% vs. 16.3%; $p < 0.001$). Similarly, diabetic females had higher anxiety (70.1% vs 61.6%) scores than males.

Paddison, et al., (2011) examined factors predicting anxiety among people who attend primary case-based diabetes screening from 10 primary care practices. A total sample of (N= 3,240) patients, completed the Hospital Anxiety and Depression Scale

(HADS). The results from the study showed that being younger participants, females correlated with higher score on the (HADS) anxiety.

Paschalides, et al., (2004) used a cross sectional study to examine the associations of anxiety, depression and personal illness representations with glycaemic control and health- related quality of life in patients with type 2 diabetes Mellitus. A total sample of (N=219) patients, completed the illness perception questionnaire (IPQ), the Well-Being Scale (WBQ) and the Short Form 36 Health Survey Questionnaire (SF-36). The findings from the study revealed that high anxiety scores are associated with greater anticipated duration of illness. Furthermore, the authors reported that symptoms of anxiety associates with impaired health-related quality of life.

Szmedra and Sharma (2011) examined anxiety and depression among diabetes patients in Samoa; using health Behavior instruments to assess the linkage between mental health and chronic illness. A total sample of (N=214) participants, 109 males and 105 females completed the EQ-5D and the Health Promoting Lifestyle Profile (HPLP). The findings from the study indicated that only wages/day, duration of being diabetic were statistically significant. However, the authors reported that each positively associated with anxiety in the sampled population.

Discussion of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences with which were mostly influential in the prediction of patient’s anxiety.

The studies of (Bener et al., 2011; Grigsty et al., 2002; Koulour et al., 2009; Peyrot and Robin, 1997; Sato et al, 2002; Paddison et al., 2011; Nikibakht, et al., (2009) reported significant difference between gender and anxiety with more anxiety symptom higher in females compare to males. In contrast, Sato, et al., (2002) reported that males were more anxious than their females. More so, Rane, et al., (2011) reported no significant difference between gender and anxiety. Similarly, (Koulour et al., 2009; Nikibakht 2009) found that the higher anxiety reported among female significantly associated with type 2 patients.

Furthermore, (Kohen, et al., 1998; Grigsby, et al., 2002) reported no significant difference between anxiety and type of diabetes. Equally, the findings of (Fang, et al., 2011; Nikibakht, et al., 2009) indicated higher rates of anxiety among type 2 diabetes patients than type 1. On the other hand, the reviewed literature clearly showed that being female with type 2 diabetes is mostly influential in the higher rate of anxiety. However, this current study intends to examine which of the factors differ with diabetic patients in the Nigeria context.

2.3. Stress

2.3.1 Theoretical Framework

The term "stress" as it relates to the human condition has been in scientific literature since 1930s and in psychological literature since late 1960s, as psychologists became interested in applying the concept of stress to psychological experiences (Masuda and Holmes (1967). Although the stress concept in science stems largely from the work of endocrinologist, Hans Selye, who viewed stress as a response to noxious stimuli or environmental stressors and defined it as the "non-specific response of the body to noxious stimuli" (Selye 1956, p.12). Thus, Selye defined stress as a response, and this became the dependent variables in stress research.

Selye's work focused on describing and explaining a physiological response pattern known as the General Adaptation Syndrome (GAS) model of stress that was focused on retaining or attaining homeostasis, which refers to the stability of physiological systems that maintain life (e.g., body temperature, heart rate, glucose levels). However General Adaptation Syndrome (GAS) proceeds in three well-defined stages:

1.) The alarm reaction stage: comprises an initial shock phase and a subsequent counter-shock phase. The shock phase exhibits autonomic excitability, an increased adrenaline discharge, and gastro-intestinal ulcerations. It marks the initial operation of defensive processes and is characterized by increased adrenocortical activity.

2.) If noxious stimulation continues, the organism enters the stage of resistance. In this stage, the symptoms of the alarm reaction disappear, which seemingly indicates the organism's adaptation to the stressor. However, while resistance to the noxious stimulation increases, resistance to other kinds of stressors decreases at the same time.

3.) If the aversive stimulation persists, resistance gives way to the stage of exhaustion. The organism’s capability of adapting to the stressors is exhausted, the symptoms of stage (one) reappear, but resistance is no longer possible. Irreversible tissue damages appear, and if the stimulation persists, the organism dies. Similarly, Neil (2000), beliefs that since at that terminal stage, the body's first mandate is on resistance to stress; hence its resistance to infection is weakened. In addition to the GAS model of stress, Selye (1973, Pp.692-699) also identified two types of stress: the positive, pleasant or eustress, and the negative or unpleasant stress.

However, Selye's pioneering work on stress was not without controversy. For example, Caplan (1981), defined stress as a "condition in which there is a discrepancy between the demands of an organism and the organism's capability to respond, the consequences of which will be detrimental to the organism's future in respect to conditions essential to well-being" (p.414). Accordingly, Caplan (1981) proposed a model of stress, which he expressed in four phases: first, he advocated that the individual should adopt a positive Behavior, which will change either the stressful situation or environment, or a Behavioral change that will enable the individual to escape from the situation by denial. In this phase, measurement of stress can either be from the point of the stressful events or from the side of the individual.

In phase two, he advocated a learning Behavior, which will enable the individual to acquire a positive attitude of action to change the stressful environment and the aftermath. In phase three, he advocated for an intra-psychic Behavior that will enable the individual to withstand dysphonic and emotional arousal. In phase four, he advocated for intra-psychic Behavior that will enable the individual to come to terms with the event and its consequences. However, Lazarus (1991) rejected Selye's (1950), explanation of psychological stress by adrenal effect. In his observation, he found that patients showed normal adrenal cortical conditions, as long as they are in an unconscious state, and unaware of a dangerous situation, that Selye’s proposed GAS model could not take place. On the contrary, Lazarus (1966; 1991) proposed a cognitive model in two sections: (1) appraisal of stress and (2) coping of stress. The appraisal of stress section consists of two groups: The primary appraisal, at which the individual weighs the threat and his or her safety and the secondary appraisal at which the individual considers his options of escape from the stressful event or threat in the light of his experiences.

The coping mechanism of stress section consists of two groups; as identified by Lazarus in 1966: Direct action and palliative. In 1984, Lazarus and Folkman changed the names of these two forms to problem-focused coping and emotion-focused coping, respectively. The direct action (i.e. problem focused coping) enables the individual to confront the stressful situation directly. For example, by working hard through self-care management to balance glucose level, or seeking for social support if it is a financial issue. In any case, the individual attacks the stressful situation directly. The second group of coping is the palliative action (i.e. emotion focused coping). The palliative coping of stress demands that the individual develops an internal mechanism, which will enable him or her to live a normal life even though the stressors are there. These tactics include such efforts as distancing, avoiding, selective attention, blaming, minimizing, wishful thinking, venting emotions, seeking social support and mediating. However, evidence from the literature show that higher level of stress correlated with people who did not cope well with their diabetes (McMurry, 1992).Generally, people who rely more on approach coping and less on avoidance coping tend to adapt better to stressors and experience better psychological outcomes, such as reduced depressive symptoms (Endler & Parker, 1990; Mitchell, Cronkite, & Moos, 1983).

Nevertheless as hypothesized by Lazarus (1991), an active coping strategy which is refers to the ways of coping that focus on trying to control diabetes or to function despite diabetes, which is similar with approach coping that engages with the diabetes and its causes (such as seeking treatment) should lead to higher depressive symptoms. In support of this, Gafvels and Wandell (2006) found that problem – focused coping was responsible for higher depressive symptom. However, other studies have contradicted the model proposed by Lazarus (1991). For instance the studies of (Duangdao and Roesch 2008) found that individuals with diabetes who used more approach coping, problem-focused coping, and emotion-focused coping, experienced less depression in dealing with diabetes than those individuals who used less of these coping methods. Lo (2002) also found active coping to have two opposite directions by increasing and reducing depression when one is dealing with a focal stressor (e.g. financial, or depression). On the other hand, Clarke and Goosen (2008), found no significant association between problem-focused coping and depression among diabetes patients.

The diagnosis of diabetes usually come as a shock and is certainly a stressful time (Wijenaike, 2002; ADA, 2007). There is however no consensus on the models explaining the origin and mechanism of stress. This creates a gap in knowledge, hence, a positive demand for more studies. The studies below presents evidences from literature that explore the stressors/stress related to diabetes patients

2.3.2 Studies on Stressor/Stress

Peyrot and McMurry (1992) examined the Stress Buffering and Glycemic Control, and the role of coping styles among insulin-treated adults from the diabetes Division of Henry Ford Hospital. A total sample of (N=105) patients, filled the questionnaires of the Perceived Stress Scale (PSS) and Coping Styles Measures. Evidence from the study showed higher levels of stress association with people who do not cope effectively with stress.

Riazi, Pickup and Bradley (2004) used a longitudinal study to examine the relationship between daily stress and glycaemic control in people with type 1 diabetes over 21 days. A sample of (N=54) patients, filled the Daily stress measure of the Hassles and Uplifts Scale and the Coping Inventory for Stressful Situations (CISS) at the baseline. The finding of the study showed a strong significant correlation between stress and emotion-focused coping ($r = 0.93$; $P < 0. 01$) among the stress-reactive groups. But no relationship between stress and emotion-focused coping ($r = 0. 30$; $P = 0.06$) among the non-stress-reactive group.

Stantovic, Jasovic- Gasic and Mamaklar (2011) examined the relationship between glycemic control and depression severity in depressed patients; to estimate the risk factors of depression in patients with type 2 diabetes. A total sample of (N=90) patients completed the Patients Health Questionnaire (PHQ-9), Beck depression Inventory (BDI), Scaling of Life Events (SLE), and Problem Areas in Diabetes (PAID). The findings from the study showed statistically significant higher number of self-reported life events, in depressed diabetic patients than the non-depressed ones.

Chiu, Tsang, Chow and Chow (2006) examined the relationship among treatment-related stress, anxiety and depressive symptoms, distress, and impairment among Chinese’s out-patients with type 2 diabetes mellitus (DM) in Hong Kong. A total sample of (N=333) patients, completed the Diabetes Stress Questionnaire (DSQ). The findings from the study showed that the patients reported a variety of stressors associated with DM and/ or its treatments. In addition, the results indicated that among patients who were employed (67.0%), 55.7% (n=122) reported that work pressure led to a consequent deterioration of diabetes control and 45.9% (n=101) felt that DM affected work performance. However, among the unemployed or economically inactive (33.0%), 16.8% (n=18) reported being presently unemployed because of DM.

Hessler, Fisher, Mullan, Glasgow and Masharani (2011) examined the associations between patients' age, stress, depression, diabetes-related distress, self -efficacy, diet, exercise, and glycaemic control in adults with type 2 diabetes. A total sample of (N=506) patients, aged 21and 80 years filled the questionnaire of the Center for Epidemiological Studies Depression Scale (CES-D), Negative Life Events Scale (NLE), The Chronic Stressors Scale, Diabetes self-efficacy. The finding from the study showed that young adult patients reported experiencing higher levels of stress in respect to negative life events and on-going chronic stressors, higher levels of depressive symptoms and lower diabetes self-efficacy. However, these results suggest that younger adult patients with type 2 diabetes, compared to older adult patients, experience life as more stressful and are more depressed in managing their diabetes.

Discussion of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences and with which that were mostly influential in the prediction of patient's stress.

The findings provided evidence that stress is associated with coping among diabetes patients (Peyrot and McMurry (1992). In contrast, (Riazi, et al., 2004) found that non-stress reaction group reported no correlation between stress and emotion-focus coping. Similarly, (Riazi, et al., 2004) reported that in stress-reaction group, stress level correlated with coping. Hessler, (2011) reported that being type 2 diabetes associated with more stressful life. More so, given to the divergent measures used in assessing stress it is likely that type of diabetes variation could have being truncated.

Subsequently, Hessler (2011) assessed stress with more generic measure and reported more stressful life among type 2 patients. However, type of diabetes has demonstrated to be mostly determining factor in terms of the stress rate, and this requires further examination for Nigerian diabetic population.

On age, the studies of (Hessler et al., 2011) found that young adults who score low in self-efficacy reported higher levels of stress, negative life event, higher levels of depressive symptoms than the older adults. However, more studies are needed to replicate the findings for this study in a developing country like Nigeria where biengn diabetic may be more stressful due to the economical implication involved in the management.

2.4. Insomnia

2.4.1 Theoretical Framework

Experts from various organizations have unanimously concluded that there are no standard criteria for defining insomnia (APA, 2000; ASDA, 1990; WHO, 1992). Consequently, the estimates of its prevalence vary, with each definition yielding a different figure (Ohayon, 2002; Lachstein, et al, 2003; Roth and Drake, 2004).

According to U.S. National Center for Sleep Disorders Research (1999), " insomnia is an experience of inadequate or poor quality sleep characterized by one or more of the following: difficulty falling asleep, difficulty maintaining sleep, waking up too early in the morning, and non-refreshing sleep". Insomnia is a significant and prevalent public health problem. It may present as an independent disorder, but more often it is comorbid with another medical or psychiatric disorder.

More so, insomnia is a common problem with a prevalence of about 10%.While the highest prevalence estimates (almost 50%) comes from studies not assessing the frequency or severity of the sleep problems, employing the DSM-IV diagnostic criteria for insomnia yield much lower prevalence estimates (4% to 12%), Ohayon and Partinen (2002). However, as noted by Buysse (2005), use of such strict criteria in prevalence surveys may lead to an underestimation of those with clinically important sleep difficulties, as a considerable proportion of individuals with insomnia symptoms or who receive treatment for their sleep problems do not meet DSM-IV criteria for an insomnia diagnosis. The current study used 7 items to estimate the prevalence and severity of insomnia. More so, insomnia may be a component of the etiology of a disorder, such as diabetes mellitus or vice versa, Ancoli-Israel, (2006).

Furthermore, the prevalence and factors associated with insomnia in diabetes population have been largely studied in developed countries (e.g. Olsson et al, 2012; Plantinga, et al, 2012). But it is not known whether the results can be generalized to developing countries. A population-based study on insomnia among diabetes patients in a developing country like Nigeria is still very rare. Consequently, the relationship between socio-cognitive factors with insomnia remains unknown. For instance, it is not known whether the higher levels of insomnia usually observed in individuals with diabetes mellitus are associated with socio-cognitive health indicators such as self-efficacy and locus of control. However, investigation of these factors (socio-cognitive health indictors) with insomnia in individuals with diabetes is warranted.The inclusion of insomnia as a dependable variable in the current study is to examine the relationship between insomnia and socio-cognitive and socio-demographic factors and compare subgroups of individuals with insomnia severity, on how it associates with socio-cognitive and socio-demographic health factors. Research has shown that insomnia (Sleep difficulties) is more common in people who have diabetes than in people who do not. That is because having diabetes raises the risk for certain sleep problems such as sleep apnea and restless legs syndrome. More so, diabetes worsens when sufferers sleep less than 6 hours per night or more than 9. The loss of normal sleep hours or addition of sleep hours seems to undo the body’s chemistry and completely throw off-balance the blood glucose levels. Similarly, insomnia has a significant impact on individuals’ health and quality of life, particularly those with comorbid conditions e.g. diabetes (Roth, et al., (2007). It becomes very pertinentt to examine this variable in relation with diabetes patients’ socio-cognitive response. In this regard, the review on the relationship between insomnia and diabetes is described below.

2.4.2 Studies on Insomnia in Diabetes

Wisconsin and Indiana (2002) used a cross sectional study to examine the relationship between Insomnia and health related quality of life in patients with chronic illness. They reported that patients with mild and severe insomnia were likely to be female, poor, unemployed, unmarried and were more likely to have clinical depression. Similarly, the findings from the study showed a significant independent association between insomnia and HRQOL. More so, the association between insomnia and HRQOL was similar across age, gender, ethnicity and education.

Olsson, Ahlbom, Grill, Midthjell and Carlsson (2012) examined whether sleep disturbances and psychological well-being are associated with an increased risk of auto-immune diabetes in adults (including LADA and type 1 and type 2 diabetes). The findings from the study showed a primary linkage to poor sleep in males and low well-being in females. Similarly, the study indicated an association with type 2 diabetes in relation to sleep problems in male and low well-being, in both males and females.

Chao, et al., (2011) examined sleep duration in newly diagnosed type diabetes mellitus in Taiwanese population. A total sample of (N=3,470) were administered a structured questionnaire, which included the number of hours sleep. The findings from the study showed significant differences in age, gender, educational level, and sleep duration. However, both short sleep and long sleep duration were independently associated with newly diagnosed diabetes.

Song, Ye, Ye, Li, Wang and Hua (2013) used a cross sectional study to examine the possible risk factors of poor sleep quality in Chinese type 2 diabetes patients with Insulin Therapy. A total sample of (N=140) patients, completed the Pittsburgh Sleep Quality Index (PSQI). The findings from the study showed that proportion of subjects with a PSQI global score ≥ 5 was significantly different between males and females (39% vs 63%, P= 0.007). Similarly, only gender showed an independent risk factor for poor sleep quality, that is, for females versus males were 2.55 (95% CI = 1.24 -5. 27, P = 0.01). However, age and duration of diabetes were not associated with poor sleep quality.

Perfect, Patel, Scott, Wheeler, Patel, Griffin, Sorensen, Goodwin and Quan (2012) examined sleep, Glucose, and Daytime Functioning in Youth with type 1 diabetes. Items completed include the School Sleep Habits Survey (SSHS), Diabetes Quality of Life Youth Version (DQOL-Y), and the Pediatric Symptom Checklist (PSC). The findings of the study revealed that sleepiness and/or poor sleep habits correlated with reduced quality of life and depressed mood.

Plantinga, Rao and Schillinger (2012) examined the prevalence of self-reported sleep problems among people with diabetes in the United State. The patients completed the Sleep Habits Questionnaire, and the Functional Outcomes sleep Questionnaire, patients Health Questionnaire -9 (PHQ-9). The results from the study indicated that higher income were generally associated with lower prevalence of sleep problems. In addition, age and gender were not significant associated for any other sleep problem, and ethnicity did not modify the effect of these associations.

Discussion of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences and with which were mostly influential in the prediction of patients' insomnia.

Evidences from these studies showed contradicting results. The study of (Wisconson et al., 2002) showed significant interaction of gender and ethnicity in the prediction of insomnia.This is in contrast to the studies of Plantinga, Rao and Schillinger (2012 which shows that gender and ethnicity were not significantly associated for any other sleep problem. Similarly, Song et al., (2013) reported that gender showed an independent risk factor for poor sleep quality that is, being females were found reporting higher level insomnia. Conversely, the study of Olsson, Ahlbom, et al., (2012) indicated that type 2 diabetes males had more sleep problems. However, the reviewed studies on insomnia were more concentrated on homogeneous sample, that is, the participants were either of type 1 or type 2 none of the studies compared both types of diabetes. Therefore, this study intends to ascertain if any of the disease types is more influential in the prediction of insomnia.

2.5. Fatigue

2.5.1 Theoretical Framework

Fatigue is a word commonly used in everyday conversations, with subjective meanings which vary as different individuals' use it, such as sleepiness, tiredness, lacking energy and exhaustion are used interchangeably. However, within the scientific literature, definitions of fatigue also vary greatly, and defining fatigue becomes more challenging because there is poor differentiation among causes, indicators, and effects (Bartey, 1976; Winninggham, 1994). Fatigue has largely been defined as either a subjective symptom or an objective performance decrement (Wessely, 1998). However, fatigue is generally acknowledged to be complex and/or multifaceted encompassing physiological, psychological, and situational components (Mosso, 1904; NANDA, 2001).

The prevalence of fatigue varies between 7% and 45% (De-Rijk, 1999). Besides, it is a common problem in people with diabetes and other chronic diseases (Lewis and Wessely, 1992). The importance of fatigue may be greater in individuals with diabetes. Conversely, the prevalence of fatigue in diabetes has been reported up to 60% (Drivsholm et al., 2005; Fritschi and Quinn, 2010). Similarly, as noted by (Mosso, 1904; NANDA, 2001), in those suffering from diabetes, fatigue is likely caused by the interplay of physiological, psychological and lifestyle factors. For instance, the psychological aspect could be prompted when patients with diabetes do not experience positive results from their efforts in diabetes self-managements, or when they experience unanticipated or negative results, they may experience a sense of ineffectiveness or lack of accomplishment, and if this continues over time, they may experience emotional fatigue, cynicism, and resultant detachment from their health care-provider’s recommendations.

According to Fritschi and Quinn, (2010), these factors may play a role in exacerbating physiological fatigue or in adding a psychological dimension to it. However, this called for special attention for individual with diabetes. Moreover, for people with diabetes, fatigue is a pervasive and distressing complaint. Similarly, (Stover et al., 2001) found that fatigue is one of the top four symptoms found to interfere with self-reported quality of life in women with type 2 diabetes who rated their health poorer than women without symptoms. Furthermore, clinicians who work with patients affected by diabetes have noted anecdotally the considerable toll that fatigue takes on their patients, yet there is little empirical research describing the severity of the problem (Fritschi and Quinn, 2010).

Although literature is available about fatigue in the general diabetes population, but only 18% of studies include measurement of patients-important outcomes, such as symptoms or health- related quality of life, in their study designs (Gandhi et al., 2008) So far, few studies focus on the socio-cognitive health indicators (e.g. locus of control) to ascertain the severity of fatigue among diabetes population. Similarly, fatigue is a symptom of diabetes, but the impact of fatigue on the management of diabetes has not been thoroughly examined. So it’s clearly warranted to examine fatigue among diabetic patients in the Nigeria context.Studies on fatigue in diabetes are described below.

2.5.2 Studies on Fatigue in Diabetes

Lasselin, Laye, Dexpert, Aubert, Gonzalez, Gin and Capuron (2012) examined fatigue symptoms related to systemic inflammation in patients with type 1 and type 2 diabetes, from the Haut-Leveque Hospital in Bordeaux, France. A total sample of (N=40) patients, filled the Multidimensional Fatigue Inventory (MFI). The findings from the study showed that patients with type 2 diabetes exhibited higher fatigue scores, in the dimensions of general fatigue, physical fatigue than type 1 diabetic subjects.

Singh and Kluding (2013) examined the presence and severity of fatigue in people with type 2 diabetes. A sample of (n=37) individuals with diabetes and (n=33) individuals without diabetes completed the Fatigue Severity Scale (FSS), Fatigue Assessment Scale (FAS), and Visual Analog Fatigue Scale (VAFS). The results from the study indicated that people with diabetes scored higher on all 3 fatigue assessment scales as compared to controls (FAS: 25.11 vs 19.94, P= .001; FSS: 4.30 vs 2.59, P = . 000; VAFS: 4. 64 vs 1.75, P = .000). However, higher levels of fatigue were found in people with type 2 diabetes compared to matched control.

Weijman, Ros, Rutten, Schaufeli, Schabracq and Winnubst (2003) examined fatigue in employees with diabetes, its relation with work characteristics and diabetes related burden from three out-patients diabetes clinics in the Netherland. A total sample of (N=292) patients, 159 type 1 and 133 type 2 filled the social support from colleagues scale, Checklist Individual Strength (CIS) assessing general fatigue. The findings from the study showed that diabetes type and duration of disease do not contribute significantly to fatigue. In addition, the authors reported that fatigue is more severe in the case of lack of social support from colleagues and direct superiors.

Cuellar, Sarah and Ratcliffe (2008) examined how sleep quality, glycemic control, sleepiness, fatigue, and depression differ in persons with type 2 diabetes. A total sample of (n=39) participants, filled the Epworth Sleepiness Scale (ESS), The

Fatigue Severity Scale (FSS), and the Center for Epidemiologic Studies Depression Scale (CES-D). The results from the study showed that sleep quality index score were positively correlated with fatigue (r = .58, p= .002) and depression (r = .74, p < .001). Similarly, fatigue and sleepiness were positively correlated (r =. 36, p = .04).

Lasselin, Laye, Barreau, Rivet, Dulucq, Gin and Capuron (2012) examined fatigue and cognitive symptoms in patients with diabetes, its relationship with disease phenotype and insulin treatment. A sample of (n=21) patients with insulin-treated type 1 diabetes, (n=24) type 2 diabetic patients either insulin-free or undergoing insulin treatment, and (n=15) healthy subjects were assessed using the Multidimensional Fatigue Inventory (MFI), Cambridge Neuropsychological Test Automated Battery (CANTAB), Choice reaction time assessing attentional processes, and Visual Pattern Recognition Memory (PRM) assessing visual memory. The findings from the study showed that type 2 diabetes independent of treatment status, exhibited higher score of general fatigues, physical fatigue in comparison to healthy participants. However, the authors reported that these effects were more prominent in insulin-treated type 2 diabetic patients who also exhibited higher scores of general, physical fatigues than type 1 diabetic subjects. In addition, the authors reported no significant difference between groups in scores of mental fatigue (F (3, 56) = 1.4, p> 0.05). Similarly, duration of disease was not associated with fatigue symptoms.

Discussion of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences and with whichwere mostly influential in the prediction of patient’s fatigue.

The findings from the studies of (Lasselin, et al., 2012; Singh and Kluding 2013) showed that patients with type 2 diabetes exhibited higher fatigue scores in the dimensions of general fatigue, physical fatigue than type 1 diabetic subjects. On the other hand, Weijman, et al., (2003) reported that fatigue do not significantly differ by the types of diabetes. In this study, no significant difference was detected between individuals with type 1 versus type 2 diabetes. However, these studies yield mixed results due to different questionnaire assessing fatigue. For instance, (Weijman, et al., 2003), used specific dimensions of fatigue (The Checklist Individual Strength while (Lasselin et al., 2012) assessed fatigue with the Multidimensional Fatigue Inventory which may have explain the difference in these findings. In regards to this, Singh and Kluding (2013) recommended the Fatigue Severity Scale (FSS), for measuring fatigue in diabetes population and further suggested for more studies to explore the contributing factors to fatigue in diabetes population. Therefore, this also requires further examination which the current study has indepthly given focus to

2.6 Life Satisfaction and Quality of Life

2.6.1 Theoretical Framework

Researchers have argued that there is no single general measure of health status that would prove valid and reliable enough for international comparison (knurowski, Lazic, van-Dijk, Geckova, Tobiasz-Adamczyk & van den Henvel (2004). Though countries' health can be compared by means of objective measures such as life expectancy specific cause (e.g. morbidity or mortality), however, these measures do not pinpoint all dimensions of health and do not necessarily reveal the general health status (Knurowski et al., 2004). Conversely, although people's health, may not be described only objectively, in contrast or in addition, a more precise view on health status can be obtained by subjective measures, and the assessment of quality of life is by definition assumed to be such a subjective measure (Diener et al,1999). Additionally, life satisfaction can be defined as a cognitive self-assessment based on the individual's life priority (Diener, Emmons, Larsen & Griffin, 1985). These variables may therefore be important as factors associated with response to diabetes.

Quality of Life

With regard to quality of life, there is no universally accepted definition for Health Related Quality of Life (HRQOL), however, scientists agree that HRQOL reflects a patient's subjective appraisal and encompasses multidimensional constructs such as social and role functioning, emotional health, physical functioning, concerns about the future, and general well-being HRQOL (Fayers and Machin 2007). Similarly, numerous attempts have been made as regard to the definition of quality of life. Of the several available definitions, the most widely used and comprehensively derived definition is that by Orley et al., (1998) and, The World Health Organization Quality of Life (WHOQOL) Group.

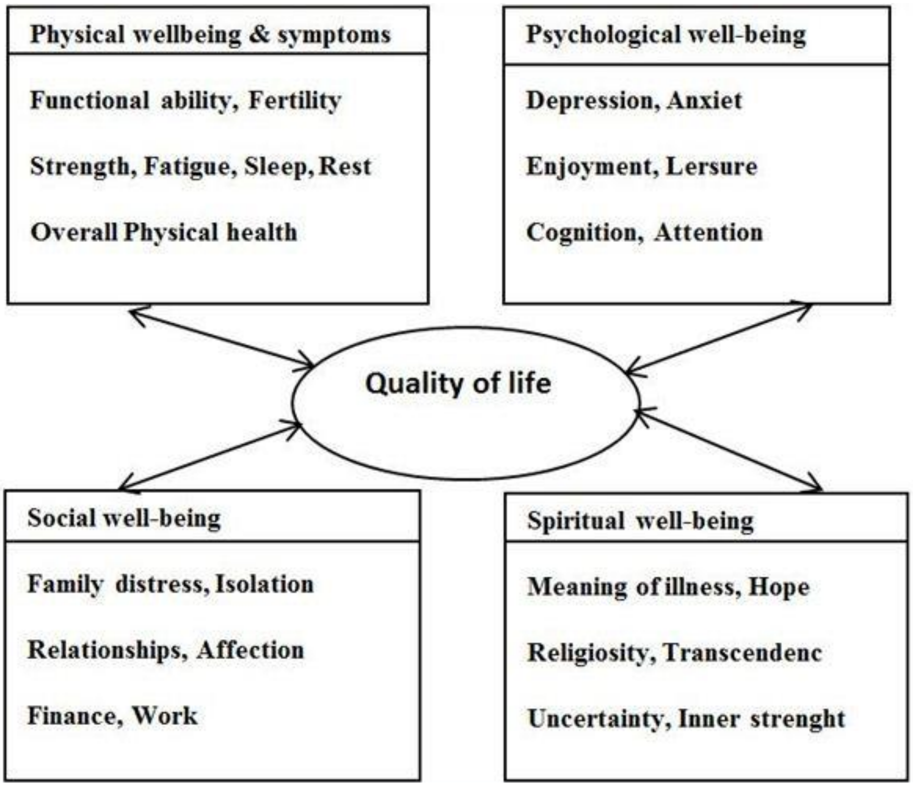
According to the World Health organisation, quality of life is ‘individual’s perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, standards, and concerns’ (The WHOQOL Group, 1995, p. 1405). In addition, the WHO, (1994) definition includes six domains: physical health, psychological health, and levels of independence, social relationships, environmental features, and spiritual concern.

On the other hand, an informal definition of quality of life has been provided by Lehman (1996), as “Patients’ perspectives on what they have, how they are doing, and how they feel about their life circumstances”. Lehman further argues that quality of life covers a person’s sense of well-being; often it also include how they are doing (functional status), and to what resources and opportunities they have access (p.78). However, the Lehman model suggests that ultimately, quality of life is a subjective matter, reflected in a sense of global well-being, and this experience depends on at least three types of variables: (a) personal characteristics, such as age and Sex; (b) objective quality of life in various domains of life, such as income level; and (c) subjective quality of life in these life domains, such as satisfaction with income. In contrast to the WHO perspective, Quality of Life differs from subjective well-being, in that the latter concerns itself primarily with affective states, positive and negative.

Conversely, many studies of HRQOL in diabetes patients have been performed and comprehensive reviews are available in the literature (e.g. Rubin and Peyrot (1999; Watkins and Connell 2004). Various domains of functioning and well-being contribute uniquely to overall HRQOL, implying that a multidimensional measurement approach is required (Rose et al, 1998). In light of this, the majority of quality of life studies involving diabetics have been performed using multidimensional assessment including the physical, psychological, and social functioning and well-being. The two major approaches to measuring HRQOL are generic and disease-specific instruments, and the two have been compared (e.g. Anderson et al, 1997; Woodcock et al, 2001) in diabetes patients and shown to demonstrate complementary quality of life and provide different kinds of information, with the generic ones perhaps providing more information than their disease-specific counterparts (Parkerson et al, 1993).However, the conceptualization of quality of life in this current study is based on the WHO’s definition, a widely accepted conception of health related quality of life as a multidimensional construct comprising at least three core domains: physical, social and psychological well-being. Similarly, researchers (e.g. Meeberg, 1993; Ware, 1987) argue that a person him/herself is the best evaluator of his/her health related quality of life in the domains of physical, psychological, social and spiritual well-being. See Figure 2.1 below.

Figure 2.1 Quality of Life Model

Adapted from Ferrel, Hassey and Dow *et al*. (1995).



Furthermore, the US Department of Health and Human services (1990), maintained that health related quality of life is the value assigned to duration of life as modified by impairments, functional states, perceptions, and social opportunities as influenced by disease, injury, treatment or policy.

Accordingly, the US Department of Health and Human services (1990) recommended that any assessment of quality of life of either individual or population, must include the dimensions that are generally acknowledged to contribute to the quality of life (e.g. physical /role functioning, emotional/psychological functioning, social functioning and somatic/ physiological complaints). More so, the available studies on Life Satisfaction and Quality of Life in diabetes are described below.

2.6.2 Studies on Life Satisfaction and Quality of Life in Diabetics

Imayama, Plotnikoff, Courneya and Johnson (2011) examined the determinants of quality of life in type 2 diabetes population with personality. A total sample of (N=1,147) patients completed the two indicators of Quality of Life (health-related quality of life –HRQOL, and the Life Satisfaction –LS). The findings from the study showed that older age, and a higher income were significantly associated with a higher health-related quality of life (HRQOL). Similarly, older age, female gender, having a partner, having a college degree and a higher income were positively associated with life satisfaction (LS).

Hussein, Khther and Hadithi (2010) examined the impact of diabetes on physical and psychological aspects of quality of life of diabetics in Erbil city. A total sample of (N=150) type 1 and type 2 diabetic patients filled the World Health Organization Quality of Life (WHOQOL-100) questionnaire. The authors reported high statistical significant variations in the physical domain of QOL in relation to age (P = 0.017), gender (P = 0.004), Level of education (P = 0.003) Marital status (P= 0.001), type of Work (P = 0.007) and Duration of diabetes (P= 0.001). Similarly, the study found a high statistical significant variation in the psychological domain of QOL in relation to the level of education (P = 0.016), Marital status) P = 0.049), and type of work (P =0. 015). In the authors' conclusion, being females had a greater impact on the QOL than being males and older patients are affected physically than psychologically.

Unden, Elofsson, Andreasson, Hillered, Eriksson and Brismar (2008) examined gender differences in Self-Rated Health, Quality of Life, Quality Care, and Metabolic control in patients with diabetes at the Korolinka University Hospital, Stockholm, Sweden. A total sample of (N=223) patients, (109 males, and 114 females) completed the Self-Rated Health Questionnaire, Quality of Life Instrument and the Coping questionnaire. The findings from the study indicated that middle age females rated their mental well-being and quality of life as worse compared with males (P < 0 .001 and P< 0 .005, respectively).

Akinci, Yildirim, Gozu, Sargin, Orbay and Sargin (2008) examined Health related quality of life (HRQOL) of patients with type 2 diabetes in Turkey. A total sample of

(N=376) patients, filled the Diabetes Quality of Life (DQOL). The findings from the study revealed that patients who were less than 40 years of age, males, married, had less than 8 years of education had higher score of DQOL. Similarly, the authors reported that patients with less than 5 years of diseases duration reported significantly better HRQOL ($p < 0.05$).

Ibrahim, Mubi, Omeiza, Wakil, Rabbebe, Jidda and Ogunlesi (2013) used a cross sectional study to examine depression and Quality of Life among adults with diabetes at the University of Maiduguri Teaching Hospital, Nigeria. A total sample of (N=288) patients, 18 - 60 years of age were assessed using the Composite International Diagnostic Interview (CIDI), and the World Health Organization Quality of Life (WHOQOL Brief). The results from the study showed that the depressed respondents had consistently rated their quality of life poorer than their non-depressed counterparts. However, the differences were only statistically significant on the psychological and social relationship domains.

Rose, Georgiewa, Fliege, Kocalevent, Arck and Klapp (2004) used a cross sectional study to examine psychosomatic factors as determining the quality of life and Metabolic control in patients with diabetes. A total sample of (N=625) patients, (224 type 1, 401 type 2) from 32 different treatment facilities participated. The participants filled the questionnaire of the World Health Organization Quality of Life (WHOQOL-Brief), coping Behavior (FKV), and diabetes- specific knowledge (DWT), doctor-patients relationship (MISS), and personality characteristics (GTS), SWOP). The findings from the study showed that persons characterized by strong feelings of self-efficacy and an optimistic outlook on life demonstrate more active coping Behavior and prove more to have a higher quality of life.

Verma, Luo, Subramaniam, Sum, Stahl, Liow and Chong (2010) examined the determinants of health related quality of life (HRQOL) in patients with Diabetes mellitus. A total sample of N=537 patients completed the Center for Epidemiological Studies Depression Scale and the Short Form 36 Health Survey (SF-36). The results from the study showed that patients with depressive symptoms had significantly worse Quality of Life than those without depressive symptoms. In addition, the study showed ethnic difference in relation to the domain of mental health, that is, Indians reported poorer HRQOL in the domain of Mental Health.

Sundaram, Kavookjian, Patrick, Miller, Madhavan and Scott (2007) examined the relationships between patients reported outcomes and clinical outcomes in type 2 diabetes mellitus at the out-patients clinics of a University Hospital. A total sample of (N=385) patients, completed the measures of generic health status (SF-12), diabetes-specific quality of life (Audit of Diabetes Dependent Quality of Life – ADDQoL), and the (Center for Epidemiologic Studies Depression- CES-D. The results from the study revealed that those with depressive symptoms had significantly poorer diabetes quality of life. In addition, the authors reported that being female, older age and not having depressive symptoms are associated with higher ADDQoL Score (indicating lesser impact of diabetes on Quality of Life).

Aalto, Uutela and Aro (1997) examined the associations of Health factors and psycho-social factors with Health Related Quality of Life (HRQOL) in adults with type 1 diabetes. A total sample of (N=385) patients, filled the measures of Health related quality of life (MOS SF-20), and the psychosocial measures of general social support, diabetes social support, diabetes locus of control (DLC), Self-efficacy, and diabetes health beliefs and self-care practices. The findings from the study showed that diabetes specific psycho-social factors explained 17% and 11% of the variation in these HRQOL dimensions, respectively. The authors reported that older age was related to poorer health related quality of life (HRQOL) in health perception ($P< 0.05$). Similarly, lower education was associated to poorer HRQOL in health perception, mental health, social functioning, role functioning, and pain. In addition, the study showed that perceived adequacy of social support is associated to better quality of life (HRQOL), in all dimensions, except role functioning and pain. While availability, duration of diabetes showed no significant associations to quality of life (HRQOL). However, strong self –efficacy was related to better perceived health, mental health and social functioning.

Hussein, Khther and Hadithi (2011) examined the association of certain socio-demographic and clinical characteristics of diabetic patients with quality of life. A total sample of (N=300) patients, completed the World Health Organization Quality of Life (WHOQOL-100). The findings from the study showed that the overall and general health QOL of diabetic patients is significantly affected by age ($P= 0 .014$), years of formal education ($P=0 .003$), type of work ($P= 0 .006$), duration of disease ($P= 0.004$). Similarly, Physical domain of QOL of diabetic patient's is significantly affected by age, Gender, year of formal education, types of work, duration of disease and monthly income. While the psychological domains of QOL of diabetic patients are significantly affected by year of formal education, type of work, duration of disease, and monthly income. However, the authors reported that the social domains are significantly affected by residence, marital status, and type of diabetes; while environmental domains are affected by age, years of formal education, type of work and monthly income respectively.

Naughton, Ruggiero, Lawrence, Imperatore, Klingensmith, Waitzfelder, McKeown, Standiford, Liese, and Loots (2008) carried out a cross sectional search for diabetes in a Youth study that examined the associations between demographic and diabetes management variables and the health-related quality of life (HRQOL) of youths with type 1 or type 2 diabetes mellitus DM. The search identified a total of (N=2,440) sample of participants aged 8-22 years. The authors’ findings indicated that HRQOL was significantly higher (better) for youth with type 1 DM than those with type 2. Similarly, they found a significant age and gender interaction, such that older groups, HRQOL was lower for females but higher for males.

Kolawole, Mosaku and Ikem (2009) used a cross sectional study to compare two measures of quality of life in a Nigerian clinic among patients with type 2 diabetes mellitus. A total sample of (N=53) patients, completed the Well-being Questionnaire WBQ and the World Health Organization Quality of Life (WHOQOL-Brief). The findings showed no significant correlation by characteristics such as age, gender, marital or educational status. In addition, the results showed that there is no significant association by treatment type with quality of life or well-being.

Odili, Ugboka and Oparah (2010) examined the impact of diabetes on the health-related quality of life in (N=112) diabetic patients at the University of Benin teaching hospital (UBTH) and Owen- Jackson Obaseki foundation clinic along with 81 healthy controls without diabetes. The participants filled the World Health Organization Quality of Life Questionnaire-Short Version (WHOQoL-BREF). The results indicated a significant low Health –related quality of life of diabetic patients than for the controls in all the domains except for environment domain. In addition, the authors reported no significant difference in HRQOL between diabetic males and females in all the domains.

Novato, Grossi and Kimura (2008) used a cross sectional study to examine the quality of life related to health and self-esteem of adolescents with type 1 Diabetes Mellitus. A total sample of (N=124) patients, aged 12-18 years completed Diabetes Quality of Life for Youths (DQOLY) and The IQVJD and Rosenberg's Self Esteem. The authors reported a positive relationship between quality of life and self-esteem, that is, the higher the self-esteem, the better the quality of life of the adolescent with type 1 diabetes.

Papadopoulos, Kontodimopulos, Frydas, Ikonomakis and Niakas (2007) examined the predictors of health-related quality of life in type 2 diabetes patients. A total sample of (N=229) patients, filled the generic SF-36 as used to measure HRQOL. The results from the study showed that female gender anddiabetes duration were the most predictors of impaired quality of life. However, older age, lower education, and being unmarried associate with impaired health- related quality of life.

James, Morakinyo, Eze, Lawani and Omoaregba (2010) examined the relationship between depression and the subjective assessment of quality of life (QoL) among patients with diabetes Mellitus (DM) attending out-patients clinics at a regional University Teaching Hospital in Nigeria. A total sample of (N=200) patients, completed the depression module of the Schedule for the Clinical Assessment in Neuropsychiatry (SCAN) and the World Health Organization Quality of Life Assessment- Brief (WHOQOL- Brief). The results showed a significant association between major depression disorders MDD with lower mean scores on the facets of overall Quality of Life and health satisfaction, but not in the domains of physical health, psychological health, environment and social relations of the WHOQOL-Brief.

Wee, Li, Cheung, Fong and Thumboo (2006) examined the influence on health-related quality of life in diabetes mellitus in a population-based, multi-ethnic study. A total sample of (N=309) patients, age 21 to 65 years completed the measures of perceive health (short-form 36 health survey SF-36, and the SF-6D). The findings from the study showed that ethnicity significantly influenced health-related quality of life HRQOL. However, the authors concluded that ethnicity is an important determinant of HRQOL in this study population, independent of age, gender, education, and other potential determinants of HRQOL.

Misra and Lager (2007) used a cross sectional study to examine ethnic and gender differences in psychosocial factors (e.g. social support, quality of life) in type 2 diabetic patients from two health clinics in Bryan and College Station, TX. A total sample of (N=180) patients, filled the perceived social support and the Diabetes Specific Quality of Life Scale (DSQOL).The results from the study indicate significant ethnic and gender differences in receiving social support, and quality of life among type 2 diabetic patients, however, differences were more pronounced by gender than by ethnicity.

Quandt, Graham, Bell, Snively, Golden, Stafford and Arcury (2007) used a cross sectional study to examine the effects of diabetes disease burden and social resources on health-related quality of life (HRQOL) among older rural adults with diabetes. A total sample of (N=701) patients, completed the Short Form Health Survey (SF-12), and the Center for Epidemiologic Studies (CES-D). The findings from the study showed that higher physical HRQOL associated with male gender with few depressive symptoms. Similarly, the authors observed ethnicity differences in HRQOL between two ethnic minority groups, that is, the Native Americans had significantly lower HRQOL than Whites.

Kaholokula, Haynes, Grandinetti and Chang (2006) used a cross sectional study to examine ethnic differences in the relationship between depressive symptoms and specific aspects of health related quality of life in people with type 2 diabetes of Native Hawaiian. A total sample of (N=190) patients, of (50%), Filipino, (16%), Japanese (18%), and mixed-ethnic (16%) ancestries from rural community of North Kohala, completed the Center for Epidemiologic Studies-Depression (CES-D), Lubben Social Network Scale (LSNS) and the Health related quality of life short from-36 (SF-36). The findings from the study showed no statistically significant difference between ethnic group differences in mean scores for depression, social network support and quality of life. In addition, a hierarchical analysis showed a significant proportion of the variance in depression score accounted for by the interaction effect of ethnicity and the physical functioning subscale. While no statistically significant variance in depression score accounted for the interaction between ethnicity and the quality of life subscales of role-physical functioning, social functioning, and health Transition.

Eren, Erdi and Sahin (2008) examined the effect of depression on quality of life in type 2 diabetes mellitus. A total sample of (N=60) patients, 30 males and 30 females completed the Hamilton Rating Scale for Anxiety (HRSA), Hamilton Rating Scale for Depression (HRSD), and Turkish version of The World Health Organization Quality of Life Assessment Brief (WHOQOL-BREF). The findings from the study showed that physical health, psychological health, social relationship, environmental and social pressure domain, general health-related quality of life, overall quality of life, and WHOQOL-BREF total scores were significantly lower in depressed group than the non-depressed group. Similarly, there were significantly negative correlations between HRSD and HRSA score and physical health, psychological health, social relationship, environmental and social pressure domain, general health-related quality of life, overall quality of life, and WHOQOL-BREF total score. In addition, the findings showed a significant positive correlation between the level of education and physical health, psychological, social relationship, environmental social pressure domain, overall quality of life and WHOQOL –BERF total score. Similarly, age and duration of illness showed a negative significant correlation between social relationship domain score.

Papathanasiou, Shea, Koutsovasilis, Melidonis, Papavailiou and Lionis (2008) used a cross sectional study to examine the relationship between quality of life, health status and psychological distress in patients with diabetes mellitus in both primary and secondary care in Greece. A total sample of (N=504) patients, completed the questionnaire of the generic instrument Short Form-36 version 2 (SF-36 v2), and the disease-specific Problem Areas in Diabetes (PAID) Scale. The findings from the study showed that patients with type 2 Diabetes Mellitus from the urban out-patients clinic had significantly lower levels of quality of life than patients from the rural the primary healthcare centre.

Discussion of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences and with which that were mostly influential in the prediction of patient’s quality of life.

In terms of gender, the studies of (Hussein, Khther and Hadithi 2010; Unden, et al., 2008; Papadopoulos, et al., 2007; Akinci, et al.,2008; Quandt, et al., 2007;

Naughton, et al., 2008; Imayama, 2011) showed that female gender, associates with impaired health- related quality of life and life satisfaction. In contrast to the study of Sundaram, et al., (2007) were being female associated with higher ADDQoL Score (indicating lesser impact of diabetes on Quality of Life. Similarly, (Kolawole, Mosaku and Ikem 2009; Odili, Ugboka and Oparah 2010) reported no significant difference in HRQOL between diabetic males and females.

In addition, Verma, et al., 2010; Wee, et al., 2006; Quandt, et al., (2007) reported that ethnicity significantly influenced health-related quality of life HRQOL. Conversely, the studies of Kaholokula, et al., (2006) showed no significant difference between ethnic groups in mean scores for quality of life. However, studies that measured Health Related Quality of Life using the World Health Organization Quality of Life (WHOQOL) e.g. (Kolawole, Mosaku and Ikem 2009; Odili, shows none interaction of gender or ethnicity with Health Related Quality of Life in contrast to the studies of Ibrahim et al., 2013. Whereas, most of the studies reviewed that employed diabetic specific and other generic measures showed that gender were mostly influential in the prediction of patient health related quality of life than ethnicity and type of diabetes.

For instance, in terms of type of diabetes, the studies of (Misra and Lager 2007; Hussein, Khther and Hadithi 2011) indicated significant ethnic and gender differences in quality of life among type 2 diabetic patients, however, the differences were more pronounced by gender than by ethnicity. In other words, gender was mostly influential in predicting patients' health related quality of life than ethnicity. Similarly, health related quality of life was significantly higher (better) for type 1 DM than those with type 2 (Naughton, et al., 2008; Novato, Grossi and Kimura 2008; Papathanasiou, et al., 2008). Therefore, the current study will further examine gender, ethnic and type of diabetes differences to establish which is mostly influential for Nigerian diabetic population.

2.7 Sense of Coherence (SOC)

2.7.1 Theoretical framework

Antonovsky (1987, 1996) advocated the use of sense of coherence (SOC) as a salutogenic approach, a construct explaining good health and positive adjustment. In this approach, health and disease are not dichotomous as in the traditional model, but

rather they are on a continuum between “ease” and “dis-ease”. SOC is a factor that focuses on the support of human health and well-being in contrast to factors that cause disease. Accordingly, the term salutogenesis comes from two Latin words: **salus,** which means **health,** and **genesis**; which means **origin.** The term salutogenesis therefore means the origin of health.
Antonovsky (1987, 1996) argued that given the inevitable and numerous stressors in human existence, whether one move toward the “ease” end of the continuum depends on a set of coping resources available to the individual. Antonovsky further explained that the higher the SOC an individual has achieved, the more able the individual to select appropriate coping strategies for confronting problems and thus moving towards the “ease” end of the continuum.

Antonovsky postulated three mutually interacting components of SOC: (1) Comprehensibility; which deals with the extent to which a person sees the world as ordered and is able to mobilise the resources needed to cope. (2) Manageability; which is the understanding of the problem and having the necessary resources to cope successfully. (3) Meaningfulness; which pertains to the belief that coping makes sense and that one wishes to cope (Antonovsky, 1993). In addition, the author maintained that all the three components of SOC are viewed as determining how a person can handle stress. Undoubtedly, salutogenesis has become an acceptable tool widely used in health psychology and in health promotion as a measure of positive health. In his lecture in Gothenburg in 1993, Antonovsky challenged the society with the responsibility of creating conditions that will enable the individuals to foster the strength of coping (Eriksson & Linostron, 2007). Furthermore, Antonovsky (1987), cited by Torsheim, Aaroe & Wold (2001) postulated that sense of coherence influences stress and health through three major routes:sense of coherence influences whether a stimulus is appraised as stressor to poor health; the extent to which a stressor leads to poor health or not; and the extent to which tension leads to adverse health consequences.

Furthermore, Antonovsky (1987) argued that an individual’s SOC is essential to his/her long-term health. The results of various empirical studies support this argument. In order to deal successfully with the complexities of everyday life and remain healthy, all three components of SOC are necessary. To the degree that individuals with a strong SOC can more effectively neutralize the harmful effects of stress, they appear to realize greater physical and mental health (Koushede & Holstein, 2009; Lindfors, Lundberg, & Lundberg, 2006; Lundberg & Nystrom Peck, 1994; Smith & Mayers, 1997). Stronger SOC has shown to predict good health in both men and women (Uutela, & Koskenvuo, 2001) whereas weak SOC is strongly related to health problems and has been found to predict adverse health prospects more than a strong SOC predicted good health (Kivimaki, Feldt, Vehteria, & Nurmi, 2000; Toivanen, 2007).According to Antonovsky (1987), individuals with high SOC are more likely to fight back positively and overcome stress and its harmful health hazards in contrast to those with low SOC. In addition, SOC is a flexible and adaptive dispositional orientation that enables successful coping with adverse experience and the maintenance of good health (Wainwright, Surtees, Welch, Luben, Kay- Teekhaw & Bingham, 2007). More so, these findings and the evidences below provide strong support for an association between stronger SOC and more favourable psychological health, among individual with diabetes. Consequently, since diabetes imposed behavioral and lifestyle changes, particularly in dietary and exercise habits which arenecessary for the majority of patients with diabetes but are difficult to carry out. However, Antonovsky describes a salutogenic health perspective grounded in patients' developing what he terms 'a sense of coherence' (SOC). Therefore, the question then is can a strong SOC help diabetes patients to control the disease stressors? To answer this question was the main reason for the inclusion of this variable in this study in order to explore diabetes patients' comprehensiveness, manageability and meaning making for being diabetic and how it associated with psychological health indicators in the Nigerian context. Below are the reviews of studies on sense of coherence in diabetic population.

2.7.2 Studies on Sense of Coherence

Kouvonen, Vaananen, Woods, Heponiemi, Koskinen & Toppinen-Tanner (2008) used a longitudinal study conducted in an 18-year follow-up to examine sense of coherence (SOC) and incidence of diabetes among (N= 5827) Finnish male employees aged 18-65 years. At baseline filled, the questionnaire comprises of (SOC -29) version, health-risk Behaviors questionnaire and 11-items of psychological distress measuring insomnia, depressive symptoms, tension and anxiety. The responds rate was 76%. The results from the study showed that, age, educational attainment, marital status and psychological distress were significantly associated with a weak (low) SOC due to diabetes. In addition, the study did not found any significant association between SOC and diabetes in the older age group (>50 year-olds). However, the authors recommended further studies in other counties especially, to examine the psychosocial mechanisms behind the association between SOC and diabetes, and investigate the associations of other individual differences in diabetes population.

Lundman and Norberg (1993) examined the relationship between Sense of Coherence SOC and coping patterns among type 1 diabetic patients in Sweden. A total sample of (n=20) patients filled the SOC Scale and the worry scale. Evidence from the study showed a significant, negative correlation between SOC and worries about insulin reactions. The authors argued that their findings support the importance of SOC as a factor contributing to successful emotional coping.

Cohen and Kanter (2004) examined the relation between glycemic control and sense of coherence (SOC) and the mediating role of psychological distress and adherence to self-care Behaviors. A sample of (n=67) diabetic patients of type1 & 2, and additional (n=29) individuals without any chronic disease participated as control group from the diabetes clinic at the Rambam Medical Center in Haifa Israel. The items used include adherence to self-care Behaviors inventory, Derogatis' Brief Symptoms Inventory, and Anthovsky's SOC Scale. The results from the study showed that SOC had a significant, negative relationship with psychological distress. That is, a higher SOC were related with less psychological distress. However, the authors found, that people with type 1 or type 2 diabetes proved more distressed than the control group, but did not differ in their SOC scores.

Yiny Shiu (2003) used a cross sectional study to examine sense of coherence amongst Hong Kong Chinese adults with insulin-treated type 2 diabetes attending the out-patients diabetic centre. A total sample of (N=72) patients, (n= 28) males and (n= 44) females aged 18-65 filled the questionnaire of the SOC-29 Scale and the worry Scale with a response rate of 70%. The findings from the study showed that SOC correlated negatively with fear of hypoglycaemia as measured by the worry scale (p=0.043), and fear correlated negatively with age (p=0.002). But no significant correlations were found between SOC and the remaining identified variables in the study. However, the findings suggest that respondents with high or low SOC demonstrated no significant difference in difficulties in managing the illness.

Sanden –Eriksson (2000) used a longitudinal study to examine coping with type-2 diabetes: the role of sense of coherence compared with active management, with 8 years follow up of total sample of (N=88) participant were assessed with Anthovsky’s SOC Scale short version, and the health acceptance measure. The findings from the study showed that self-assessed health had a strong positive relationship with SOC ($p<0.001$). In addition, the author reported that patients who estimated their own health better than the health of others, had a higher sense of coherence.

Discussion of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences and with which that were mostly influential in the prediction of patient’s sense of coherence.

Few studies that examined the relationship between SOC and Psychological health found contradictory results (e.g., Kouvonen *et al*., 2008; Cohen and Kanter 2004) found that SOC associated with patient’s psychological health, that is patients who scored high on SOC reported less psychological distress, and the SOC score were not significantly different among types of diabetes. In contrast, the study of Sanden –Eriksson (2000) reported that self-assessed health had a strong positive relationship with SOC. Whereas, Yiny Shiu, (2003) found that respondents with high or low SOC demonstrated no significant different in psychological distress. The current study will further examine the relationships between the Psychological health of diabetic patients and SOC as echoed by Kouvonen et al., 2008 .Only the studies of Lundman and Norberg (1993) examine the relationship between Sense of Coherence SOC and coping. However Lundman and Norberg (1993) found that SOC to active coping predicted no worries about insulin reactions, on the other hand, avoidance coping alone leads to worries about insulin reactions. The authors Lundman and Norberg (1993) reported that their findings support the importance of SOC as a factor contributing to successful emotional coping. However, in the available reviewed studies on SOC none of the studies compared gender and ethnic difference of SOC and this will be the focus of the current study.

2.8. Locus of Control

2.8.1 Theoretical Framework

The concept of locus of control finds its origin in Rotter’s (1954) social learning theory and hold that individuals develop expectations about what determines different life outcomes through their previous life experiences. According to Rotter (1966), locus of control is essentially a unidimensional construct reflecting the degree to which someone attributes the consequences of their Behaviors to internal or external factors. Wallston et al., (1978); Levenson (1973) expanded the number of expectancy dimension in the multidimensional health locus of control scale, which measures whether an individual regards their health as controllable by them (e.g. I am directly responsible for my health (Internal), and (chance) which measures whether an individual regards their health as not controllable by them and in the hands of fate (e.g. Whether I am well or not is a matter of luck); or under the control of powerful others (e.g. I can only do what my doctor tells me to do).

Health locus of control (HLC) is believed to be important, as it is thought to determine whether individuals will take responsibility for their own health or not. Because individuals with a high internal HLC believe that their health is influenced by their own efforts and skills, they are more likely to engage in health-promoting and sustaining activities. In contrast, individuals with more external HLC are less likely to engage in positive health practices, as they believe that their health is beyond their control and determined by powerful other, fate or chance. Interestingly, studies on locus of control for positive and negative outcomes among diabetic patients, found patients with internal locus of control to show good diabetes management and improved mental health (Maltby et al., 2007). This is well supported in the literature but in contrary, there has been little evidence that external locus of control contributes to psychological wellbeing.

2.8.2 Studies on Locus of Control

Chen and Lin (2014) used a descriptive correlational design to examine the relationships among Health Locus of Control, Psychosocial Status and Glycemic

Control in Type 2 Diabetes Adults. A total sample of N=285 diabetic outpatients from the clinics in Southern Taiwan were sampled. The instruments used for the data collection where The Multidimensional Health Locus of Control Scale (MHLC), developed by Wallston, Wallston and DeVellis in 1978; The Self-Efficacy Scale, developed by Chen et al. which consists of four dimensions and 19-items, including general (5-items), diet (5-items), exercise and foot care (4-items), and medication (5-items); The 21-item self-report Depression Anxiety Stress Scale (DASS-21) developed by Lovibond and Lovibond with the aim of assessing depression, Anxiety and stress. and the Diabetes Self-Care Behavior Scale, developed by Hsu et al., which consists of four dimensions and 14-items, including wound care (4- items), nutrition (3-items), medication (4-items), and SMBG (3-items). The findings from the study showed that internal health locus of control was significantly positively correlated with self-efficacy ($\beta=0.32$, $P < 0.001$) and self-care Behavior ($\beta=0.17$, $P < 0.001$), and significantly negatively correlated with depression ($\beta=-0.18$, $P < 0.01$). External health locus of control was significantly positively correlated with depression ($\beta=0.24$, $P < 0.001$) and self-efficacy ($\beta=0.32$, $P < 0.001$). No significant correlation existed between external health locus of control and self-care behavior ($\beta=0.06$, .05).

Morowatisharifabad, Mahmoodabad, Baghianimoghadan and Tonekaboni (2009) examined the locus of control in a sample of n=120 diabetic patients in Iran. The participants completed the Iranian versions of Diabetes locus of control scale. The results from the study showed that males significantly outscored females on basis of internal locus of control while females significantly outscored males on the basis of chance locus of control. The authors reported that gender differences on the basis of powerful other locus of control were not significant. Similarly, the study found no statistical significant differences in type of diabetes on locus of control scale. In addition, the findings showed a statistically significant positive correlation between internal locus of control and level of education ($r=0.216$, $P< .05$) and a statistically significant negative correlation between chance locus of control and level of education ($r= -0.192$, $P< .05$).

Aalto, Uutela and Aro (2000) used a cross sectional study to examine diseased-related distress and its associations with health and psychosocial factors among

Insulin-treated diabetic person. A total sample of (N=423) patients, filled the questionnaire including the diabetes-specific social support, diabetes locus of control (DLC), self-efficacy, diabetes health beliefs and self-care practices and subjective health. The findings from the study showed that greater distress were related to lower availability and adequacy of general social support, lower internal DLC, higher chance, significant others and professional DLC, and poor perceived health. In addition, the findings showed that individual contributions to explaining the variance in diabetes distress were 1% for demographic factors. Similarly, the study found no strong associations between socio-demographic factors with diabetes distress, apart from moderate correlation between lower education and strong distress. However, the authors' findings indicate that those with stronger internal orientation actually perceived their diabetes as slightly more stressful.

Metsch, Tillil, Kobberling, and Sartory (1995) examined the relation between psychological distress, diabetes-related health Behavior and metabolic aspects of diabetes in adult patients with type 1 diabetes mellitus at the Department of Endocrinology and Metabolism of the Departments of Medicine of the Ferdinand-Sauerbruch- Klinikum Elberfeld. A total sample of (N=51) patients, 29 females and 22 males age range of 17 to 61 year filled the questionnaire including the State- Trait Anxiety Inventory (STAI), IPC Questionnaire of locus of control, Quality of life index (QLI) and Erlanger depression Skala (EDS). The findings from the study showed that scores on internal locus of control, powerful others and chance were not significantly different between male and female. However, duration of diabetes correlated negatively with internal locus of control, depressive mood and quality of life.

Jacobson, Hauser, Wertlieb, Wolfsdorf, Orleans and Vieyra (1986) examined the psychological adjustment of children with recently diagnosed diabetes mellitus and children with recently acute medical problems; 76% and 54% of both sample groups filled the measures of the Coppersmith self-esteem, Nowicik-Strick-land locus of control measure, and Diabetes Adjustment Scale (DAS). The results from the study showed a strong association (r= -.60) between locus of control and psychological adjustment to diabetes, such that the more external the perception of control, the worse the reported adjustments to diabetes. In addition the findings showed power of others to be associated with less successful diabetes adjustment.

Peyrot and Rubin (1994) examined the structure and correlates of diabetes-specific locus of control in a 5-days out-patients education program at the John Hopkins Diabetes Center. A total sample of (N= 165) patients, completed a set of questionnaires of the Grossman self-efficacy in diabetes scale, Rosenberg self-esteem scale, the zung self-rating anxiety scale, the center for epidemiological studies depression scale, and locus of control scale drawing upon the MHLC scale. The result from the study showed that internal locus of control significantly ($p \leq 0.05$) associated with short duration of diabetes, but with none of the three measures of emotional well-being (depression, anxiety self-esteem). In addition, power others DLC was associated ($P \leq 0.05$) with older age, female gender, less education and NIDDM, and with one of the three emotional factors (more anxiety). However, chance DLC was associated ($P \leq 0.05$) with female gender, less education, and NIDDM, and with all three of the emotional factors (less self-esteem and more depression and anxiety).

Fuscaldi, Cristina, Balsanelli and Grossi (2011) examined the relationship between locus of control, and self-esteem with socio-demographic of (N= 65) diabetes mellitus type 2 patients at the League of Diabetes Control Endocrinology Outpatients Clinic of the Hospital das Clinicas, University of Sao Paulo, Medical School. Items used were the Multidimensional Health Locus Control Scale (MHLC), and the Feeling of Self-esteem Scales. The findings from the study showed no differences among the group ($P= 0.11$) in comparison between internal and gender. In addition, the study found a statistically significant relationship in the comparison between external-chance and gender. That is, females scored higher in this dimension than males. Similarly, the result showed that females had the perception that events they experienced depended on chance.

H'Hea, Moon, Grothe, Boudreaux, Bodenlos, Wallston and Brantley (2009) examined the interaction of locus of control, self-efficacy, and outcome expectancy in relation to HbA1c in individuals with type 2 diabetes from the department of internal medicine and family practice clinics of a public teaching hospital in Louisana. A total sample of (N=109) patients, 26% (n=28) males and 74% (n=81) females aged 18years or older filled the form C of the Multidimensional Health Locus of Control scale (MHLC) Wallston et al. (1994), and the Multidimensional Diabetes Questionnaire (MDQ) for both self-efficacy and outcome expectancy subscales. The results from the study showed that individuals who have higher internal LOC related to their diabetes and tended to be more likely to have greater confidence in their ability to follow their doctor’s treatments, recommendations for diet, exercise, medication, and glucose monitoring. Additionally, the study found that individuals with greater internal LOC are more likely to believe that actually performing the said Behaviors will result in better-controlled diabetes and better health outcomes. However, in contrast, Chen and Lin (2014) reported that those with an internal locus of control have an easier time managing chronic health conditions such as diabetes, and tend to have better psychological health outcomes, than those who do not.

Discussion of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences and with which that were mostly influential in the prediction of patient’s locus of control.

There was a consensus among the reviewed studies that locus of control associated with psychological health indicator (depression and quality of life) and their relationship differ by gender. For instance, a strong relationship between diabetic patients’ psychological health and locus of control were reported by the studies of (Metsch, et al., 1995; Jacobson *et al*., 1986; Peyrot and Rubin 1994; H’Hea et al., 2009). However, this relationship is inconclusive and controversial. For instance, (Metsch, et al., 1995) found that internal locus of control correlated negatively with depressive mood and quality of life, while Chin and Lin (2014) found that external health locus of control significantly and positively correlated with depression. Similarly (Peyrot and Rubin 1994) found no association with internal locus of control on the three measures of emotional well-being (depression, anxiety self-esteem). These findings supported other well-known assumptions postulated by numerous researchers, that individuals with internal health locus of control (IHLOC) will exert stronger influence over health Behavior among individuals who value their health highly compared with those with other priorities in life (Rotter, 1990; Bennett, et al., 1998; Michinov, 2005).

Furthermore, in terms of gender Metsch, Tillil, Kobberling, and Sartory (1995) reported that scores on internal locus of control, powerful others and chance were not significantly different between male and female. On the other hand, Peyrot and

Rubin (1994) reported that subscale of Locus of Control power other DLC, chance DLC was associated with being female. In addition, Fuscaldi, et al., (2011) reported significant difference between-chance and gender. That is, females scored higher in this aspect than males.Furthermore, the authors explained that females' perception showed that the events they experienced depended on chance. Surprisingly, locus of control has been recognized as an important domain in diabetes and it is important to explore these beliefs to help diabetes patients to self-care. To date, the diabetes literature has explored the relationship between negative domains of psychological health with few factors. The literature is not conclusive in relation to internal and external locus of control domains and its relationship to other psychological variables and how diabetic population may vary in terms of their ethnicity and types of diabetes. However, feelings of personal control are also likely to affect one's well-being, amongst other psychological variables (Bradley, 1994). Therefore, it is requiring examining these factors within Nigeria context.

2.9. Self-Esteem

2.9.1 Theoretical Framework

Self-esteem is widely investigated in the field of personality psychology. Historically, the first influential definition of self-esteem dates back to James (1890), who considered self-esteem to be the ratio of success and pretension in important life domains. However, more recent definitions refer to self-esteem as a positive or negative evaluation towards oneself (Rosenberg, 1990), and indicates the degree to which one experiences oneself as worthy and capable (Rosenberg, 1979). Similarly, (Harter, 1999) refers to self-esteem as the evaluative and affective dimension of the self-concept, and is considered as equivalent to self-regard, self-estimation and self-worth.

Self-esteem is considered as one of the factors that influence both the perception of threats and the evaluation of possible coping reactions. Positive self-esteem and self-confidence can buffer stress by mitigating the perceived threat and by enhancing the selection and implementation of efficacious coping strategies. As Lazarus and Folkman (1984) state: viewing oneself positively can also be regarded as a very important psychological resource for coping.

Empirical studies over the last 30 years indicate that self-esteem is an importantpsychological factor contributing to health and quality of life (Evans, 1997). Recently, several studies have shown that subjective well-being significantly correlates with high self-esteem, and that self-esteem share significant variance in mental well-being (Zimmerman, 2000), while low self-esteem leads to maladjustment; a causal factor in depression, and anxiety (Glick and Zigler, 1992).
Evidence from literature maintained that the relation between self-esteem and anxiety has only rarely been studied (Roberts, 2006). Whereas, several theories postulate that self-esteem serves as a buffer against anxiety (Crocker & Park, 2004). Although, cross sectional studies have reported negative, medium-effect sized to strong correlations between the constructs (Lee & Hankin, 2009; Riketta, 2004; Watson et al., 2002). Similarly, the researcher for the current study is not aware of any available study that explicitly focused on the retrospective relationship between self-esteem and anxiety among diabetes population. This lack of sufficient research is of much concern because anxiety is commonly reported among diabetes mellitus patients. However, study of self-esteem among diabetes population is warranted as to ascertain the contributing impact, and association between self –esteem with anxiety.
On the other hand, self-esteem has been thought to play a central role in the etiology, maintenance, and recovery from depression (Beck, 1967; Brown et al., 1990); both theory and research support the contention that low self-esteem often is a concomitant of depression and anxiety. However, studies analysing the relationship between self-esteem and depressive illness have yielded mixed results. For example (Miller et al., 1989) reported in their study that low self-esteem is a significant risk factor in the development of clinical depression. In contrast, other studies (e.g. Lewinsohn et al., 1981) cast doubt on the idea that low self-esteem predisposes depression, and instead suggest that negative evaluation of one’s self is merely a consequence or symptom without causal import.

Conversely, self-esteem has also been reported to predict stress in individuals with chronic disease (Adams & Weaver, 1986) and was found to cause more problems for type 2 diabetes patients (Maki, 2004). The secondary appraisal proposed by Lazarus and Folkman, Schneiderman et al., (2005), explains that individuals with low self-esteem may lack the coping resources necessary to regulate environmental stressors. More so, many people with diabetes struggle with their control due to issues such as poor self-esteem (Janes et al., 2013). However, based on the aforementioned evidences, it is assumed that self-esteem will predict an individual's perceived frequency and degree of stressful thoughts and experiences and this would be valuable to explore in this present study.Surprisingly, there is dearth of study that examines self-esteem and psychological health indicators. More so, it is important to note that most of these studies e.g. Sullivan, (1978); Sabri et al., (2014) focused their research only on children/ adolescent and compared diabetic patients and non-diabetic. Based on this limitation, the current study is to explore further, the relation of self-esteem with psychological health indicators (e.g. depression, stress and anxiety) among adults/ adolescent and specifically for people with type 1 and type 2 diabetes in Nigeria.

2.9.2 Studies on Self-Esteem in Diabetes

Sabri, et al., (2014) examine the health-related quality of life (HRQoL) and self-esteem (SE) of children and adolescents with type 1 diabetes mellitus with those of non-diabetic ones in Egypt. A sample of (n= 42) non-diabetes age 10-18 years completed the diabetes-specific HRQoL and Area-Specific Self-Esteem Scale. The findings from the study showed that diabetic patients had lower self-esteem (2.31) than healthy ones (2.05), as higher scores indicate lower self-esteem. More so, the result from the study showed that diabetic patients have lower quality of life than the healthy ones in the physical, emotional, and social domains. Similarly, the authors concluded that the self-esteem and quality of life concepts are related, that is, the better the quality of life of diabetic patients, the higher the self-esteem. However, in the study of Novato, Grossi and Kimura (2008) mentioned earlier, they reported a similar result with that of Sabri et al., (2014) whereby the authors reported a positive relationship between quality of life and self-esteem, that is, the higher the self-esteem, the better the quality of life of the adolescent with type 1 diabetes.

Meneses, Blanes, Veiga, Gomes and Ferreira (2011) used a cross-sectional, comparative study to examine the health-related quality of life and self-esteem in patients with diabetic foot ulcers. A sample of (n=35) consecutive patients with diabetes mellitus attending out-patients clinics in Pouso Alegre, Brazil. Fifteen (n=15) patients with and 20 without diabetic foot ulcers were administered the

Medical Outcomes Study 36-item Short-Form Health Survey (SF -36) and Rosenberg Self-Esteem Scale. The findings from the study showed that females had higher HRQoL score than males. Similarly, the self-esteem scores were similar for both groups. Furthermore, the authors further recommended that future studies should include other assessments of specific quality of life aspects, such as depression, life satisfaction and self-esteem. However this finding is in conflict with the findings of Sabri, et al., (2014) whereby, they reported that diabetic patients had lower self-esteem than healthy ones.

Sullivan, (1978) examined self-esteem and depression in diabetic adolescent girls. A sample of (n=105) diabetic girls and (n=100) non-diabetic girls age 12-16 completed the Rosenberg Self-Esteem Scale and the Beck Depression Inventory. The findings from the study showed no significant difference between diabetic and non-diabetic girls in self-esteem scores. In addition the study results indicated that diabetic girls showed significantly more depression than non-diabetic girls.

Murawski, Chazan, Balodimos and Ryan (1970) examined personality patterns in patients with diabetes mellitus of long duration with non-diabetic. Items completed were the Rosenberg Self-Esteem Scale and the Beck Depression Inventory. The findings from the study showed a significant negative correlation between depression and self-esteem, that is, the higher depression scores among the diabetic group the lower their self-esteem level than the non-diabetic comparison group. In addition, the authors found that self-esteem significantly associates with duration of illness. That is, the longer the duration of the diabetes, the more likely the diabetic patients to have lower self-esteem.

Discussion of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences and with which that were mostly influential in the prediction of patient’s self-esteem.

The paucity of study on the relationship between self-esteem and psychological health indicators warrant further studies on the role self-esteem play in the response of diabetic psychological health. More so, given to the fact that the study of Sullivan, (1978); Murawski et al., (1970) found that self-esteem was negatively related with depressive symptoms among diabetic patients, which they argued that since low self-esteem associated with longer duration of diabetes leading to higher depressive scores in the diabetic group that more studies are needed since several of the diabetic patients gave intriguing, elaborate descriptions of their interactions with their families, that future studies should investigate the importance of self-esteem and social support in the development of depression for the adolescent patient. On the other hand, the study of Sabri et al., (2014) showed that diabetic patients had lower self-esteem than the healthy ones and they were also lower in quality of life than the non-diabetic group healthy ones. In contrast, the study of Meneses et al., (2011) found that self-esteem scores were similar for both the diabetic group and the non-diabetic patients.

In addition, it is important to note that these studies focused only on children/ adolescent and compared diabetic patients and non-diabetic, given to this limitation, the current study seeks to examine further the relation of self-esteem with psychological health indicators (e.g. depression, stress and anxiety) among both adolescent and adults across type 1 and type 2 diabetes patients in Nigeria.

2.10. Coping

2.10.1 Theoretical Framework

Coping is the process of attempting to manage the demands created by stressful events that are appraised as taxing or exceeding a person's resources (Lazarus & Folkman 1984). In addition, it is action-oriented and intra-psychic efforts to manage, master, tolerate, reduce or minimize the demands of stressful environment (Lazarus & Launier 1978). Coping with illness is a major theme in health psychology (Smari & Valtysdottir, 1997). Similarly, coping is an essential mediator in adapting to chronic diseases such as diabetes mellitus Madhu & Sridher (2001).Most models distinguish between problem-focused (management of the problem that is causing the distress) and emotional coping (management of the distressing emotions associated with the problem). Others have subdivided problem focused and emotion-focused strategies into several aspects of coping to provide a multidimensional assessment of coping mechanism (Carver, Scheier, &Weintraub, 1989). Recent research has included a third main coping mechanism: Avoidance coping (Eldler &Parker, 1994). This type of coping 'serves as a form of escape from the unpleasant stressful situation' Parker & Eldler, (1992).

However, the problem-focused strategy is generally associated with more positive outcomes (Moss-Morris, Petrie, & Weinman, 1996). In contrast, emotion-focused / or avoidance coping strategies are related to longer term negative outcomes (Heijmans, 1999; Helder et al., 2002; Rutter & Rutter, 2002; Scharloo et al., 1998).

According to Lazarus and Folkman (1984), people usually resort to a combination of problem-focused and emotion-focused coping in stressful encounters. Problem-focused coping concentrates on dealing with stressors itself, whereas emotion-focused coping tries to deal with emotional response to stressors (Bouchard et al., 2004). There is, however, no clear consensus as to which coping styles are most effective in terms of resolving problems or preventing future difficulties (Folkman & Moskowitz 2004). On the other hand, Lazarus (1991) asserts a close connection between the choice of coping strategies and the emotional experience. He suggests that self-blaming and avoidance strategies, such as Behavioral disengagement, are related to negative emotions whereas more approach oriented strategies and avoidant coping may in the long run, be less adaptive than problem-focused coping.

Research has also suggested that problem-focused coping (such as problem-solving, planning and seeking social support) may be particularly important for adjusting positively to diabetes (Cox & Gonder-Frederick 1992). In contrast, as shown in an earlier study by Karlsen et al (2004), emotion-focused styles, avoidant coping and self-blaming predicted impaired well-being and increased emotional distress among people with type 1 and type 2 diabetes. Similarly, studies have shown that, diabetes patients who use more problem-focused and fewer emotion-focused strategies demonstrate less psychological distress, greater psychological adjustment, and greater self-reported control (Karlsen, Idsoe, Hanestad, Murberg, & Bru, 2004; Macrodimitrus &Endler, 2001; Smari & Valtysdottir, 1997).

However, researchers Duangdao and Roesch 2008; Clarke and Goosen 2009; Karlsen et al., 2004; Gafvels and Wandell 2006; Samuel-Hodge et al., 2008) reported that diabetes patients adopt different coping styles in the adjustment to their condition. These identified coping styles included: (1) Approach coping (e.g. active coping, positive expectation, seeking information and support, (2) Avoidance coping (e.g. passive coping, self-blame, distance/ distraction and venting, (3) Problem-focused coping (e.g. planning/ logical analysis, seeking and instrumental support. (4)

Emotion-focused coping (e.g. acceptance, religious activity and seeking emotional support.

2.10.2 Studies on Coping in Diabetes

Lawson, Bundy, Belcher and Harvey (2010) used a cross sectional longitudinal study to examine the relationship of personality traits and diabetes health threats communication (DHTC) to the coping strategies of newly diagnosed diabetes patients. A baseline sample of N=138) patients, filled the Illness Perception Questionnaire (IPQ), Diabetes Health Threat Communication Questionnaire (DHTCQ), Mini-marker instrument and the (COPE) inventory (Situational version). The findings from the study showed that higher educational level associated with more active coping, planning, gaining, instrumental support, emotional support, and less acceptance. Similarly, age associated with gaining less emotional support. But none of the other demographic variables were related to coping.

Edgar and Skinner (2003) examined illness representations and coping as predictors of emotional well-being in adolescents with type 1 diabetes. A total sample of (N=126) adolescents patients, 64 females and 62 males filled the measures of Well-being Questionnaire, diabetes illness representation questionnaire (DIRQ), and the kid-cope items. The study found no significant difference of coping between males and female. Similarly, no gender differences for anxiety (females M=5.2, SD=2.6; Males M=4.4, SD=2.3) or positive well-being, However, females reported being significantly more depressed than males. In addition, the findings showed no other significant associations between demographic variable and coping or well-being measure.

Clarke and Goosen (2008) examined the mediating effects of coping strategies in the relationship between automatic negative thoughts and depression in a clinical sample of diabetes patients attending the New Zealand Northland Health retinopathy clinic. A sample of (n=130) patients, 57 males and 57 females returned completed questionnaires which contained the Depression symptoms inventory, Automatic thought Questionnaire (ATQ), and Ways of coping checklist (WCC). The study found no significant differences between male and female mean scores on the problem-focused coping, emotion-focused coping and depression. In addition, the finding showed no significant gender and ethnicity differences in the proportions of the sample.

Macrodimitris and Eldler (2001) examined the relationship of both coping strategies and perceived control to psychological and physiological adjustment among adults with type 2 diabetes. A total sample of (N=115) patients, 65 females and 50 males completed the Coping with Health injuries and Problems scale (CHIP), Event Perception measure, Eldler Multidimensional Anxiety Scale-State subscale (EMAS-S), and Center for Epidemiological Studies Depression scale (CES-D). The findings from the studies showed that palliative coping and emotional preoccupation coping positively related to both depression and anxiety. However, instrumental coping, on the other hand, negatively related to depression, but unrelated to anxiety.

Enzlin, Mathieu and Demyttenaere (2002) examined gender differences in the psychological adjustment to diabetes in type 1 patients. A total sample of (N=280) out-patients, attending the University Hospitals of the Catholic and University of Leuven (UZ Gasthulsberg) completed the Utrechtse coping list (UCL), Beck Depression Inventory (BDI), Martial Satisfaction, The Appraisal of Diabetes Scales (ADS), The ATT19 or Diabetes Integration Scales and the Dyadic Adjustment Scale (DAS). The findings from the study showed a significant gender difference in the psychological adjustment to diabetes. That is, Males reported more positive appraisal of their diabetes and were more satisfied with their partner relation than females. In addition, females reported more significant depressive symptoms than males did and more females had a clinical depression: 24.7% of female versus 7.4% of male. However, the study found that, males and females differed significantly in their overall coping strategies: Males used more active coping than females, and less avoiding, less social support seeking and less depressive coping. Similarly, males and females did not differ significantly in emotional adjustment to diabetes, expressive of negative emotions, palliative coping and the use of comforting ideas as coping strategies.

Duangdao &Roesch (2008) used a meta-analysis to examine coping with diabetes in adulthood. The authors guide for the meta-analysis were based on published papers with the word ‘coping’ and ‘diabetes’ including human adults (18 years and older), 21 studies met the inclusion criteria with a total of (N=3381) participants. Of these participants, n=2457 with type1 and n=876 with type 2 diabetes, and n=48 with other subtypes. The findings from the meta-analysis indicated that Individuals with diabetes who used more approach coping, problem-focused coping, and emotion-focused coping, experienced less depression in dealing with diabetes than those individuals who used less of these coping methods. Nevertheless, the authors reported no significant association between avoidance coping with depression.

Karlsen, Idsoe, Hanestad and Murberg (2004) used a cross sectional study to examine the relationship between support from health care professionals and the family, diabetes-related coping, and psychological well-being in adults with types 1 and type 2 diabetes. A total sample of (N=534) Norwegian adults ages 25 to 70 completed the questionnaires assessing perceptions of support, diabetes-related coping styles and psychological well-being. The findings from the study showed that supported family Behavior were relatively strong and positively associated with problem-focused coping, and as well significantly and negatively associated with emotion-focused coping for the sub samples type 1 (B=0.38; - 0.23, respectively and type 2 diabetes (B=0.29;-0.22, respectively. Moreover, the study found that non-supportive family Behavior showed relatively strong and positive associations with emotion-focused coping for both types of diabetes, whereas the associations with problem-focused coping were strong and negative only for the sub-sample of type 1 diabetes. In addition, further analysis of the study showed a strong and positive association of emotion-focused coping with scores for symptoms of anxiety and depression as well as negative associations with general well-being for both types of diabetes (B = 0.37; 0.41; 0.37, respectively.

Karlsen, Oftedal and Bru (2009) used a cross sectional study to examine the relationship between clinical indicators, coping styles, perceived support and diabetes-related distress among adults with type 2 diabetes. A total sample of (N=425) Norwegian adults, aged 30-70 years, with type 2 diabetes, completed the problem area in diabetes (PAID), Dis-positional version of the COPE Inventory, Patients Questionnaire on Empowerment and Diabetes Family Behavior Checklist (DFBC). The findings from the study showed that age yielded statistically and negative association with PAID score, reflecting that younger people had higher scores for distress. In addition, the result showed a significant difference between coping styles and emotional distress. However, the authors explained that substantially, greater variance in emotional distress was accounted for by subjective variables such as coping styles and perceived support rather than by clinical indicators.

Gafvels and Wandell (2006) examined coping strategies in men and women with type 2 diabetes in four primary health care centres in Stockholm County. A sample of (N=321) patients, aged 35-64, (n=121) men and (n=111) women completed the measure assessing the General Coping Questionnaire (GCG). Evidence from the study found gender differences for the coping strategies resignation, protect and isolation, with higher score for women. In addition, the study showed a negative correlation between problem focusing and psychiatric disorders. However, the correlation between coping scales and socio-economic factor were low.

DeCoster and Cummings (2004) used a mixed- methodological approach to examine coping methods of adults with type 2 diabetes, and explore whether patients' race and gender influences coping styles. A total sample of N=37) patients, filled the questionnaire of the ways of coping checklist. The findings from the study showed gender difference in coping with diabetes, males reported fewer coping methods than females. In addition, the result indicated that males, on average, reported fewer emotion-focused coping methods than females. Similarly, males also reported problem-focused methods than females. However, differences of coping across racial based groups occurred among African-Americans but not among the Caucasian, and non-Latinos.

Huang, Courtney, Edwards and McDowell (2010) used a cross sectional study to examine factors that affect health outcomes in adults with type 2 diabetes at the endocrine out-patients departments from three hospitals in Taiwan. A convenience sample of (N=334) patients aged 40 and above completed the self-reported questionnaire of problem area in diabetes (PAID), International Physical Activity Questionnaire-short version (IPAQ), Diabetes Coping Measure (DCM), The Medical Outcomes Study (MOS) Social Support Scale, Health related Quality of Life (Short form-12 SF-12v2), and the Diabetes Self-care Activities (SDSCA). The findings from the study revealed that low burden of diabetes symptoms and high levels of coping strategies and social support significantly predicted high levels of health-related quality of life.

Pretorius, Walker and Esterhuyse (2010) used a cross sectional study to examine the extent to which coping responses could predict the level of life satisfaction experienced by patients suffering from diabetes mellitus. A total sample of (N=154) patients aged 18 year and older filled the questionnaire of Coping Responses Inventory Adult (CRI-A) and the Satisfaction with Life Scale (SWLS). The findings from the study showed that two of the avoidance coping sub-scales (cognitive avoidance and acceptance or resignation) correlated significantly with satisfaction with life at 1% level; in both instances the correlation is negative. In addition, the result showed that the higher the avoidance coping scores, the lower the satisfaction with life scores.

Samuel-Hodge, Watkins, Rowell and Hooten (2008) used a cross sectional study to examine Coping styles; Well-being and Self-care Behaviors among African Americans with type 2 diabetes. A total sample of(N=185) patients, filled the questionnaire of the Jalowiec Coping Styles Measure, Perceived Stress Scale (PSS), the Short Form Health Survey (SF-36), Perceived Diabetes and Dietary Competence (PDDC), Problem Areas in Diabetes (PAID), Diabetes self-efficacy and Spirituality and Church Involvement Scale. The findings from the study showed a correlation between coping styles, demography, psychosocial, and Behavior. Similarly, strong associations between passive coping, age and educational attainment were reported, that is, older persons and those with lower levels of educational attainment reported using passive forms of coping more frequently. In addition, the result showed no significant gender differences in coping styles. However, participants who reported frequent use of emotive coping also perceived greater levels of stress, more problem areas in diabetes. But emotive coping were negatively associated with both diabetes-specific and general mental well-being.

Tuncay, Musabak, Gok and Kutlu (2008) examined the relationship between anxiety, coping strategies and characteristics of patients with diabetes. A total sample of (N=189) patients, completed the State-Trait Anxiety and the Brief COPE Scale. The study found significant correlations between age, type of diabetes and duration of diabetes, gender, educational status and monthly income. Similarly, anxiety positively correlated with gender, educational status, and monthly income. That is, males had higher level of anxiety than females, individuals with higher degree of education had more anxiety than those with less education and persons who have higher monthly income had higher levels of anxiety than individuals with less monthly income. In addition, the study showed that problem focused coping strategies such as acceptance; religion, positive reframing, and emotional support were negatively related to anxiety. However, anxiety negatively correlated with venting and self-distraction as for emotion-focused coping strategies.

Luyekx, Vanhalst, Krenke and Weets (2010) examined the typology of coping with type 1 diabetes; its associations with demographic, psychological, and clinical parameter. A total sample of (N=194) Patients, aged 18-30 years filled the questionnaire of the Problem Areas in Diabetes Scale, Illness Perception Questionnaire, Rosenberg Self-esteem Scale and the Center for Epidemiologic Studies Depression Scale. The findings from the study indicated that age and diabetes duration were unrelated to these variables, except for the associations between diabetes duration, depression and avoidance coping. However, the study found statistical significant differences between problem areas in diabetes, illness perceptions, depressive symptoms, and self-esteem.

Discussion of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences and with which that were mostly influential in the prediction of patient’s coping.

The findings provided evidence that coping is related to the psychological health indicators (e.g. anxiety, depression, Stress and well-being among diabetes patients. (Tuncay, et al., 2008; Samuel-Hodge et al., 2008; Pretorius et al., 2010; Huang et al., 2010; Karlsen et al., 2009; Macrodimitris and Eldler 2001).

Samuel- Hodge et al., (2008) found a correlation between coping style, demographic and mental well-being, whereas the studies of Edgar and Skinner (2003), found no significant association between demographic variables and coping styles or well-being. Similarly Duangdao and Roesch (2008) found no significant association with coping (i.e. avoidance coping and depression. In contrast, (Luyekx et al., 2010) found that coping (i.e. avoidance coping was significantly associated with depression among diabetic patients. Furthermore, the studies of (Karlsen et al., 2004) found a positive association of emotion-focus coping with score for symptoms of anxiety and depression for both type1 and type 2 diabetic patients, but (Tuncay et al. 2008) reported a negative correlation of emotion-focus coping with anxiety among diabetic patients. However, Gafvels and Wandell (2006) found a negative correlation between problem-focus coping and depression. Similarly, on ethnicity, Clarke and Goosen (2008) found no significant ethnic differences in the relationship between coping strategies and depression. In contrast, the study of (DeCoster and Cummings 2004) found ethnic differences in diabetic patients coping strategies.

On gender studies, (Edgar and Skinner 2003; Clarke and Goosen 2008; Samuel-Hodge et al., 2008) found no significant differences between males and females on the problem-focus coping and emotion-focus coping. Conversely, Enzline et al., 2002; Gafvels and Wandell 2006; DeCoster and Cummings 2004) found that male and female differed significantly in their overall coping strategies. Furthermost of the studies showed that gender explained more of variance and is mostly influential than ethnicity. Although, other studies e.g. Clarke and Goosen 2008; Samuel-Hodge et al., 2008 indicated conflicting results in terms of gender and this controversies require further investigation. As such, the findings from this study will make a contribution towards the understanding of this relationship among diabetic patients in Nigeria.

2.11. General Self–efficacy

2.11.1 Theoretical Framework

Bandura (1994) defines self-efficacy as, “peoples beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives, and determine how people feel, think, motivate themselves and behave. Although researchers have reported various factors that influence human Behavior (e.g. Rosenstock, 1974), Bandura maintained that self-efficacy is a key mechanism that influences both task performance and cognitive cultivation of the individual. According to him, individuals with a strong sense of self-efficacy will view difficult tasks as challenges that can be dealt with rather than be avoided (Bandura, 1997). Conversely, people with low self–efficacy may believe that things are tougher than they really are, a belief that foasters stress, depression, and a narrow vision of how best to solve a problem. However this occurs in several different ways. One route to depression is through unfulfilled aspiration as people who impose on themselves standards of self-worth judge themselves when they are unable to attain it, thereby driving themselves to to bouts of depression.

Furthermore, self-efficacy, as in the social cognitive theory (Bandura, 1977), has also been linked to chronic illness adjustment. Studies have shown that a low level of self-efficacy is related to psychological distress, negative affect, and Behavioral dysfunction in patients with chronic medical conditions (Beckham & Burker, 1997; Edwards, Cecil & Lenoci, 2001; Meldling, 1995; Stuifbergen, Seraphine & Roberts, 2000) as well as psychological maladjustment in elderly people (Holahan & Holahan, 1987; Johnson et al., 1998; Melding, 1995; Stenstrom et al., 1998; Wu et al., 2002).

Moreover, research has provided evidence of the influential effect of efficacy beliefs on human functioning in different areas such as work-related performance (Stajkovic & Luthans,1988), psychosocial functioning in children and adolescents (Holden, Moncher, Schinke, & Barker, 1990), academic achievement and persistence (Multon, Brown, & Lent, 1991), health functioning (Holden, 1991) and athletic performance (Moritz, Feltz, Fahrbach & mack 2000). Accordingly, Bandura (1999) proposed that all individuals are proactive and self- regulating rather than reactive and controlled by biological or environmental forces.Alternatively, individuals may possess self-belief that enables them to exercise a measure of control over their thoughts, feelings and actions. In addition, Bandura (1997), postulated in his social cognitive theory, that self-beliefs influence the choices people make and the causes of action they pursue.For instance, patients' sense of self-efficacy is the motivational beliefs about judgement (Betz & Klein, 1996). Similarly, self- efficacy was reported by previous studies to be related to quality of life, depression and self-esteem (Coultas et al., 2007; Penninx et al., 1998; DeVellis& DeVellis (2001).

Furthermore, Bandura (1977& 1997) postulated four informational sources of self-efficacy as: (1). Performance Accomplishments: he explained that individuals with a past history of accomplishments will always recall their past experience and perseverance in performing new tasks and are capable of mobilizing stronger self-efficacy beliefs with regards to that Behavior: (2)Vicarious learning: This concept is rooted in the learning and imitation of others and mentors who have demonstrated resilience and tenacity in the face of insurmountable obstacles: (3) Social persuasion:

This concept emphasises the importance of reinforcements and motivations which the social system can render to encourage the individual in persisting on the right path.For instance, in the case of unhealthy health Behaviors, (e.g., patients following their dietary self-care recommendation), counselling can be a motivating factor of social persuasions. (4) Emotional arousal: In this final point, Bandura (1977), assumes that individual's emotional status such as mood, anxiety or depression encountered in the performance of a task may discourage and demobilize such an individual and consequently he/she may give up. For example, patients dealing with the dietary requirements of diabetes, this may create the feeling for the patients to be less likely to follow their recommended dietary activities in the presence of emotional arousal by believing that following their dietary recommendation is not important in controlling their diabetes.

2.11.2 Studies on Self-efficacy

Cherrington, Wallston & Rothman (2010) used a cross sectional study to examine the relationship between diabetes self-efficacy, depressive symptoms among men and women with type 2 diabetes (N =162) patients from two primary care clinics, Uanderbilt University Medical Center and University of North Carolina School of Medicine. Items used for the collection of data were the Center for Epidemiologic Studies Depression (EES-D), Perceived Self-efficacy of Diabetes and Perceived Diabetes Self-Management Scale (PDSMS). The study found significant association between self-efficacy with depressive symptoms. However, the result showed that males had higher income levels, higher levels of self-efficacy and lower levels of depressive symptoms than females. In addition, the study found that self-efficacy strongly related to depressive symptoms.

Alipour, Zare, Poursharifi, Sheibani & Ardekani (2012) examined the role of self-efficacy in relation with stress, Glycosylated Haemoglobin and health related Quality of Life in Patients with Type 2 diabetes. The study used a random sampling to select (N=80) female patients. Items filled include: The Shirer's self-efficacy scale questionnaire, depression, anxiety and stress scale (DASS), and ADDQOL 19 questionnaire. The findings from the study showed that self-efficacy associated positively and significantly with stress and quality of life. According to the authors, the impact of stress on patients' health-related quality of life can be influence by self-efficacy. In addition, the result showed that stressed patients who perceive themselves capable and efficient try more to deal and cope with problem, conversely, those who perceive themselves incapable and inefficient submit easily and feel depressed, anxious and hopeless. The study found that self-efficacy increasing mental health.

Talbot, Nouwen, Gingras, Gosselin &Audet (1997) used a cross sectional study to examine diabetes-related cognitive and social factors among individuals with type 2 diabetes. A total sample of (N=249) patients, filled the questionnaire of the Beck depression Inventory (BDI) and a measure of self-efficacy subscale of the Multidimensional Diabetes Questionnaire. Evidence from the findings showed that higher scores on the Beck depression Inventory were associated with lower self-efficacy scores for diabetes management Behavior (diet, exercise, and weight control).

Sacco, Wells, Vaughan, Friedman, Perez & Matthew (2005) examined the role of adherence, body mass index, and self-efficacy on depression in adults with type 2 diabetes. A total sample of (N=65) patients, filled the measure of self-efficacy subscale of the Multidimensional Diabetes Questionnaire and the Patient Health Questionnaire PHQ-9. The findings from the study showed that lower self-efficacy scores were associated with higher number of depressive symptoms.

Discussion of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences and with which that were mostly influential in the prediction of patient's self-efficacy.The studies of (Cherrington et al., 2010; reported a significant association between self-efficacy and depressive symptoms for male diabetes patients. In contrast to (Sacco et al., 2005; Talbot et al., 1997) found no gender difference between self-efficacy and depressive symptoms of diabetes patients. Similarly, (Legato et al., 2006) called for further specific studies to explore potential factors on the relationship between depression for both males and females to facilitate the development of tailored interventions towards a goal of improving diabetes-related health outcomes.Furthermore, fewer studies have being conducted on the relation between self-efficacy and psychological health indicators (e.g. stress depression, anxiety, and quality of health life and satisfaction of life) among diabetic patients (e.g. Alipour et al., 2012), and these findings cannot be generalized to a developing country like Nigeria. For example (Sacco et al., 2005; Talbot et al., 1997) found that low score of self-efficacy associated with high depressive symptoms. On the other hand, (Howorka et al., 2000 Caroline et al., 2000) reported that high self-efficacy is associated with patient's life satisfaction. Conversely, (Onyeizugbo, 2010; Salami 2010) claimed that patients with lower depressive symptoms will consequently demonstrate higher degree of motivation and perseverance in the presence of obstacles and challenges, and will see problems as opportunities However, to date, there has been little research examining this hypothesis among diabetes mellitus population.

2.12. Optimism

2.12.1 Theoretical Framework

Optimism has been generally regarded as a cognitive variable (Scheier and Carver, 1987). Similarly, health psychology and the domain of subjective well-being have probably been the main arenas for studying effects of optimism and pessimism. However, not all research on this trait has had this focus. And within the last decade there has been a great deal of research interest in this area of personality, (e.g. in social and clinical psychology).

Several investigators have attempted to clarify the role of optimism in the use of adaptive coping Behavior (e.g. Scheier, Weintraub & Carver, 1986; Scheier &Carver, 1985), as well as in the promotion of better psychological and physical well-being (e.g. Chang et al., 1994; Mroczek et al., 1993). Similarly, studies have also been done to elucidate the role of pessimism in the use of maladaptive coping Behavior, and its relation to psychological illnesses (Mroczek et al., 1993; Peterson, Seligman & Vaillant, 1988).Chang et al., (1994) have also argued that the above area of research suffers from at least two major problems. First, there are still no generally accepted definitions of optimism and pessimism. Secondly, that there is confusion and controversy about the dimensionality of optimism and pessimism. However, the most popular view is Scheier and Carver's (1985) definition of optimism and pessimism as respectively generalized positive and negative outcome expectancies. This view assumes that a person is either optimistic or pessimistic; as polar opposite on a unidimensional continuum.

The widely used Life Orientation Test (LOT; Scheier & Carver, 1985) is based on this definition which this current study adopted because of its simplification andaccuracy in measuring optimism.In contrast, Dember et al, (1989), definition of optimism and pessimism as a positive and negative outlook on life. Whereas, Scheier &Carver's definition includes present perceptions and appraisals as well as future expectancies.

Generally the scientific definitions of optimism and pessimism focus on expectancies for the future which have been linked to a long history of expectancy-value models of motivation. The expectancy-value theories assume that Behavior reflects the pursuit of goals: desired states or actions. As the more important a given goal is to the person, the greater its values (Austin &Vancouver, 1996; Higgins, 2006). The other aspect of this motivational model is expectancy-confidence that can be attained. If people doubt they can reach a goal, they may withdraw effort toward it. They may stop prematurely, or the action may never really start. People who are confident about eventually reaching an outcome will persevere even in the face of great adversity.

The expectancy construct has a wide range of applicability in terms of optimism and pessimism as broad, generalized versions of confidence and doubt; they are confidence and doubt pertaining to life, rather than to just a specific context. For instance, optimists should tend to be confident and persistent in the face of diverse life challenges (even when progress is difficult or slow). Pessimists should be doubtful and hesitant in the same situations. More so, such differences in how people confront adversity have implications for success in completing goal–direct Behavior. They also have implications for the manner in which people cope with stress.

Although this viewpoint on positive expectancy outcome yet to be applied across time or event in chronic disease studies, several of these studies have demonstrated a positive outcome expectancies to be directly related to less depression in type 1 diabetes mellitus, rheumatoid arthritis and multiple sclerosis patients (Founier et al., 2002), and so this is a potentially valuable factors to be considered for diabetes research.

2.12.2 Studies on Optimism

Fournier, Ridder and Bensing (2002) used a cross sectional study to examine whether the relationship of the three optimistic beliefs with coping, depression, anxiety and physical functioning differs with the controllability based on the self-care options of chronic disease from the out-patients departments of five Hospitals in the Netherlands. The sample involved (n=104) patients with type 1 diabetes, (n=95) rheumatoid arthritis and (n=98) multiple sclerosis aged 18 to 65 years. Items completed include the Life Orientation Test (LOT-R), General Self-efficacy Scale, Risk Judgement Rating Forms, Coping Inventory for Stressful Situation (CISS), Hospital Anxiety and Depression Scale (HADS), Short Form Health Survey (SF-36). The findings from the study showed that Insulin dependent diabetes mellitus patients (IDDM) used significantly more task-oriented coping, and were less depressed compared with the rheumatoid arthritis and multiple sclerosis patients. However, the authors reported that positive outcome expectancies are directly related to less depression and directly as well as indirectly related to less anxiety by using less emotion-oriented coping.

Ridder, Fournier and Bensing (2004) examined whether optimistic chronically ill patients overestimate their health status by decreased symptoms report. The study sample (n= 50) multiple sclerosis (MS) and (n=65) type 1 diabetes mellitus (IDDM) patients. The items filled include: The Life Orientation Test (LOT-R), General Self-efficacy Scale, Risk Judgement Rating Forms, Positive and Negative Affectivity Schedule (PANAS), Denial Scale of the COPE and General Fatigue Scale of the Multidimensional Fatigue Inventory (MFI) and Short Form Health Survey (SF-36). The findings from the study indicated that in the IDDM sample only, positive outcome expectancies (i.e. optimism) were related to less Fatigue (r = - .33, P<. 01), thus indicating decreased symptom report.

Fournier, Ridder and Bensing (2003) used a cross sectional longitudinally study to examine whether chronically ill patients were less optimistic than a healthy control group. The sample comprises (n=90) type 1 diabetes, multiple sclerosis respectively and (n=60) control groups. The items filled includes: The Multidimensional Health Locus of Control Scale (MHLC), the Life Orientation Test (LOT-R), General Self-efficacy Scale, Risk Judgement Rating Forms, MS-Related Symptoms Checklist), Hospital Anxiety and depression scale (HADS), Short Form Health Survey (SF-36) and the Life Events scale. The findings from the study showed that IDDM patients with higher level of education reported higher levels of optimism (positive outcome expectancies) and efficacy (outcome efficacy expectancies) Similarly, female IDDM patients reported lower level of optimism than male IDDM patients ($r = -0.21$, $p < 0.05$). In addition, the study found no significant associations between optimism with age, employment status, and marital status. Conversely, the results indicated that in IDDM patients, disease duration, depressive symptoms and life events are related to a lower report of positive outcome expectancies. Similarly, the study indicated that the IDDM patients were younger and more often employed. And the authors argued that the IDDM patients may have been in a better position to deal with their illness.

Discussion of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences and with which that were mostly influential in the prediction of patient's optimism.

Evidence from the study of Fournier, Ridder and Bensing (2003) showed that, female IDDM patients reported lower level of optimism than male IDDM patients. More so, (Fournier et al., 2002a; Ridder et al., 2004; Fournier et al., 2003b) indicates that optimism relates with psychological health indicator (depression and Fatigue in the IDDM sample.

Surprisingly, only the studies of (Fournier et al., 2002a; 2003b; Ridder et al., 2004) have examined optimism among diabetes patients. More so, these studies compared other chronic diseases together in relation to optimistic response in the reporting of psychological illness. In addition, these studies recruited only IDDM patients. However, more research is needed that will involve NIDDM patient as to know if NIDDM patients optimistic expectancies are similarly in the reporting of psychological illness compared with the IDDM patients since the severity and duration of type1 and type 2 diabetes vary; the psychological correlates of these conditions may vary as well.

2.13. Religiousity and Spirituality

2.13.1 Theoretical Framework

Religiosity refers to the Behaviors and attitudes a person has with respect to a particular religion (e.g. Christianity, and Islam), which include Behavior such as church attendance, prayer, the reading of sacred texts, and attitude such as strength of religious belief (Sulmasy 2009). In contrast, spirituality was viewed as the aspect of humanity that refers to the way individuals seek and express meaning and purpose, and the way they experience their connectedness to the moment, to self, to others, to nature, and to the significant of sacred (Puchalski et al., 2009) a purpose of living (Wong 1998) and as an appreciation for the mystery of life (Hatch, Burg, Naberhaus & Hellmich, 1998; Mac Donald, 2000; Miller, 2004).

Alternatively, spirituality is believed to encompass that which cannot be explained within the self- or through intellectual or natural reasons alone (Lewis, 2001). However spirituality and religiosity are construed as a theoretical constructs used interchangeably in the psychological literature (Constantine, 2000). Although spirituality is commonly regarded as an individual phenomenon identified with a belief in some form of higher creational force or Supreme Being.

On the other hand, religion is most often conceptualized as the routine and pragmatic demonstrations of spirituality (Constantine, Lewis, Conner & Sanchez, 2000). In other words, religion incorporates spirituality, and reflects the manifestations of formal theological beliefs and activities (e.g., Church attendance, church affiliations or rituals / prayer).

According to Fane, (1999) religious affiliation is affected by problems of nominalism, while religious Behavior (e.g., church attendance), was contaminated by problems of personal and contextual influences. Similarly Fane (1999) postulated that religious beliefs are contaminated by a sharp division between denominational groups. In contrast to the use of religiosity related variables alone as a measure of religiousness (Kay & Francis 1996) argued that the best way to measure religiosity is to use the attitudinal dimension that will include the measure of religiosity and spirituality. Furthermore, Salsman et al., (2005) opined that since religiosity and spirituality are multidimensional constructs, it is necessary to specify exactly which dimensions are assessed in any given study and to have theoretical justification for doing so.

The current study fulfilled this obligation by using the 30 – item spiritual attitude inventory developed by combing three currently validated measures of religiosity and spirituality: Duke Religious Index (DUREL) Negative Religious coping (NRCOPE), and the Health locus of control scale (HLC).

The Theoretical Basis of Religious Effects on Wellbeing

Several reviews of the research literature over the year have reported that aspects of religious involvement are associated with desirable mental health outcomes and wellbeing (e.g., Ellison & Levin 1998; Larson et al. 1992). However, in recent times, researchers (e.g., George, Ellison & Larson, 2002; Smith, 2003) have put forward some theoretical explanations. George et al. (2002) outlined four psychological mechanisms by which religiousness can influence positive health outcomes.According to their theorem, the four ways include: (1) positive health practice; (2) social support; (3) psychological resources (e.g., self-esteem and self–efficacy) and (4) an individual's belief (sense of coherence). According to this theorem, the four mechanisms proposed, could influence numerous health and Behavioral outcomes. Smith (2003) in his theory postulated the importance of moral awareness of individuals that enables people to build a network of social relationship and social support. He further maintained that this socialization process among religious people in turn reflect on a positive health outcome.

Accordingly, Smith (2003) proposed nine factors under three headings to explain the relation between religious engagement and health outcome. According to this view, the first dimension is moral order to which is included: (1) the factors of moral directives (2) spiritual experiences and (3) role models. The second dimension is learned competencies, and this includes: (1) factors of community and leadership skills (2) coping skills, and (3) cultural capital. The last dimension in his theory is what he called the social and organizational ties such as: (1) social capital (2) network closure and (3) extra- community skills.Furthermore, he maintained that moral order which is the first dimension provides people's normative ideals about what is good and bad, right and wrong, worthy and unworthy, just and unjust which extends beyond individual desires and standards and could be used for the development of oneself and the society as a whole. As to the second order or the learned competencies, he arguedthat those identified variables could enhance people's social skills and knowledge, which are in turn contributory to their overall well-being and life chances. Finally, he argued thatthe third order which represents social and organizational ties implies thatreligious people could meet many other members in their religious communities who care and can also provide healthy guidance for them.

Alternatively, Jones (2004) outlined seven set of ways by which religiousness may exert a positive influence on health. These includes: (1) an increased relation to stress: (2) decrease in unhealthy Behaviors (3) increase in social support (4) more compliance with physicians treatment (5) a sense of coherence (6) more positive self-concept (e.g. higher self- esteem and less anxiety) and (7) the positive interaction between mental and physical well- being.Yeung and Chan (2007) undertook an extensive meta-analysis to examine the association between religiousness and well-being. According to their finding, religiousness can promote various resources including spiritual, cognitive, psychological and social resources.

Based on these arguments, the results of many studies tie religiosity/spirituality beliefs to positive health outcomes in disabled and nondisabled persons (Idler& Kasl, 1997); in people with coronary heart disease (Morris, 2001). While others indicate that spiritual well-being is associated with overall good health in persons with chronic illness (Riley et al., 1998; Bradly, Peterman, Fitchett, Mo, & Cella, 1999).Health outcomes in chronic illness also are linked with spirituality, although the research remains sparse (Craig et al., 2004). (Matthews et al., 1998) noted, from a review of the literature, that religious commitment might help people adapt to illness and facilitate recovery. Therefore, examining religiosity/spirituality may be important factor relating with the psychological health of diabetic patients in Nigeria. More so, from the reviewed of the literature below, Kelly, Hertzman and Daniel (1997) found that patient with higher religious attendance significantly reported low anxiety and stress. While in the contrary Wahyu, et al., (2013) reported a significant positive correlation between religiosity and stress that is the high the patient religiosity the high their stress. Hence, more research is needed to explore more of this variable among diabetic population.

Personal religiosity and organized religion are seen as protective factor for a person against the development of poor psychological health problems. Several study outcomes have demonstrated consistent patterns of religiosity serving as a protective factor against development of poor psychological health (e.g., Kilbourne and Cummings (2009) found a significant influence of religiosity on depression among low-income people with diabetes However, some studies did not find any significant influence of religiosity on psychological health indicators (e.g. Edmondson et al., 2015; Morse et al., 2000; Miller, McConnell & Klinger, 2007). Nonetheless, some studies have also demonstrated the negative impact of religiosity/spirituality on psychological health outcomes (e.g. Baetz et al., 2006; Park, Hong, Park &Cho, 2012). These contradictory findings across studies create an opportunity for more studies to be conducted to examine whether personal religious faith protect diabetic patients against poor psychological health problems or otherwise. With regards to diabetic studies in Nigeria, the few available are mainly prevalence studies that are concerned with estimation of depression in people suffering from diabetes and medical complications (e.g. Agbir, 2010; James et al., 2010; Igwe , 2013), with no such studies addressing the religious belief that are likely to potentiate poor psychological health in diabetic patients. In the same vine, Nigeria is known globally to be one of the most religious countries, with the percentage of (Christians 50%, Muslim 40% and 10% follows traditional beliefs). However, understanding how diabetic patients in Nigeria cope via their religious resources when they are faced with diabetes stress is lacking and this warrant being explored.

2.13.2 Studies on Religiosity and Spirituality in Diabetes

Kilbourne and Cummings (2009) examined the influence of religiosity on depression among low-income people with diabetes in a mid-sized southern city in the US and reported that religious dimensions such as endorsing religious beliefs, praying, reading religious texts, and attending religious services were all concurrently related to less depression in diabetic patients.

Wahyu, Citra, Prasetyo, Mariyana and Maylani (2013) examined illness perception, stress, religiosity, depression, social support, and self-management of diabetes in Indonesia. A total sample of (N=68) patients filled the questionnaire including the Religiosity Scale, Beck Depression Inventory (BDI), Social Support Perception scale, Self-acceptance Scale, Anxiety Scale, The Brief Illness perceptions Questionnaire (BIPQ), The Coping Styles Inventory and the Diabetes Self-Management Scale. The findings from the study showed a significant positive correlation between religiosity with stress (r: - . 69 P<. 05).

Anyfantakis, Symvoulakis, Panagiotakos, Tsetis, Castanas, Shea, Venihaki and

Lionis (2013) examined the extent of psychosocial factors, such as religiosity/ spirituality and sense of coherence, mediates the negative effects of stress on a variety of Cardio-metabolic indicators (i.e. diabetes). A total sample of (N=220) patients, completed the measure of Royal Free Interview for Spiritual and Religious Beliefs (RFI-SRB) and Sense of Coherence (SOC) Scale. The findings from the study showed inverse relationships between religiosity/spirituality and prevalence of diabetes. In addition, the study found a positive association between sense of coherence with religiosity/spirituality.

Samuel-Hodge, Watkins, Rowell and Hooten (2008) examined the coping styles, wellbeing, and self-care Behaviors among African Americans with type 2 diabetes. The findings from the study showed that church attendance related in taking less action to address the illness among people of African Americans.

Kelly, Hertzman and Daniel (1997) examine the biological pathways between stress and health among diabetes patients. The findings from the study showed that religious attendance associated with lower rates of anxiety and stress.

Samuel-Hodge, Headen, Skelly, Ingram, Keyerserling and Jackson (2000) examined the influences on day to day management of type 2 diabetes among African Americans women. The study findings indicate that African Americans women mentioned asking God for help in controlling diabetes, and when faced with difficult problems. The author reported that the patients turn it over to the Lord.

How, Ming and Chin (2011) used a cross sectional study to examine the relationships between religiosity, religion and glycaemic control of type 2 diabetes mellitus. A total sample of (N=212) patients, filled the questionnaire assessing religiosity (Beliefs and Values Scale BV). The findings from the study showed that Muslim patients had a significantly higher religiosity and better glycaemic control. Similarly, the study found that patients who had church going religions had better glycaemic control than patients of other religions.

Discussion of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences and with which that were mostly influential in the prediction of patient's religiosity.

Evidences from these studies revealed the relationships between religiosity/spirituality and psychological health among diabetes patients. However the study of Kelly, Hertzman and Daniel (1997) found that patient with higher religious attendance significantly reported low anxiety and stress. While in the contrary Wahyu, et al., (2013) reported a significant positive correlation between religiosity and stress that is the high the patient religiosity the high their stress. More so the study of Samuel-Hodge et al., (2008b) indicate, that patients who attendance church reported taking less action to address the illness. In contrast, (Samuel-Hodge et al., 2000a) found that spirituality provides support for African Americans in dealing with their diabetes. Similarly, these studies have yielded significantly and non-significant between different indicators of religiosity and a lower prevalence of psychological health indicators (e.g. depression and stress) in diabetic populations. Furthermore, few studies have examined the relationship of religiosity/spirituality indicators and psychological health from the diabetes populations. And of much concern nothing is known about how patients with diabetes are affected in terms of gender, ethnicity and diabetes types. However, more research is needed to examine the religiosity/spirituality in patients' lives when faced with diabetes and how in turn, help patient's better cope with their diabetes.

2.14. Social Support

2.14.1 Theoretical Framework

Social support refers to the aid provided by others to those facing stressful events. This include material aid, for example, financial assistance or help with daily tasks; relevant information intended to help in individual cope with current difficulties; or the opportunity for emotional expression and venting (House and Kahn, 1985). Scholars have reported that advice and encouragement as sources of support may also increase the likelihood that an individual will rely on active problem solving and information seeking; more so, these techniques may assist patients in dealing with various stressors in the environment and facilitate a positive adjustment process

(Holahan, Valentiner, & Moos 1995). Various definitions of social support given by scholars include: Shumaker and Brownell (1984) defined social support as an exchange of resources between at least two persons, aimed at increasing the well-being of the receiver.

On the other hand Siegel and Coworker (1993) define social support as the information from others that one is loved for, esteemed and valued, and part of a network of communication and mutual obligations from parents, a spouse or lover, other relatives, friends, social and community contacts such as churches or clubs, or even a devoted pet.Alternatively, Thoits (1982) presented social support as the degree to which a person’s basic social needs (affection, esteem or approval, belonging, identity, and security) are gratified through interaction with others by the provision of socio-emotional or instrumental aid.

Futhermore, Sarason et al. (1990) postulated two dimensions of social support as quality and quantity social support. They went further to describe five forms of social support as follows:

(1) **Emotional support**: This consists of sustenance of hope and assurance of security and care from others which enables the victim to believe that he/she is cared for by others (Sarason et al., 1990);

(2) **Instrumental support:** This form is also called tangible support because it involves giving something tangible such as money or time to the affected person (Wan, Jaccard & Ramey, 1996, p. 503);

(3) **Information support:** This form of support is giving mainly in form of advice and counsel, and the affected individual uses interactive opportunity to present his/her problem and would expect positive response (Sarason et al., 1990);

(4) **Network support:** This form of support refers to being a member of a group or being put in touch with a group with common interests and concerns (Saranson et al., 1990). According to Sarason et al, (1990) this is more than causal acquaintanceships or shared recreation (e.g. sickle cell group or AA groups);

(5) **Companionship support**: This form comprises of having someone honest enough to share life’s experiences with its effect is helping to distract people from their problems and provides feelings of belongingness (Wan, Jaccard & Ramey 1996, p. 502).

2.14.2 Studies on Social Support in Diabetes

Kollannoor-Samuel, Wagner, Damio, Segura-Perez, Chhabra, Vega-Lopez and Perez-Escamilla (2011) examined the socio-demographic, psychosocial, cultural, and clinical risk factors that predispose to depression, and resources that protect from depression among low income Latinos with type 2 diabetes. A total sample of (N=211) participants from a Metabolic Syndrome clinic' at Hartford Hospital's Brownstone Clinic filled the questionnaire of the Center for Epidemiological studies (CES-D) Scale, Social support scale, Multi-Dimensional Diabetes Questionnaire, Acculturation Rating Scale for Mexican American-II (ARSMA). The findings from the study showed that clinically elevated depression were found among people who identify themselves as Puerto-Ricans, lived in households with fewer members, have lower income, be unemployed, and low social support.

Garousi and Garrusi (2013) used a cross sectional study to examine the contributing factors that could be promote quality of life and the relationship between perceived family support with depression and anxiety in diabetes, South-east Iran. A total sample of (N=386) patients, filled the Diabetes Specific Family Support (DSFS), and Hospital Anxiety-Depression Scale (HADS). The findings from the study showed no relationship between the mean scores of depression and anxiety with gender. However, the study found significant relationship between duration of diabetes, educational level, and socio-economic level with depression. In addition, the study found significant relationship between subscales of family Behaviors (Supportive and non-supportive) and psychological comorbidities (depression and anxiety).

Rees, Karter and Young (2010) used a cross sectional study to examine Race/Ethnicity, Social Support and Associations with Diabetes Self-care and Clinical Outcomes in NHANES. A total sample of (N=450) participants completed the questionnaire of Patients Health Questionnaire (PHQ-9), and Social support Scales. The study found no significant association of age and gender with social support. But lower social supports were significantly associated with lower education, and depressive symptoms in type 2 diabetes. In addition, the findings indicated that social support did not differ significantly by race/ethnicity.

Sacco and Yanover (2006) examined three possible models of the interrelationship among depression, social support, and diabetes-related medical symptoms among diabetes patients at the University of South Florida Diabetes Center. A total sample of (N=86) participants filled the questionnaire of Diabetes Symptoms Checklist (DSC), Patient Health Questionnaire (PHQ-9), and the Global Support subscale of the Michigan Diabetes Research and Training Center Diabetes Care Profile (MDCP). The findings from the study showed a significant correlation between depression, and social support. That is, type 1 and type 2 diabetes scored high in depression reported low social support.

Toi, Baghbanian, Rahimi, Shojaeizadeh and Mohehhi (2011) used a cross sectional study to examine the relationship between perceived social support from family and diabetes control among patients with diabetes type 1 and type 2 at a Teaching Hospital affiliated to Tehran University of Medical Sciences. A total sample of (N=430) participants completed the questionnaire of Perceived social support scale. The study found that perceived social support and age group had significant association among 35-60 years old patients with type 2 diabetes. However, the study found no significant association between age and social support in patients with type 1 diabetes. In addition, the study found a significant association between perceived social support and gender of males with both types of diabetes. However, other analysis indicated that perceived social support were higher associated for married patients with type 2 diabetes. Conversely, perceived social support were higher among type 2 diabetic patients with lower education than diploma, but no significant association between education and marital status and perceived social support among type 1 diabetic patients. Similarly, the authors reported no significant association between disease duration and perceived social support among type 1 and type 2 diabetes patients.

Nefs, Pouwer, Pop and Denollet (2012) examined Type D (distressed) personality and it correlates with the DS14 assessment in primary care patients with type 2 diabetes. A total sample of (N=103) participants completed the Dutch version of the Edinburgh Depression Scale (EDS), The DS14 measures and the O’Hara’s modified social support scale. The findings from the study showed that Type D female who reported less social support and more stressful life events had more depressive mood and anxiety.

Malik and Koot (2009) examined the role of diabetes-specific and psychosocial factors in the adjustment of Adolescents with type 1 Diabetes from 25 Hospitals in the Netherlands. A sample total of (N=437) participants completed the items including the Modified Diabetes Quality of Life, Satisfaction with Life, Well-Being Questionnaire, Psychopathology Child Behavior Checklist, Modified Diabetes Specific Support Questionnaire (MDSSQ), global self-worth subscale, and Social support Scale. The results from the study showed that global self-worth and general social support accounted for an increase of 25.7% variance explained in diabetes quality of life; and global self-worth and general social support accounted for an increase of 32.6% variance explained in general welling, and finally global self-worth, general social support, tangible support accounted for an increase of 28.5% variance explained in psychopathology. In addition, the study showed a positive correlation between tangible support and psychopathology (r = 0. 16, P =0.05, or r = 0.17, P= 0.05) for females and males respectively. However, the authors reported that demographic and age correlated with tangible support for males and females.

Collins –McNeil (2006) used a cross sectional, descriptive- correlational study to examine the ability of anxiety, depressive symptoms, and perceived social support to predict cardiovascular disease (CVD) risk in African American adults with type 2 diabetes. A total sample of (N=57) participants filled the State-Trait Anxiety Inventory , Center for Epidemiological Studies Depression Scale (CES-D), and Medical Outcome Survey Social support Questionnaire (MOS-SSQ). The findings from the study showed a correlation between perceived social support and trait anxiety. But no significant relationships were found between age, gender, marital status, and social support or any of the study variables.

Skinner, John and Hampson (2000) used a longitudinal study to examined social support and personal models of diabetes as predictors of self-care and Well-Being of Adolescents with Diabetes. A total sample of (N=42) participants completed the questionnaire of Well-being Questionnaire, Diabetes Self-Care Schedule, perceived Social Support, Family Behavior Checklist (DFBC), Diabetes Inventory of Peer Support (DIPS) and Personal Models of Diabetes Questionnaire. The study found a significant gender differences. That is, females reported higher depression, anxiety lower level of positive well-being and overall wellbeing than males. Similarly females reported to have more social support from friends than males.

Discussion of the Findings

The findings are discussed with reference to the aims of the study in terms of Gender, Ethnicity and Type of diabetes differences and with which that were mostly influential in the prediction of patient's social support.

The studies of Rees, Karter and Young (2010) reported that social support significantly differ by type of diabetes, that is, patients with type 2 diabetes were had more social support than patients with type 1. However, this is contrary to the studies of Sacco and Yanover (2006) were social support did not differ significantly between type 1 and type 2 diabetes. Consequently, in terms of social support, the reviewed studies showed contradictory results; there were no main effect of gender on social support. For instance the studies of (Collins – McNeil 2006; Rees, Karter and Young 2010; Malik and Koot 2009) reported that gender is not a significant factor on patients' perceived social support. However, Rees, Karter and Young (2010) reported similar findings for social support and ethnicity. Additionally, on the contrast, (Toi, et al., 2011; Skinner, John and Hampson 2000; Skinner, John and Hampson 2000) found a significant interaction between gender with types of diabetes on perceived social support. However, gender and type of diabetes interaction on social support indicated to be the mostly influential and this current study will re-examine further the interaction between gender and type of diabetes on social support within the Nigerian context.

2.15 Chpater Summary

In summary, this chapter considered all the variables covered in the current study and the literature reviewrevealed conflicting findings in the direction of association between many variables, providing a clear justification for their inclusion in this study.

CHAPTER THREE

MIXED METHODS RESEARCH DESIGN

3.0 Introduction

The literature review provided evidence supporting the current study on the socio-cognitive and psychological health of diabetic patients in Nigeria. The few studies that have examined the psychological health of diabetic populations in Nigeria, have only concentrated on one or two psychological health constructs; there is no available study that has examined the broader pattern of socio-cognitive responses of diabetic patients. This chapter presents the philosophical and theoretical underpinning of mixed methods methodology and its relevance to health care research and in particular, Health Psychology, providing justification for this methodological choice. The study design and sampling strategies are then discussed, including the identification of potential challenges associated with mixed method research design and how these have been addressed in this study. Finally, the key features of the research design are summarised.

3.1 Methodology

It is recognised that assumptions concerning what can be investigated about the world vary widely (Gomm. 2008).This is because research is non-neutral in that it commonly serves certain interests over others (Devine and Health, 1999). As such, the “need-based or contingency approach” (Johnson & Onwuegbuzie, 2004, p. 17) was used to determine the approach for this study. According to Greene and Caracelli (1997) the contingency approach is formed on the basis that one method of inquiry is unlikely to provide multiple explanations and instead, “a method’s usefulness depends on the contextual circumstances” (p. 63) surrounding the specific topic of interest. In other words, the“needs-based or contingency approach” to research of this kind frees researchers to “create designs that effectively answer their research questions” instead of following “completely either the qualitative or quantitative paradigm” (Johnson & Onwuegbuzie, 2004, p. 20). However, the term ‘qualitative’ implies making an assessment or judgment that involves interpretation, which might therefore be applied to both certain types of data (those that involve making judgment) and interpretive analysis, with the latter typically involving text or other non-numerical material but potentially also numerical data or statistical output.

On the other hand, the term ‘quantitative’ implies something that can be quantified or measured, and in that sense, it might be applied to those things that involve counting such as numerical data and the use of some statistical procedure (Tashakkori & Teddlie 2003 p. 389).

Thus, this cross-sectional two phase (sequential) explanatory study utilized mixed methods methodology with a “pragmatic approach” (Morgan, 2007, p. 48). That is, “pragmatism” is the “philosophical approach” and “mixed methods” is the methodological strategy that results from the view of pragmatism that “knowledge is both constructed and based on the reality of the world’s we experience and live in” (Johnson & Onwuegbuzie, 2004, p. 18). However, to meet the stated aims and research questions and the need for academic rigour and originality, it was determined that a mixed method approach would provide a greater and accurate understanding of the phenomenon of interest than the use of a single method.

A general consensus definition of Mixed Methods Methodology is that mixed method is the type of research in which a researcher or team of researchers combine elements of qualitative and quantitative approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the purpose of breadth and depth of understanding and corroboration” Johnson et al. (2007). A fundamental principle of mixed methods research is that multiple data is collected using a mixture of different strategies, approaches and methods to produce a research process where strengths are balanced and weaknesses are minimized (Johnson & Onwuegbuzie, 2004). According to Johnson and Onwuegbuzie, effective use of this principle is a major source of justification for mixed methods research because the study will have greater strength than if conducted with a single method. Moreover, Twinn (2003) asserts that this methodology has particular relevance when there is need to expand our understanding of complex health Behaviors and that the research question is most important and should guide the use of a particular approach to the problem of the study. In particular, a mixed methods methodological approach employing the use of both quantitative and qualitative methods ensures that perceptions of participants are comprehensively honoured.

Mixed methods methodology is an approach to knowledge derived from theory and practice, and it is commonly partnered with a pragmatic approach, and attempts to take into account multiple stances, perspectives, position and research approaches (Johnson, 2008). Furthermore, Johnson and Onwuegbuzie (2004) opined that a key feature of mixed methods research is "methodological pluralism or eclecticism" (p. 14). According to Sandelowski, (2002) it is the explicit framing of two or more paradigms or worldviews with each remaining distinct from the other providing "an axiomatic bridge between epistemological tensions". Also, Johnson (2008) states that dichotomizing the world is not going to solve our difficulties; yet listening and learning from the tensions produced by poles can advance our thinking" (p. 204). Paradigms present philosophical assumptions by describing a preference for a "trilogy of concepts from the philosophy of knowledge" (Morgan, 2007, p. 57). As described by Holloway and Wheeler (2010), this trilogy of concepts relate to distinctions regarding to ontology (the nature of being, the reality or existence), epistemology (the theory of knowledge), methodology (the framework of theories and principles guiding inquiry purposes, questions and logic) and axiomatology (value laden or value free). However, Kuhn, (1977), Morgan (2007), refer to four versions of paradigms emphasising that they are not necessarily mutually exclusive: 1) paradigms as world views, 2) paradigms as epistemological stances, 3) paradigms as shared research beliefs among members of a specialty area, and 4) paradigms as model examples of research. Paradigms as world views is considered to be the broadest version, conversely, paradigms as epistemological stances appears to be the most widespread version utilised in social science research methodology. However, the current study adopted paradigms as epistemological stances.

Greene and Caraceli (2003) stress that "paradigms are social constructions, historically and culturally embedded discourse practices, and therefore neither inviolate nor unchanging" (p. 95). Within social sciences research literature, the major paradigms as epistemological stances have been identified; positivism, subjectivity and constructivism-from which research methodologies and methods emerge. For the following discussion the researcher identified two major competing epistemologies- positivism and constructivism – acknowledging subjectivity as a critical element of constructivism and positivism which also acknowledged the objectivity approach of the postivists. However, both have potential relevance in data collection, analysis and interpretation of the results of the current study investigation.

3.2 Opposing Paradigms: Positivism and Constructivism

A research approach is assumed to encompass the whole design, including the researchers' assumptions, the process of inquiry, the type of data collected and the meaning of the findings (Parahoo 2006p.49). It is very important for a researcher that he/she established from the onset the research approach adopted for his/her study. Ideally, the research approach may fall between quantitative deductivism and qualitative inductivism (Parahoo 2006, p48; Polit and Hungler 1995 p.12). Although Cormack (2000) argues that some studies may be exclusively quantitative or qualitative, while others may effectively combine these approaches that is (mixed methods).Guba & Lincoln developed a system for comparing different "paradigms" in social science research through a familiar trilogy of concepts from the philosophy of knowledge: ontology, epistemology, and methodology. Their early comparisons (Lincoln & Guba, 1985, 1988) were between positivism and a competing paradigm they called "naturalistic inquiry," which became better known as constructivism (and occasionally interpretivism).

Positivism and constructivism paradigms have four distinguishable research assumptions (Ontological, Epistemological, Methodological and Axiomatic) in terms of the ways in which they respond to basic philosophical questions (Polit and Hungler 1995 9.10, Dempsey P A and Dempsey A.D 2000 P.27; Cormack 2000 P. 143-146). The positivism stance values realism, deduction, objectivity, reductionism, and generality, while constructivism values relativism, induction, subjectivity, holism and context. Central to positivism is deductive logic, the aim to discover and confirm relationships (Davidson & Tolich, 1999). Underlying the positivist approach is reductionism, the assumption that the world may be understood by studying the parts of a bigger picture in isolation of the social context. The constructivist paradigm in contrast is underpinned by an analysis of socially meaningful Behavior in a systematic way to understand how individuals interact with their social world (Davidson & Tolich, 1999). In other words, constructivism attempts to provide an understanding of the world within its context. From these two competing paradigms emerge related methodological approaches to research.

The quantitative paradigm is based on positivist beliefs including that researchers are able to be objective and that variables can be precisely measured (Holloway &

Wheeler, 2010). As quantitative methods are traditionally underpinned by deductive logic; they seek consensus and norms or patterns that can be generalized to predict Behaviors. All science is characterized by empirical research; all phenomena can be reduced to empirical indicators which represent the truth. The ontological position of the quantitative paradigm is that there is only one truth, an objective reality that exists independent of human perception. Epistemologically, the investigator and investigated are independent entities. Therefore, the investigator is capable of studying a phenomenon without influencing it or being influenced by it; "inquiry takes place as through a one way mirror" (Guba and Lincoln, 1994: 110). The goal is to measure and analyze relationships between variables within a value-free framework (Denzin and Lincoln, 1994). Techniques to ensure this includes highly structured protocols, and written or orally administered questionnaires with a limited range of predetermined responses. Sample sizes are much larger than those used in qualitative research so that statistical methods to ensure that samples are representative can be used (Carey, 1993).

In contrast, the qualitative paradigm is based on interpretivism (Altheide and Johnson, 1994; Kuzel and Like, 1991; Secker et al., 1995) and constructivism (Guba and Lincoln, 1994). Ontologically speaking, there are multiple realities or multiple truths based on one's construction of reality. Reality is socially constructed (Berger and Luckmann, 1966) and so is constantly changing. On an epistemological level, there is no access to reality independent of our minds, no external referent by which to compare claims of truth (Smith, 1983). The investigator and the object of study are interactively linked so that findings are mutually created within the context of the situation which shapes the inquiry (Guba and Lincoln, 1994; Denzin and Lincoln, 1994). This suggests that reality has no existence prior to the activity of investigation, and reality ceases to exist when we no longer focus on it (Smith, 1983). The emphasis of qualitative research is on process and meanings. Techniques used in qualitative studies include in-depth and focus group interviews and participant observation. Samples are not meant to represent large populations. Rather, small, purposeful samples of articulate respondents are used because they can provide important information about the contextural phenomena of the study, not because they are representative of a larger group (Reid, 1996).

3.3 Rationale for the Mixed Methods Approach: Pragmatism

One paradigm should not be privileged over other and both may be necessary for understanding complex issue. In regard to the concerns of the current investigation, to fully understand the complex nature of people (living with diabetes) requires such a complementary nature of research paradigms; Creswell (1994) suggested mixing paradigms and Maxwell (2004) argues that no single paradigm or methodological approach can provide a full understanding of the complexity of human Behavior required in a health care setting.

Although it is recognised that the research approach adopted depends on a number of factors including the nature of the phenomena to be investigated, the aim of the research, and the state of existing knowledge (Cormack 2000 p.165). The current study is exclusively based on the mixed method approach, on the basis that the current study explores the association between numerous variables and further seeks explanatory questions about how that predicted (or some other related) relationship and differences actually happened by employing both objective and subjective methods of data collection. In other words the first being the collection and analysis of quantitative data and the second being further the exploration of the life experiences of diabetic patients so as to provide a more comprehensive understanding of the phenomena of the study.

With consideration for the complexity of human, health and illness, Morgan (2007) presents an argument for Khun's (1977) regarding the third and preferred version of paradigm to be more appropriate within the social science research field, that is , paradigms as shared research beliefs among members of a specialty area. Johnson, Onwuegbuzie, and Turner (2007) concur by describing a research paradigm as a "set of beliefs, values and assumptions that a community of researchers has in common regarding the nature and conduct of research" (p.24). This idea is further supported by Denscombe (2008) who argues for the use of "communities of practice" (p.270) as basis for a research paradigm that allows for diversity while being consistent with the philosophical underpinnings of pragmatism.

As previously mentioned mixed methods methodology connects with the philosophy of pragmatism (Denscombe, 2008; Maxcy, 2003; Teddlie & Tashakkori, 2003). The primary philosophy of pragmatism it that, "knowledge is viewed as both constructed and based on the reality of the world's we experience and live in" (Johnson &

Onwuegbuzie, 2004, p. 18). Pragmatism is considered to offer an outcome focused and practical method of inquiry (Johnson & Onwuegbuzie, 2004) and is often presented as the "third methodological movement" (Tashakkori & Teddlie, 2003, p. ix) or more commonly as the third research paradigm (Johnson & Onwuegbuzie, 2004; Johnson, 2008).

The expansion in research approach that is mixed method has led to conflicts about ontological, epistemological and methodological validity. As reported in Creswell and Tashakkkori (2007), Howe (1988) posited the 'incompatibility thesis', stating that quantitative and qualitative research approaches and their methods, cannot and should not be used together as they are traditionally associated with two distinct paradigms that are not compatible with each other. According to Symonds and Gorard (2008), theorist utilising quantitative and qualitative research approaches as mono-methods were not convinced that different types of data could support each other or "that methods other than their own could provide a coherent version of reality" (p. 2). However, along with many others in the mixed methods research community, Johnson and Onwuegbuzie (2004) advocate for the "rejection of the in compatibilist, either/ or approach to paradigm selection and recommend a more pluralistic or compatibilist approach (p. 19). In support of this stance, Feilizer (2010) states that when pragmatism is considered as an alternative paradigm or approach it " sidesteps the contentious issues of truth and reality, accepts philosophically, that there are singular and multiple realities that are open to empirical inquiry and orients itself towards solving practical problems in the real world" (p. 8). Guba and Lincoln (2005) argued that it is possible to combine qualitative and quantitative methods, similarly, in another development there are several viewpoints as to why qualitative and quantitative methods can be combined in a single study. First, the two approaches can be combined because they share the goal of understanding the world in which we live (Haase and Myers, 1988). King et al. (1994) claim that both qualitative and quantitative research shares a unified logic and that the same rules of inference apply to both. For instance, the quantitative method uses generalizability while the qualiataive method uses transferability for inference of finding to each respective population for which sample was taken.

Secondly, the two paradigms are thought to be compatible because they share the tenets of theory-ladenness of facts, fallibility of knowledge, indetermination of theory by fact, and a value-ladened inquiry process. They are also united by a shared commitment to understanding and improving the human condition, a common goal of disseminating knowledge for practical use, and a shared commitment for rigor, conscientiousness, and critique in the research process (Reichardt and Rallis, 1994). In fact, Casebeer and Verhoef (1997) argues that we should view the combination of both qualitative and quantitative methods (mixed methods) as part of a continuum research that is, undertaking a quantitative data collection and then follow up the results with a qualitative data rather than a replacement for both with specific techniques selected based on the research objective.

Thirdly, as noted by Clarke and Yaros (1988), combining research methods is useful in some areas of research of relevance to the current project, such as health psychology, because the complexity of phenomena requires data from large number of perspectives. Similarly, some researchers have argued that the complexities of most public health problem (Baum, 1995) or social interventions, such as health education and health promotion programs (Steckler et al., 1992), requires the use of a broad spectrum of qualitative and quantitative methods. Furthermore, Meyer (2005) offers an example of this in connection with health research in the UK. She describes how health researchers have been officially encouraged to mix their method. Giddings (2006) makes a similar point with respect to nursing research; she argued that the inclusion of qualitative research has occurred only to the extent that it meets a post-positivist research agenda in which the aim of combining the use of quantitative and qualitative methods is to get more ‘accurate’ results. An interesting argument has been made by Howe (1988) who suggests that researchers should forge ahead with what works. Truth, he states, is a normative concept, like “good” Truth is what works. This appears to be the prevalent attitude in mixed-methods research. Howe’s argument seems to suggest that only pragmatists, or those not wedded to either paradigm, would attempts to combine research methods across paradigm. In other worlds the pragmatic approach draws on employing “what works”, using diverse approaches, giving primacy to the importance of the research problem and question, and valuing both objective and subjective knowledge (Morgan 2007). For the reasons outlined above, the theoretical perspective that is of most value for, and underpinned the current study is pragmatism which aims to address the research problem and question by exploring the extent of relationship between socio-cognitive factors and psychological health of diabetic patients and further examine how that predicted (or some other related) relationship and differences actually happened. Therefore, it would be expected that if the aforementioned objective of the current study is to be achieved, the theoretical perspective of choice suitable for the study would be pragmatism.

However, with the view that paradigm consists of shared research beliefs among members of a speciality area Morgan (2007), recommends the term “pragmatic approach” be used, as opposed to pragmatic paradigm, refocusing on “methodological rather than metaphysical concerns” (p. 48) That is, the methodology (driven by research question) is the “primary determinant of both epistemology and methods” Bazeley, 2009, p. 88). To summarise the key points, pragmatism and mixed methods research reject the incompatibility of quantitative and qualitative method, consider the research question as the primary determinant of methods and methodology, embrace both points of view from constructivism and positivism, avoid the use of metaphysical concepts (e. g) ontology) and present a “very practical and applied research philosophy” (Teddlie & Tashakkori, 2003, p. 21).More so, pragmatism avoids the top down approach of ontological assumptions about the nature of reality, which in turn imposed constraints on any subsequent epistemological assumptions about the nature of knowledge (Gube & Lincolin, 2005; Morgan, 2007), but rather holds a position of the world as it can be measured, as relating “more closely to an “existential reality”- different elements or layers- some objective, some subjective and some a mixture of the two” (Morgan, 2007, p. 8).
Greene, Caracelli, and Graham (1989) inductively identified five broad purposes or rationales of mixed methodological studies which still operates and in contemporary mixed methods literature. These are: triangulation where the purpose is seeking convergence and corroboration of results from different methods studying the same phenomenon), complementarity (where the purpose is seeking elaboration, enhancement, illustration, clarification of the results from one method with results from the other method), development (where the purpose is utilising the results from one method to help inform the other method), initiation (where the purpose is discovering paradoxes and contradictions that lead to a reframing of the research question), and expansion (where the purpose is seeking to expand the breadth and range of inquiry by using different methods for different inquiry components).

However, a two-phase, sequential mixed methodological approach was utilised specifically to provide a fuller understanding through complementary and expansion.

3.4 Methodological Mapping

As earlier discussed, mixed methods methodology underpinned by the pragmatic approach concentrate on methodology that connects the issues at the abstract level of epistemology and actual methods rather than separating our thoughts about the nature of knowledge from our efforts to produce it (Morgan, 2007).

In addition, Morgan proposes a framework for the three methodological choices that are central to the kinds of research purposes researchers pursue and the procedures utilised in that pursuit. These are: the connection of theory and data; the relationship to the research process; and inferences to be obtained from the data. These are presented in the table 3.1and discussed as follows in regard to the current research.

Table 3.1: **A Pragmatic Alternative to the Key Issues in Social Science Research Methodology (Morgan, 2007, p. 71.**

	Quantitative	**Qualitative**	**Pragmatic**
Connection of Theory and Data	Deductive	Inductive	Abductive
Relationship to Research process	Objectivity	Subjectivity	Inter-subjectivity
Inference From data	Generality	Context	Transferability

3.4.1 Connection of Theory and Data

Morgan argues that the distinction between induction (discovery of patterns) and deduction (testing of theories and hypotheses) as a way of connecting theory and data is virtually impossible in reality to operationalizes as the “actual process of moving between theory and data never operates in only one direction” (p. 70). Rather he suggests that by abductive reasoning (moving ‘‘back and forth’’ between induction and deduction) one can convert observations into theories and then assess those theories through actionMorgan (2007, p. 71). According to Feilzer, (2010) abductive reasoning refers to the “logical connection made by researcher between data and theory, often used for theorising about findings” (p. 10). As such the logic of inquiry with mixed methodology includes the use of induction, deduction, and abduction (uncovering and relying on the best set of explanations for the understanding one's results" (Johnson & Onwuegbuzie, 2004. p. 17). One of the most common uses of abduction is within sequential designs, as used in this current study, where the results of one study inform the inquiry in the second study. The use of abduction facilitates the interpretation of the data from multidimensional perspective, each data set informed, questioned, and enhanced by the others (Feilzer 2010, p. 12).

3.4.2 Relationship to Research Process

The second methodological choice is determining the relationship between the researcher and the research process. Morgan argues that the "usual forced dichotomy between subjective and objective is an equally artificial summary of the relationship between the researcher and the research process" (p. 71). Furthermore, Muncey (2009) states that the "false dichotomy between subjectivity and objectivity may not provide the best evidence" (p. 23). Instead, the emphasis on an intersubjective approach pragmatically captures the duality of working between the objective and subjective. Intersubjectivity represents the pragmatic response to incommensurability, or divergence, of ontological stances- in the pragmatic approach the researcher is comfortable with understanding both a single reality and one that is determined by multiple interpretations. And so, intersubjective is relevant in the present study as it enables the linkage between subjective and objectiveapproach.

3.4.3 Inference from Data

The final methodological choice is to rise above the distinction between qualitative research findings which are considered to be "specific and context-dependent" (Morgan, 2007, p. 72), and quantitative research findings which are considered to be "universal and generalised" (Morgan, p. 72). According to Morgan, pragmatism rejects the need to choose between the extremes of context or generality but rather advocates transferability. Morgan borrowed the concept of transferability from Lincoln & Guba (1985) who considered the question of whether what is learned in one context can be relevant in another context as an empirical issue. However, in his use of transferability, Morgan has a subtle but important points of difference by stating that it cannot be simply assumed "that our methods and our approach to research make our results either context bound or generalizable: instead, we need to investigate the factors that affect whether the knowledge we gain can be transferred to other settings" (Morgan, 2007, p. 72). In this context, transferability requires a process of working back and forth between specific results and their more general implications. This approach pragmatically focuses on the degree to which the application of leanings from one type of method in one particular setting can be made with the best utilisation of that knowledge in other settings. And so, the current study design is suitable for transferability of the findings across other setting as both the quantitative and qualitative stance adhered to the logical rule and process that govern both methods in term of replication and generalizability.

However, while promoting a more flexible pragmatic to approach, Morgan does not support total abandon from conducting research using only qualitative or quantitative research methodological approaches, but rather suggests that problems occur when these two methodological choices are treated as absolute and defining characteristics for these two different research approaches. These problems are worsened when we deny the possibility of working back and forth between the two positions. Therefore, the pragmatic approach offers an alternative methodological approach with a pluralistic view on the abductive, intersubjective and transferability aspects of research.

3.5 Mixed Methods Methodology and Health Care /Research Teams

The delivery of health services and the research communities within health encompass a broad range of disciplines for example; Medicine, Public health Nursing, Psychology, health promoters, and other professions allied to health. The majority of health professionals function within multidisciplinary teams each with their different "history, value set, and preference for addressing different types of research question" (O' Cathain, 2009.p. 3). In view of Kuhn's Model that serve as "examplars"for how research is done in a given field is based on a set of beliefs, value and specific paradigmatic assumptions, each discipline has a frame for what kinds of knowledge are valued and their relevance to application in practice (Harvey, 2014).

According to Muncey (2009) the Biomedical model that is based on the Carestian philosophy of the body as a machine is one of the most protruding models of disease in the western hemisphere (p. 25). Therefore, scientific methods have dominated in health care research. However, the researcher views are inseparable with the field of science and within its framework; rigor and objectivity are required in applying research to discover cause and effect relationships that can predict future outcomes based on present Behaviors. But, restricting research to one paradigm does an injustice to the entire field of study. Health care in general and health psychology specifically, are not purely hard sciences where immutable, objective truths exist. However, at the heart of practice in health care is the study of human bahavior and the impact that science may have on the human being as an individual within society and vice versa. While evidence-based practice is, and should be, valued by the profession, evidence is incomplete unless voice is given to the range of evidence needed to fully understand the complexity of the relationship with the patients.

In view of this, Leddy and Pepper (1998) state "the notion that one paradigm is not acceptable to sciences, particularly to health psychology, which deals with human beings and complex health/illness situations" (p.74). In a workshop held in Czech Republic 2012 by the association of health psychologists, it was agreed that Health Psychology research is primed for mixed methods approach because of the need to understand things at both the individual and the population level for it to be considered valid evidence that might be used to inform policy and practice (Hacklova 2013). In addition, Muncey (2009) opines that it would seem that utilising and mixing methods appropriately would provide a "sophisticated range of evidence on which to based practice".

At a practical level, the health psychologist is concerned with the Behavior and experience of the individual, the interface of the individual with the health-care system, and with society as a whole (Marks et al., 2010, p. 12). Health psychology provides a holistic perspective to health. It takes into account not only a person's physical illness and symptoms, but also their life experience. According to Withrow, in (Uyemura, 2011) this means that patients should be seen in context, not mainly on the physical, or emotional aspect alone but as well their social relationships in terms of how much support they have, and their community as to understand the whole entity of the individual.

On the other hand, Margaret (2005) noted that human Behavior cannot be fragmented into a few distinct variables for study. Of equal importance are the processes that connect these variables to the outcomes under study, that context cannot be negated as each human being is unique in respect to historic, ethnic, cultural, social, economic, racial, political, and gender background. Also Margaret further explains that two patients of the same diagnosis may react quite differently to health care provided based on their backgrounds as their understanding of the situation is uniquely constructed. Based on Margaret's explanation, understanding the meaning that participants make of their experiences along with their values, belief, and intentions are of equal values in health research as it attempts to gain an accurate picture since human beings are very complex phenomenon, requiring a pluralist worldview. Therefore, to approach any research dealing with human beings from a singular perspective is to limit the depth of understanding what one could have achieved.

A mixed methods methodological approach holds high regard for the acceptance of difference and the diversity of perspectives. Greene and Caracelli (2003), state that "the complexity and the pluralism of our contemporary world demands such a commitment" (p. 95). This commitment is compatible with the holistic view of the discipline of health psychology which focuses on the interface between biology, Behavior, and social context (Fava & Sonino, 2008). It is also compatible with Johnson's (2008) view that rather than dichotomising the world, we should listen and learn from tensions produced from opposing poles. Therefore the mixed method methodological approach, with its methodological pluralism (Johnson & Onwuegbuzie, 2004), fits comfortably within the philosophy of the discipline of health psychology and other disciplines within health and is considered to be justified in this study on the pragmatic bases than the ideological grounds, because the researcher engages into the complexity of health, health care, and the environment inwhich the study will take place (O' Cathain, 2009, p.4).

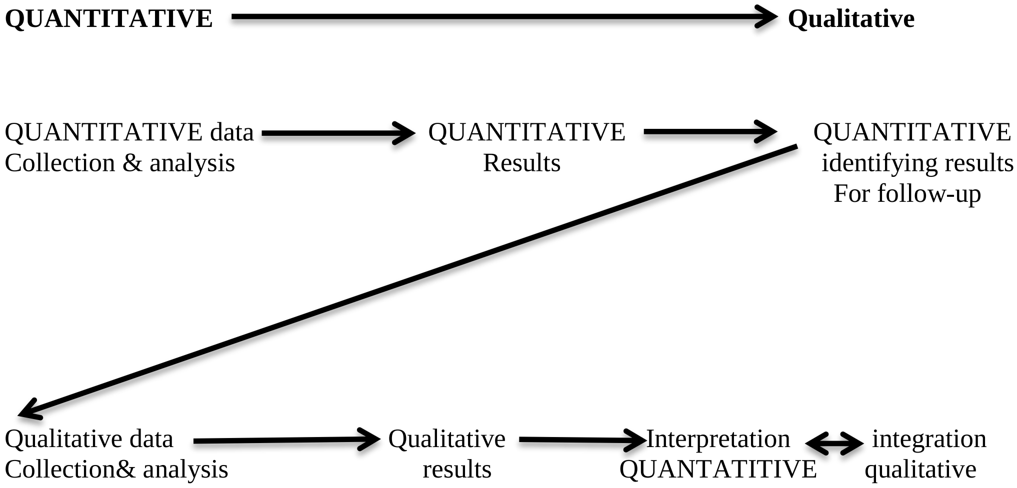
As previously discussed Greene et al. (1989) inductively identified five broad purposes of mixed methodological studies which still stand in contemporary mixed methods literature, and two of these are especially relevant to the current investigation. These are: complementary (to provide elaboration, enhancement, illustration and clarification) and expansion (to expand breadth and range of inquiry by using different methods for the overall research aims and questions, provides sound justification for the use of mixed methods methodology and guide the selection of an appropriate study design).

3.6 Study Design

This study was conducted utilising a sequential (two-phase) Mixed Explanatory Design (Creswell et al., 2003): thatis qualitative data will be used to help explain or build upon quantitative findings (Creswell & Plano Clark, 2007). Within this design, two phases of the study occur chronologically with questions for the second phase of the study emerging from the findings from the first phase of the study with data analysis always beginning before all the data are collected (Onwuegbuzie & Leech, 2004). Priority can be given to either quantitative or qualitative data or equal status to both, and the two methods are integrated during the interpretation phase (Creswell, 2009). According to Creswell and Plano Clark (2007), the explanatory Mixed Sequential design has two variants: the "Follow up Explanation Model" and the "Participant Selection Model". Both of these models have an initial quantitative data collection phase, but they differ in the connection of the two phases and the relative priority placed on the two phases. The follow up explanations model places priority on quantitative component, whereas the participant selection model prioritises the qualitative component.

This study first collected quantitative data and then followed up with a qualitative data as showed in Figure 3.1, in other words a follow up explanation model was employed with priority placed on the quantitative data. The purpose of the qualitative data is to provide an in-depth contextual understanding of ethnic, gender and type of diabetes variance in relation with patient's socio-cognitive factors and psychological health.

***Figure 3.1:* The follow-up explanations model Adapted from Creswell and Plano Clark (2007, p. 73).**



The current study will use the flow of sequence in Figure 3.1 above. The inter-relationships between constructs will be then explored utilising statistical testing. That data will be then utilised to guide purposeful sampling, to focus information seeking (to enhance in-depth understanding) and then suggest analytical paths for qualitative phase of the study (Sandelowski, 2002). In the second phase, qualitative interview (focus group) will be used to probe statistically significant, quantitative results by exploring aspects of differences of participants who took part in the quantitative phase.

One of the main strengths of the sequential design employed in the current investigation is its straightforward nature with clear stages, providing ease of implementation and reporting. The main weakness of the design can be the length of time involved in collecting data (Creswell, 2009). Nevertheless, the sequential design is considered to have particular relevance when there is need to expand our understanding of complex health Behaviors with the purpose of developing appropriate interventions to meet identified health needs (Twinn, 2003).

3.7 Challenges to Mixed Method Study Designs

Collins, Onwuegbuzuie and Jiao (2007) suggested that at least four challenges to mixed methods research should be considered when determining the study design. They are Representation, Legitimation, Integration and Politics. An ideal study design is one that addresses the research aims and research questions and enables the researcher to concurrently attend to these four challenges as effectively as possible

(Onwuegbuzie & Collins, 2007). However, each of these challenges is discussed below with explanations of how they have been met in this study.

Representation: refers to the difficulty in capturing (representing) live experiences using text in general, words and numbers. The challenge of representation is often increased in mixed methods research because the elements of both quantitative and qualitative bring to the study their unique challenges. The challenge of representation was minimised in this study by employing a sequential mixed explanatory design enabling the data to be collected and analysed separately in a separate stages and in a way that a full accurate and representative description of the variables of interest could be presented for both the qualitative textual statement and quantitative collective factors of the participants and rigour for each type of data analysis could be assured. That is, meta-references will not be made as participants were not identical in both parts of the study, but rather findings from both parts of the study have been analysed separately and then integrated during the interpretation phase.

Legitimation or Validation: It refers to the difficulty in obtaining findings and for making inferences that are deemed credible, trustworthy, dependable, transferable and/or confirmable by the consumers of the research (Giddings & Grant, 2009). Readers of purely quantitative research will assess for reliability, and validity (internal, external, construct, content, predictive), whereas readers of qualitative research will seek credibility, relevance, applicability, fairness and trustworthiness (Buetow, 2007). Because the utilisation of quantitative and qualitative methods in the same study aims to combine strengths of each method and then minimise the weaknesses, the assessment of validity of study findings can be complex (Onwuegbuzie & Johnson, 2006). Moreover, since the consumers of this research have similar characteristics (i.e. teaching hospitals), their assessment of the quality and validity is presumed to be the same criteria. Onwuegbuzie and Johnson, (2006) noted that "some qualitative researchers view the concept of validity (and the word) as representing a debunked modernist perspective that champions universal rationality, rules, order, logic and the like" (p. 55). This, it is considered counterproductive to use the word validity in mixed methods research.

Therefore, in regards to this Teddlie and Tashakkori (2003), and Tashakkori and Teddlie, 2006) have proposed an alternative framework for assessing the overall quality of mixed methods studies recommending 'legitimation' to be used as a more inclusive and descriptive term. In addition, the typology of legitimation as described above was applied as an overall assessment of quality for this present study.

Intergration: The third challenge in mixed methods research compels mixed methods researchers to ask questions such as: Is it appropriate to triangulate, expand, compare, or consolidate quantitative data originating from a large, random sample with qualitative data arising from a small, purposive sample? How much weight should researchers and/or consumers place on qualitative data compared to quantitative data? However the issue regarding the integration of both quantitative and qualitative data was addressed because the current study followed vividly the mixed method design that is suitable in terms of the flow of the sequence. The mixed methods methodology was chosen in this study to fulfil the research aims and questions by providing complementarity and expansion of the findings. The use of a sequential mixed explanatory design enabled the collection of different types of data, with the quantitative findings utilised to inform the focus for data collection and analytical probing during qualitative data collection and analytical phases. The data from both quantitative and qualitative analyses have been integrated appropriately in the interpretation/discussion phase consistent with the sequential mixed explanatory design.

Politics: refers to the tensions that come to the fore as a result of combining qualitative and quantitative approaches (Greene & Caracelli, 1997). These tensions include any conflicts that occur when different investigators are used for the qualitative and quantitative components of an investigation, as well as the contradictions and paradoxes that come to the fore when qualitative and quantitative data are compared and contrasted. These tensions and conflicts have been minimised by conducting the study in a way that the assumptions and belief inherent in both methods have been explicit and honoured and the research questions guide the data collection and the subsequent quantitative and qualitative data have been utilised conscientiously to seek complementarity and expansion of understandings of the constructs of interest. The challenge of politics also pertains to the difficulty in persuading the consumers of mixed methods research, including stakeholders and policy makers, to value the findings stemming from both the qualitative and quantitative phases of a study. However, this may not be a barrier to the consumers targeted for this study because the entire field of health psychology faviors mixing methods.

3.8 Population and Sample

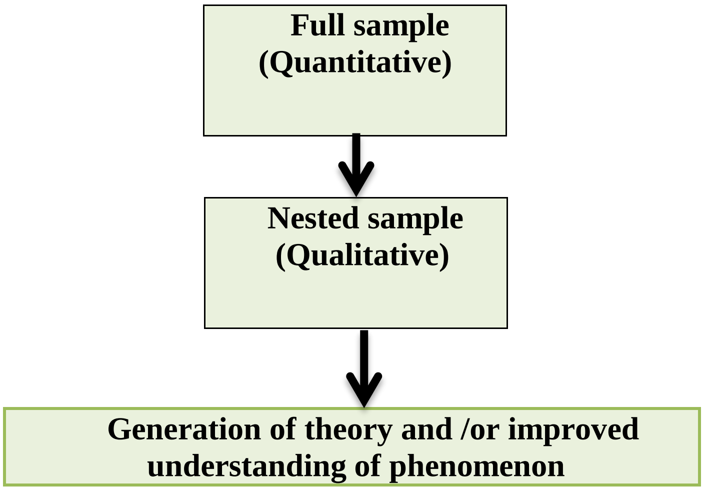
The sample for the current study were drawn from people with type 1 and type 2 diabetes in four (4) universities teaching hospitals, across all the three regions that made up the Federal Republic of Nigeria. These institutions (University Teaching Hospitals) were selected based on the accessibility of patients from different ethnic backgrounds, and additionally on the fact that the universities teaching hospitals system serves as the largest health care institution in Nigeria. More so with this, it becomes easier to employed a purposive sampling for the selection of the participating centres since mostly ethnic groups which comprise the population in the geopolitical regions in Nigeria (Northern, Southern and Eastern) are accessible with these universities teaching hospitals.

The current study employed two data collection methods - the quantitative phase utilised a survey approach and the qualitative phase utilised focus group interviews. Sampling strategies, data collection, questionnaires and analysis techniques will be discussed separately for each phase of study.

3.8.1 Sampling Strategies

The two-dimensional sampling model (Onwuegbuzie & Collins, 2007) was utilised to determine a rigorous sampling design for the study. The two-dimensional sampling model provides categories in which mixed method sampling design can be grouped according to: the time orientation of the components, i.e. sequential or concurrent, and the relationship of the quantitative and qualitative samples i.e. identical: (exactly the same participants in both the quantitative and qualitative phases of the study; or parallel samples for the qualitative and quantitative phases are different but drawn from same underlying population; or nested sample members selected for one component of the study represent a subset of those participants chosen for the other phase of the study; or multilevel: the use of two or more samples that are drawn from different levels of the study). According to Collins et al., (2007) this model provides a framework for "making the decisions explicit and promotes interpretive consistency" (p.290) between interpretations made and the sampling design used, as well as other stages of the development, planning and implementation of the study.

Figure 3.2: **shows the flow of nested sampling designs** (Onwuegbuzie & Leech, 2007, p. 47).



As showed in the figure 3.2 above, the current study employed a sequential time orientation with a nested relationship between quantitative and qualitative data collection processes, i.e. the quantitative data was collected first with a large sample, followed by the qualitative data collected with a nested sample. Similarly, the adaptation of the nested approach was to form group based on the quantitative results and follow up with the group through subsequent qualitative study.That is, this study used quantitative participant characteristic to guide purposeful sampling for a qualitative phase (Creswell, Plano Clark et al., 2003).

3.9 Chapter Summary

This chapter explained indepthly the reasons for the choice for the use of mixed methods in the current study and the design employed. It also established the relevance of mixed methods in health psychological research and identified good quality in the assessment of the current study by offering how the challenges associated with mixed methods have been minimized.

CHAPTER FOUR

PILOT STUDY

4.0 Introduction

This chapter explains the purpose of the pilot study and the procedure taken in the validation of all the quantitative measures adopted for the current study in relation to the population for which the sampling frame was taken.

4.1 Pilot Study

The entire current study was piloted, before beginning the main study. In accordance with the views of Polit and Hungler (1995 p. 38), that the principal focus of a pilot study among other things will be to assess the adequacy or the inadequacy of the data collection plan to test the technical equipment (scales) intended for the use in the study and to establish the understanding and acceptability of questions by respondents. Similarly, Bryman (2001 p.155), maintained that the desirability of piloting the research questionnaire is not solely to do with trying to ensure that survey questions operate will; piloting also has a role in ensuring that the research instruments as a whole function well. In addition Bryman (2001 p. 155), argued that pilot studies are crucial in relation to research based on the self- completion questionnaires, similarly to the current study. The reason advance by Bryman (2001) was that in such study there may not be an interviewer at hand present to clear up any confusion.

Accordingly, in piloting the instruments for the current study the researcher focused attention on the areas of potential problems relevant to the main study. Such areas included:

1) On the issue of clarity of the questionnaire: Was it readable, clear, well-numbered, and each item distinct from each other to attract the interest of respondents and yield high response rates.
2) On the issue of respondents' answers (ticking or circling) the right choice (s). How do they understand the scales and the ratings? Are the respondents answering the questions the same pattern so that the resulting data is not reliable and valid because there is no variability to analyse.

3) The wordings used for each question was piloted to gauge if any were, found to have offensive, provocative, derogatory, abusive, insulting or stigmatizing aspects, that may affect respondents responses to such questions.
4) Time estimated for completing the study and respondents comments was piloted to gauge whether the length of time may actually affect respondents completing the study.
5) On the reliability of the scales the pilot testing result showed higher Cronbach's alpha in each of the measurements on the data collection section. Similarly, all the instruments were subjected into a factor analysis which aim is to determine data reduction. Although, in psychological research factor analysis is an important tools in which underlying components are suspected but difficult to detect. However, given to the factorial analytical results showed that two of the study measurement i.e. (stressful life event scale measuring stressors, and the mastery scales, measuring sense of personal control) had a Cronbach's alpha below the coefficient of 0.40 and is considered "unacceptable" in most social science research situations as such both scales were discarded from being used for the main study. See table 4.1 below for the detail factor analysis data and the coefficients of all the measurements used for the pilot study. In addition the factor analysis data resulted in a reduction of the number of the items e.g see table 4.1 which shows on the reduction in Health Locus of Control Scale.

   Before piloting the study, the entire instrument was also reviewed by the supervisory team who provided constructive critique and important recommendations before it was sent to the faculty research degree committee (FRDC) for evaluation. The instrument was then approved as valid for the study by the FRDC. Further to the approval, the initial questionnaire was piloted among ten willing adults (5 males; 5 females) with a diagnosis of diabetes mellitus and who were attending their clinic routine appointments at the University of Benin Teaching Hospital as they were waiting to be seen. Individuals were approached by the researcher and explanations were given about the study.They were asked if they were willing to provide feedback on study materials, in particular the study questionnaire. The sample for the pilot study shared the same characteristics with those intended for the main study. As recommended by Bryman, (2001, p.155), that it is best, if the researcher can select a small set of respondents, who are comparable to members of the population from which the sample for the full study will be drawn.

The researcher explained to each participant the aim and objective of the main study and the reason for conducting the pilot study. They were dually informed that the aim of the pilot study is to try-out the instruments of the main study for any potential problem so that corrections and modifications can be done before the main study and they were told that any information obtained from them will be treated with absolute confidentiality and destroyed immediately at the end of the pilot test. More so, the questionnaire took participants approximately one and half hours to complete. And upon the completion of the questionnaire there were a one on one discussion of the whole instrument of data collection with respondents and the researcher.

Furthermore, in the pilot study the researcher requested that the respondents be as honest as they could be and also to be highly critical about the whole procedure. They were encouraged to ask questions and comment on issues they felt they did not understand or on items or wordings they felt should to be removed or re-worded to make a generally acceptable question.

Table 4.1 Showing the Cronbach's alpha in each of the measurements after Pilot study.

ITEMS	NO OF ITEMS	NO OF ITEMS REMAINING AFTER PILOT STUDY	CRONBACH'S ALPHA
GAD-7 Anxiety Scale:	7	7	0.78
Insomnia Severity Index (ISI	7	7	0.91
The perceived stress scale (PSS-	10	10	0.55
Beck Depression inventory (M- BDI	20	20	0.88
Fatigue Assessment Scale (FAS	10	10	0.75
World Health Organization Quality of Life (WHOQOL-BREF	26	26	0.91
The Satisfaction with Life Scale SLS	5	5	0.94
Life Stressors Questionnaire	33	0	0.37
Self-Mastery Scale SMS	7	0	0.32
Rosenberg Self-Esteem Scale	10	10	0.68

Life Orientation Test-Revised (LOT-R	10	10	0.65
Medical Outcome Study (MOS) Social Support Scale	18	18	0.95
Negative religious coping(NRCOPE)	7	7	0.88
General self-efficacy scale GSES	10	10	0.97
Health Locus of control (LOC)	18	12	0.52
Sense of coherence (SOC)	13	13	0.63
Duke Religion index (DUREL)	5	5	0.92
Brief COPE Scale	26	26	0.73

4.2 Chapter Summary

In summary, the piloting of the questionnaire is validated for use in the main study. More so, the scales were subjected into factor analysis and the results showed a high Cronbach's alpha in terms of their reliability. However, the final sample recruited for the main study is reported in chapter 7.

CHAPTER FIVE

QUANTITATIVE METHOD

5.0 Introduction

The previous chapter presented the research methodology and study design. As discussed this cross-sectional study was conducted with a sequential mixed explanatory design to explore and explain the difference of ethnicity, gender and type of diabetes in the relationship between psychological, socio-cognitive health indicators. The quantitative data provided valuable broad context information about the population group of people with diabetes for the study and provide rationale for a follow up explanatory model for the priority qualitative component. The qualitative data contributed perspective and experiences in more detail, providing depth, complementary and an expanded understanding of the construct under study. This chapter detailed the Quantitative sampling strategy, Questionnaire, considerations of ethical issues and expectations of protecting participant’s rights are outlined.

5.1 Quantitative Study Sampling Strategy

A survey approach was taken with the quantitative phase of the study utilising a disproportionate stratified sampling scheme. According to Corbetta (2003) disproportionate sampling happens when a researcher decides to over represent some strata and to under- represent others. Here, the sample drawn in each stratum (i.e., ethnic and gender) were based on an unequal number from the reference population in each participating site. However, after a random selection was made inthe stratum (ethnicity and gender) it became expedient to choose unequal numbers of gender and ethnicity to have the desired sample needed in this study, because genders and ethnic group have naturally disproportionate representation in the target population. In other words, the use of disproportionate stratified sampling allows for the possible total sample used in this study. Similarly, this sampling strategy was chosen because an overall impression of the study’s population group was desired to provide a frame of reference when interpreting quantitative data. The nature of sampling from the full population enabled the quantitative drawing of statistical significances (Collins et al., 2007), and generalizability of results to the broader population of interest.

It is important to note however, that a major limitation of this form of data collection and analysis requires accurate information on proportion in each stratum; if stratified lists are not already available, they can be costly to prepare. However, the researcher adopted these steps toprepare the information as regards to sampling of the participants in each stratum, by drawing a list for participation via patient medical files (registry) who meet the inclusion criteria and then randomly sampled all the names in each stratum (by ethnicity, gender and type of diabetes) as to account for a proportionate sample. However, only those who finally consented to take part in this study became potential participates which then formed a disproportionate sample in each stratum. This was why this study adopted a disproportionate stratified sampling. And moreover genders, ethnic group and type of diabetes were naturally disproportionately represented across the diabetes population.

The size of the sample is determined or informed primarily by the research objective, research question(s), and, subsequently, the research design (Onwuegbuzie & Collins, 2007). In addition, Bridqet & Cathy, (2012) asserts that the sample dependent on the accuracy required and the likely variation of the population characteristics being investigated as well as the kind of analysis to be conducted on the data. Similarly, this study intends to use a multivariate analysis.However, in determining sample size, Tabachnick & Fidell (2007) recommend that, in order to conduct a multiple analysis, the number of participants should be the greater of either: the number of predictors times 8, plus 50, *or* the number of predictors plus 104. Given that the study utilises 20 predictor variables this would suggest a minimum of 210 participants but 486 participants were sampled as to provide a sufficient sample size for the quantitative phase of the current study.

Consequently, the quantitative survey considered that the sample should be sufficiently large so that the major sub-group contain at least 100 cases while the minor sub-group contain between 20 and 50(Fowler, 2008; Oppenheim 2000). In Nigeria the three major ethnic groups (e.g. Hausa, Igbo and Yoruba) constitute (62%, of the population, while the minor sub-group (e.g. Edo, Ijaw, Ibibio, Ebira, Nupe, Gwari, Itsekiri, Urhobo, Igala, Idoma and Tiv) comprises 33%; with the other minorities (e.g. Ikwerre, Ogba Ogoni) 5%. More so larger samples more accurately represent the characteristics of the populations from which they are derived (Cronbach, Gleser, Nanda, & Rajaratnam, 1972; Marcoulides, 1993). As such it is good practice to overestimate rather than underestimate sample size to allow for attrition or non-response (participants withdrawing from research or failing to return questionnaire.

5.2 Data Collection – Quantitative Study

Survey

The Quantitative phase I study employed survey methods. According to Knapp (1998 p.67) a survey research is any research that is based on a probability sample, which is drawn from a defined population in such a way that every subject has a known probability of being selected. According to Polit and Hungler (1995: p 200), a survey is designed to obtain information from populations regarding the prevalence, distribution and interrelations of variables with those populations. They explained further that surveys are used to obtain information from a sample of people by means of self- report, in which the study participants respond to a series of questions posed by the investigator. Accordingly, the survey strategy also yields data that are primarily quantitative and statistically analysable (Polit and Hunger 1995: p.200). These are some of the features needed in the current study. In other words, survey method is used when a researcher wants to collect standardized information from a specific population (e.g. diabetic patients) especially, although not exclusively by the use of questionnaire (Robinson 1993 p.49). Although survey samples tend to be very large, however only a relatively small amount of information is collected from any one individual, contrasting with a case study, where a great deal of information might be obtained from a ‘key information; In addition there is no attempt to manipulate variables, or control conditions as would be the case in experimental strategies (Robinson 1993 p.49). Moreso, Robinson (1993 p.49) maintained that the survey tactics is suitable for descriptive or correlational studies where the researcher is interested on how many people in a given population possess a particular attribute. Although Robinson (1993) argued that the interest of such a study is not normally on individuals person, but on profiles and generalized statistics drawn from the total sample and generalized to the population. Participants were recruited utilising the stratified sampling method, whereby all people meeting study criteria, and are happy to take part in the study from all the participating sites where administered the study questionnaire.

5.2.1 Participants Recruitment Procedures (Quantitative Phase 1)

After obtaining permission from each participating teaching hospital through the ethical review committee and upon the approval to commence the study in all the respective sites the hospital’s medical records were contacted for sampled selection through patients' cards (register), whereby all people meeting study criteria were identified by the following:

1.) On time Frame: Patients with an established diagnosis of Type I or Type II diabetes mellitus within 0-12 months of inception of the study were sampled. The reason is that twelve months is the cut-offso that patients with prolonged chronic illness will not be included since many may have induced stress. Those within the twelve months of diagnosis and treatment for diabetes mellitus may show more curiosity or motivation to participate hoping to find some explanation to their illness.

2.) Children and young adults or those under the age of 18 were not sampled. Although the majority of people accessing health care services with type I and type II diabetes are adults. Therefore, this study purposely focused on adults with diabetes, excluding children and young peoplesince they may not appreciate or have experienced the economic hardships and other socio-demographic variables reported to have comorbidity to diabetes (e.g. marital status and employments).

3.) Other attributes: Patients who are currently pregnant were not sampled (to avoid the confounding psychological and medical effect). Similarly patients with health complications and those with obvious damage to the brain system or any other concomitant diseases were excluded.

Patients who met these inclusion criteria were identified after the examination of their medical files in agreement with the hospital authority and in anticipation of the good understanding with patients GPs. This was done ahead in preparation for the patients' regular check-up as a list of those who met these inclusion criteria were generated and coped to their GPs. Potential selected participants were asked by their GPs if they will like to participate in the study during their consultation. However, patients who agrees to participate were directed to a hall/room allocated for the conduct of the study and upon patients arrival to the venue, were briefly informed about the purpose of the study, issues concerning confidentiality were made clear to them and they were told that they had the right to refuse participation and could withdraw at any time after which a written consent were obtained before the patients were administered the questionnaires.

5.2.2 Data collection – Study Questionnaire

The current study employed structured (closed ended) questionnaires in the quantitative phase of the study, while focus group interviews were used for the second phase of the study to gain subjective view of participants which aims to expand on the findings from the quantitative results. In other words a survey approach was taken for the quantitative part of the study with data collected by completion of a self-administered questionnaire. Moreover employing this questionnaire enables large variables to be investigated. Similarly, questionnaires offer researchers the opportunity to gather large amounts of data, due to the number of questions that can be asked. In addition, Kumar (2010, p .148) identified some advantages of using questionnaires as a research method, they are economical to produce, both in cost and time, allowing a large number to be administered/ sent out thus increasing the possibility of getting a range of responses back. Participants also have anonymity, as their name does not appear on the questionnaire. From this it is clear that if participants know they are going to remain anonymous, they are more likely to answer truthfully, which is essential in order for the research to be accurate. It also helps to provide data that can be compared with similar studies in other countries.

5.2.3 Review/Adaptation of Measures

Relevant literatures were reviewed to determine the most appropriate measures to be utilised in the current study. (e.g. Life Orientation Test-Revised (LOT-R), Scheier et al., 1994 and Percieve stress scale Cohen et al., 1993). However, the selection of items that formed the self-reported questionnaire was determined based on the following criteria: 1) the most appropriate questionnaire that has been the most widely used tool in the literature, 2) evidence of reliability and validity from studies in a variety of countries, 3) specifically and directly relevant to issues pertaining to research questions, aims, objectives, their relatively brief measures, their cultural validity, for their use in research with chronic illness (diabetes) and for previous use by psychological research.The resulting questionnaires comprised an amalgamation of many scales. And these scales are formed in the following three groups or orders in the overallquestionnaire: (1. psychological health (Question 1-7), Socio-cognitive (Question 8-16) and Socio-demographics (Question 17-28). Adopting this order enabled the grouping of the variables that are the independent and dependent variables for this study. The constituted questions/scales are as follows.

Q1.Beck Depression Inventory (M- BDI – 20): Depressive symptoms were measured by using a modification of the Beck Depression Inventory (M- BDI – 20) items instead of the original (BDI – 21) items. The Beck Depression Inventory (BDI) is one of the most widely used instruments to assess depression. According to Mikolajczyk et al., (2008) the modification of the original (BDI – 21) to (M – BDI – 20) included two approaches:

(a) that the four items per symptom, which assessed the specific symptoms intensity in the original (BDI – 21) were replaced by a single statement per symptom with a six – point likert scale measuring its frequency in the last 4 weeks with the two extreme categories labelled as (0 = “Never”, to 5 = “Almost always”); and

(b) One symptom which exhibited low specificity (“Loss of weight”) was excluded to leave 20 – items, instead of the original 21 – items. Respondents were to rate each of the 20 – depressive symptoms according to their perception using a Visual Analogue Scale (VAS) format. The respondents were asked to indicate how frequently they experienced each of the 20 symptoms (e.g.; I feel sad’) the options ranges from (0 = ‘Never’ to 5 = ‘Almost always’). The M – BDI – 20 modifications was validated by Schmitt, Beckmann, Dusi, Maes, Schiller, Schonauser 2003; Schmitt and Maes 2003). The M-BDI and BDI has been standardized and widely used in Nigeria (Eze, 2008; Micheal, 2013 unpublished PhD thesis).The M – BDI – 20 was reported to have high internal consistency reliability (Cronbach’s alpha of 0.90, 0.92 and 0.87) (Mikolajczk et al 2008; Stock et al 2007). However, in the present study a Cronbach’s alpha of 0.88 was obtained, thus indicating very high reliability.

Individual score is computed by summing their responses for all items of the scale. More so the authors of the M – BDI in their various publications (Schmitt et al 2000, 2003, 2006) provided a cut – off point at a score of M – BDI ≥ 35 for clinical relevant depression which corresponded to the 85th percentile in a representative sample in addition Schmitt et al (2006) reported that the construct validity and measurement equivalence of the M – BDI was excellent and comparable to those of the original BDI validated by (Beck, Steer and Garbin 1988).

Q2: GAD-7 Anxiety Scale: Anxiety was measured by the 7-items anxiety scale (GAD-7), which was initially developed to diagnose generalized anxiety disorder) and validated in 2740 primary care patients (Spitzer et al., 2006). Though originally developed to diagnose generalized anxiety disorder, the GAD-7 also proved to have good sensitivity and specificity as a screener for panic, social anxiety, and post-traumatic stress disorder (Kroenke et al., 2007).

The GAD-7 Anxiety Severity is calculated by assigning scores of 0, 1, 2, and 3, to the response categories of ―not at all, ―several days, ―more than half the days, and ―nearly every day, respectively. GAD-7 total score for the seven items ranges from 0 to 21. Scores of 5, 10, and 15 represent cut-points for mild, moderate, and severe anxiety, respectively. Though designed primarily as a screening and severity measure for generalized anxiety disorder, the GAD-7 also has moderately good operating characteristics for three other common anxiety disorders – panic disorder, social anxiety disorder, and post-traumatic stress disorder. When screening for anxiety disorders, a recommended cut-point for further evaluation is a score of 10 or greater.

In addition the GAD-7, cut-point of 10 or greater is considered a ―yellow flag (i.e., drawing attention to a possible clinically significant condition), while a cut-point of 15 is a ―red flag (i.e., targeting individuals in whom active treatment is probably warranted).In the present study a Cronbach alpha of 0.78 was obtained, showing a high realiability of the scale.

Q3.The perceived stress scale (PSS- 10): This is regarded as the most widely used psychological instrument for measuring the perception of stress because of its established validity and reliability (Cohen, Kamarck, Mermelstein 1983; Cohen Tyrrell, Smith, 1993, Gibson and Myers 2006). The PSS – 10 contains 10 questions with answers ranked using a 5 – Likert scale that assesses experiences and response to stress during the last month (e.g.; "In the last month, how often have you been upset because of something that happened to you unexpectedly?" with response: 0 = Never; 1 = Almost never; 2 = Sometimes; 3 = Fairly often and 4 = Very often.

Total score of PSS – 10 is calculated by first reversing the score responses of questions 4, 5, 7, & 8 and then sum all the scores across all the items for questions 1, 2, 3, 6, 9, & 10.The total score ranges from 0 – 40. The following cut off scores was recommended by Cohen et al (1983): 0 -7= Vey low; 0-11-low; 12-15=Average; 16-20=High; 21 and above=Very high). In the descriptive analysis the mean total score will be dichotomized into Low score = 0 -15 High score = 16 – above as to enable for identification of participant who had less stress and those with high level of stress. According to Cohen et al (1983) higher perceived stress scale scores are associated with higher levels of stress and indicate a greater likelihood for stress interfering with things like lifestyle changes relevant to diabetes patient (e.g., a person's effort in watching or monitoring what to eat or not), and their ability to improve in bring sugar level in balance. Similarly Cohen et al (1983) also noted that higher stress score are associated with an increase in a person's vulnerability to compromised health, and increased susceptibility to stress induced illness. O' Connor and O' Connor (2003) showed that the PSS yield good test-retest reliability of 0.70. In a study among diabetes patients, (Schwartz et al., 2011) reported that the Cronbach's alpha of the PSS in their study = 0.88. However, in the present study a Cronbach's Alpha of 0.55 was obtained, so indicating high reliability.

The PSS has several advantages. Firstly, it is an economical scale that can be administered in only a few minutes and it is easy to score. Secondly, the PSS items are easy to understand and the response alternatives are simple to grasp. Thirdly, PSS is not limited for a particular situation; thus, it is applicable for occurred and ongoing life events. Finally, the PSS can be used as an outcome variable, measuring people's experienced levels of stress, coping processes, and personality factors (Cohen et al., 1983; Cohen & Williamson, 1988).

In addition, (Cohen Doyle, Turner, Alper and Skoner 2003) reported that PSS – 10 and 14 – item predictive and discriminant validities was good in studies that related the measured concept of stress to health outcomes. The PSS was adapted from Cohen, Kamarck and Mermelstein (1983).

Q4. Insomnia Severity Index (ISI): In the current study Insomnia was measured by a 7-item self-report questionnaire assessing the nature, severity, and impact of insomnia: the Insomnia Severity Index (ISI), Bastien et al., 2001; Morin 1993). The usual recall period is the "last month" and the dimensions evaluated are: severity of sleep onset, sleep maintenance, and early morning awakening problems, sleep dissatisfaction, interference of sleep difficulties with daytime functioning, noticeability of sleep problems by others, and distress caused by the sleep difficulties. A 5-point Likert scale is used to rate each item (e.g., 0 = no problem; 4 = very severe problem), yielding a total score ranging from 0 to 28. The total score is interpreted as follows: absence of insomnia (0–7); sub-threshold insomnia (8–14);

moderate insomnia (15–21); and severe insomnia (22–28). Three versions are available—patient, clinician, and significant others—but the present studies focuses on the patient version only. Previous studies have reported adequate psychometric properties for both the English and French versions (Blais et al., 1997). In the present study a Cronbach's alpha of 0.91 was obtained, showing a good reliability of the scale.

Q5.Fatigue Assessment Scale (FAS): Fatigue in the current study was measured by the FAS (Michielsen *etal*. 2003. It is designed to rate statements distinguishing fatigue from depression. With 10- items: five questions reflecting physical fatigue and five questions assessing mental fatigue. Although these two aspects of fatigue are represented in the questionnaire, the FAS was unidimensional when completed by a Dutch working population and a representative group of the general population (Michielsen *etal*., 2003; 2004) as well as in sarcoidosis patients (De Vries etal., 2004; Michielsen *etal*., 2003). The unidimensional structure indicates that the FAS total score should be used. The response scale is a 5-point scale (1, never to 5, always). Scores on the FAS range from 10 to 50, with 50 representing the most fatigue. The FSS were employed among people with type 2 diabetes (Singh and Kluding 2013). The psychometric properties are good in Dutch healthy individuals and sarcoidosis patients (De Vries et al., 2004) in the BC patients; Cronbach's alpha internal consistency was 0.88, in the BBP group 0.92 and in the current study a Cronbach's alpha of 0.75 was obtained, showing a high reliability of the scale.

Q6: Satisfaction with life scale (SWLS): life satisfaction was measured with the Satisfaction with life scale (SWLS) adapted from (Diener et al 1985). This is a five item scale assessing positive cognitive appraisals of life in general, with items (e.g., "In most ways my life is close to the ideal") rated from 1 (Strongly Disagree) to 7 (Strongly Agree). Numerous studies (e.g., Diener et al 1985, Pavot and Diener 1993) have reported a positive reliability and validity of the SWLS. In addition the SWLS test – retest reliability of 0.82 and internal consistency of 0.87 was reported by (Dorahy et al 1998) in their study. While from this current study a Cronbach's alpha of 0.95 was obtained. The cut-off point recommended by the authors are dichotomized in the current study as

21> Satisfied with life

21 < Dissatisfied with life

The authors recommended that the scoring can be kept continuous (Sum up scores on each item), however other studies employed cut off points similar to the one used in the current study (e.g., Pretorius et al., 2010) in their study among diabetic patients.

Q7: World Health Organization Quality of Life (WHOQOL-BREF): Quality of life was measured with the abbreviated 26-item version of the WHOQOL-100 containing items that were extracted from the WHOQOL-100 field trial data. The WHOQOL-BREF contains one item from each of the 24 facets of QOL included in the WHOQOL-100, plus two ‘benchmark’ items from the general facet on overall QOL and general health (not included in the scoring).

The facets were originally subsumed within one of six domains but factor analysis of the WHOQOL- 100 indicated that Domain 1 could be merged with Domain 3 (physical with independence), and Domain 2 with Domain 6 (psychological with spirituality, religion and personal beliefs) thereby creating four domains of QOL (Skevington, 1999). Similar results were found during the extraction of data for the WHOQOL-BREF (WHOQOL Group, 1998b), which is currently scored in four domains: Domain 1: Physical health, Domain 2: Psychological, Domain 3: Social relations and Domain 4: Environment, with all facet items scored as part of their hypothesised domain. Domains are not scored where 20% of items or more are missing, and are unacceptable where two or more items are missed (or 1-item in the 3-item social domain). The scores are transformed on a scale from 0 to 100 to enable comparisons to be made between domains composed of unequal numbers of items.

During development of the WHOQOL-100, four types of 5-point Likert interval scale were designed and tested to reflect intensity, capacity, frequency and evaluation, and one of these was attached to each item (Szabo et al., 1997). These response scales were also used in the WHOQOL-BREF. Items inquire ‘how much’, ‘how completely’, how often’, ‘how good’ or ‘how satisfied’ the respondent felt in the last 2 weeks; different response scales are distributed across the domains (Sartorius & Kuyken 1994).

The 26 items of the WHOQOLBREF is short enough to be used where time is at a premium, where respondent burden is high or where facet detail is unnecessary. It has wide ranging uses in clinical settings and clinical trials. The WHOQOL-BREF has several strengths. It is based on a cross-culturally sensitive concept and is available in most of the world’s major languages; hence it is appropriate for use in multinational collaborative research. In addition, the WHOQOL-BREF can generate a profile of four domain scores within a relatively small item set of 26 items.

However its conceptual and methodological strengths, combined with the good psychometric properties described by Skevington, 2003, suggest that WHOQOL-BREF may have a place among the leading generic QOL instruments. The WHOQOL was also employed by (Odili, et al 2008) in their study of diabetic patients in Nigeria. In assessing patients overall quality of life, in the current study scores based on the raw score for each domain of WHOQOL-BREF were calculated by adding values of single items. Raw score were transformed on the scale ranging from 0 to 100, where 100 is the highest and 0 the lowest health related quality of life. The negatively-worded items had reversed score. Similar cut-off point was employed by Odili et al., (2008). The subject selects the number that best represents their opinion, based on their life over the previous 2 weeks. The 5-point Likert scale ranges from 1 through 5. Higher score indicate a better quality of life. A high Cronbach’s alpha of 0.96 was obtained in the present study.

Q8. Sense of coherence (SOC): the most common way of measuring sense of coherence is to use the SOC scale developed by Antonovsky. The SOC in the current study was measured with a Norwegian 13 – item short version of the originally 29-item orientation to life Questionnaire based on Antonovsky’s conceptualization of SOC was used (Antonovsky, 1987). Similar version and wordings was employed in the study of diabetes population (e g. Ahola et al, 2010; Eriksson, 2013). Based on a VAS question format, the respondents are requested to mark their response to each item on a 7-point scale with two anchoring verbal response, for example “very seldom/ never” and very often” one example is “Do you have the feeling that you don’t really care about what goes on around you? “And “has it happened that people whom you counted on disappointed you?” The total sum ranges from Q1- 13. Higher score indicates stronger SOC, without any particular cut off score recommended by the author (Antonovsky 1987; Eriksson& Lindstrom, 2005). In addition the (SOC -13) scale also measures personal integrity and cohesion using three factors: Comprehensibility -5 items on the scale represented by (Questions 2,6,8,9,11) manageability -4 items, (question 3,5,10,13) and meaningfulness -4 items (questions 1,4,7,12). The sum score for comprehensibility ranges from (7-35), the sum score for manageability ranges from (7-28) and the sum score for meaningfulness ranges from (4-28). Higher score indicates the stronger the sense of coherence. Research evidence shows that the 13 – item SOC scale's psychometric properties are comparable to the original version (SOC-29) with crombach's alpha ranging from 0.70 to 0.92 (Eriksson & Lindstom,2005; Hittnez 2007) and a test-retest correlations that ranges from 0.69 – 0.72 (Eriksson- & Lindstom 2005). In the present study a crombach's alpha of 0.63 was obtained, thus showing a high reliability.

Q9. Locus of Control (LOC): In this study, LOC was measured with the multidimensional Health locus of control Form C, designed for use in those with an existing health/medical condition. The MHLC Wallston, Wallston & Devellis (1978), is composed of 18 items with three subscales: (a) Internal health locus of control (IHLC) contains 1,6,8,12,13 and 17 (sample item, `if my diabetes worsens, it is my own Behavior which determines how soon I will feel better again`) (b) Powerful health locus of control (PHLC) contains 2,4,9,11,15 and 16 (sample tem, `whenever my diabetes worsens, I should consult a medical professional`), (c) Chance health locus of control (CHLC) contains items 3,5,7,10,14 and 18 (sample these items where rated using six point Likert scale ranging from `1` strongly disagree to `6` strongly agree. Score for each subscale can range from 0.65 and 0.75 and, test retest reliability is between 0.70 and 0.80.

In the current study analysis was based on the mean score of each subscale. Similar items and analysis were used by Wardle et al 2004 and Adeniyi 2009). The MHLC scales have been used extensively in health research, and have adequate internal consistency (e.g. Carmen et al., 2009). In addition, the Cronbach's alpha specified for the internal scale, powerful others scale and Chance scale were .81, .75 and .55, respectively, was reported in a study among IDDM-sample (Fournier et al., 2002). However in the present study a Cronbach's alpha of 0.52 was obtained for the total of the MHLC, showing an acceptable reliability.

Q10: Rosenberg Self-Esteem Scale: Self-Esteem Scale was measured by the Rosenberg a widely used self-report instrument for evaluating individual self-esteem; it is a 10-item scale that measures global self-worth by measuring both positive and negative feelings about the self. The scale is believed to be uni-dimensional. All items are answered using a 4-point Likert scale format ranging from strongly agree to strongly disagree. Items 2, 5, 6, 8, 9 are reverse scored. Give "Strongly disagree" 1 point, "Disagree" 2 points, "Agree" 3 points, and "Strongly agree" 4 points. Sum scores for all ten items. Keep scores on a continuous scale also the possible score ranges from 10 to 40 and a high scores indicate higher self-esteem. Alpha coefficients ranges from 0.72 to 87 and test-retest correlation of 0.82 to 0.88 have been reported (Rosenberg, 1965). Studies from the U.S. diabetes sample, self-esteem was assessed by the Rosenberg Self-Esteem questionnaire Rosenberg, 1979) with good reliability (Cronbach's α = 0.77–0.88), (Blascovich, & Tomaka 1993). However, the current study obtained a high Cronbach's alpha of 0.68.

Q11: Brief COPE Scale): copingwas measured by the Brief COPE (Carver 1997), is a 28-items measures of differentways of coping with stress: problem-focused andemotion-focused coping strategies. This inventory was derived from the original COPE which was based on theLazarus and Folkman coping model (1984) and from the Carver and Scheier model of Behavioral self-regulation(Carver 1997). The Brief COPE which consists of 14 distinct coping strategies shows good reliabilitycoefficients: active coping (α=0.68), planning (α=0.73), seeking emotional social support (α=0.71), seekinginstrumental social support (α=0.64), focus on and venting of emotions (α=0.50), Behavioral disengagement(α=0.65), self-distraction (α=0.71), positive reframing (α=0.64), humor (α=0.73), denial (α=0.54),acceptance (α=0.57), religion (α=0.82), substance use (α=0.90) and self-blame (α=0.69). Each item is evaluated according to a four-item scale (don't do this at all- do this a little bit-do this a medium amount- do this a lot) ranging from 1 to 4 points. The minimum score for each strategy is 2 points and the maximum score is 8 points. Low scores prove that an individual does not usually use a specific strategy in order to handle stress, whereas the high score do. In the analysis of the current study the 14 distinct coping strategies were classified into problem focus coping and emotional focus coping. However, a high Cronbach's alpha of 0.73 was obtained from the total subscale of the Brief COPE in the present study, indicating good reliability.

Q12: **General Self-efficacy Scale (GSES):** This 10 item psychometric scale used in the current study was designed to assess optimistic self-beliefs to cope with a variety of difficult demands in life. The scale was originally developed and validated by Matthias Jerusalem and Ralf schwarzer (1992). It is a 10-item scale which participants responded by indicating their extent of agreement with each of the 10-statements based on a four-point Likert scale of 1 (not at all true) to 4 (exactly true). Examples of items in the scale include “It is easy for me to stick to my aims and accomplish my goals” and “if I am in trouble, I can usually think of a solution”. According to Jerusalem and Schwarzer (1992; 1995) “Higher scores on the self – efficacy scale indicate high self – efficacy. The scale showed a high internal consistency with cronbachs alpha (a) ranging from .75 and .90 (Schwarzer and Jerusalem). However, in the present study a Cronbach’s alpha of 0.96 was obtained showing a high reliability.

In addition the convergent and discriminant validity of the scale has been proved (e.g. the GSES showed a positive correlations with self – esteem and optimism and correlates negatively with anxiety, depression and physical symptoms (Schwarzer and Jerusalem 1995) the total score is summed by adding score for each response, and it ranges from 4 lowest score to 40 highest score. Similar items and wordings of (GSEs- 10) used in the current study were used by other researchers in their study of diabetes patients (e.g. Cramm et al, 2012; Macchiagodena et al, 2008).

Q13: Life Orientation Test-Revised (LOT-R): Optimism was measured by the Life Orientation Test-Revised (LOT-R), Scheier et al., (1994), it measures dispositional optimism. This 6-item self-report measure (with four additional filler items) assesses to what extent an individual generally expects positive versus negative outcomes, with statements such as “In uncertain times, I usually expect the best” and “I rarely count on good things happening to me”. Items are scored on a scale from 0 (“strongly disagree”) to 4 (“strongly agree”), and negatively worded items are reverse scored. Higher scores indicate higher optimism. The LOT-R has been found to possess adequate predictive and discriminant validity with a Cronbach’s alpha of 0.78. According to the author the test-retest correlations have ranged from 0.56 to 0.79 when administered at intervals ranging from 4 to 28 months. However, in the current study a Cronbach’s alpha of 0.65 was obtained showing a good reliability of the scale.

Q14. **Duke Religion Index (DUREL):**Organized religiosity and the importance of religion in one's life was measured with a 5 – item in 3 – subscale adapted from the Duke Religion index (DUREL), validated by (Koenig, George and peterson, 1997). The subscales are:

(1) Frequency of religious attendance subscale, measured with 1 – item in question 1 ('how often do you attend church or other religious or spiritual meets'?). The rating ranges between 6 = more than once a week to 1 = Never. Total score ranges from 1 – 6 (2) Frequency of private religious activity subscale. Measured with 1 – item, question 2 (How often do you spend time in private religious or spiritual activities such as prayer meditation or the study of religious texts e.g., Bible, Koran, Torah etc.)? The rating scale ranges from 6 = more than once a day to 1 = rarely or never. Total score ranges 1 – 6 (3) Intrinsic religiosity subscale: This is measured with 3 – item in questions with 3 – item in questions 3 – 5 (e.g., in my life, I experience the presence of the Divine i.e. God). The rating score ranges between 5 = definitely true to 1 = definitely not true. The total score ranges from 2 – 10. A higher score will indicate a higher frequency of religious attendance; higher frequency of private religious activity and a higher frequency of intrinsic religiosity. However the author (Koenig, 1997) advocated that each subscale should be summed up separately for descriptive analysis and in the regression model when examining health outcomes. The authors also recommended that the total score should not be used as a single score because it may cancel out the effects of each other. However the internal consistency of the subscales was reported as very good, estimated and a = .85 among healthy adults. Consequently in the current study the total score of each of the 3 subscales were calculated separately and used in the data analysis and a high Cronbach's alpha of 0.92 was obtained.

Q15.**Negative Religious Coping(NRCOPE):** This is a 7 – item measure that assesses negative religious coping, which is explained as having an ominous view of the world, an insecure relationship with God, and a struggle to find religious significance (pargament, Koening and Perez 2000). Each item is rated 0 to 3 with 0 = not at all and 3 = A great deal (e.g., 'I have wondered whether God has abandoned me'). The total score are summed up with higher scores indicating a higher use of negative religious coping. Internal consistency ranged from 0.78 to 0.92 for the negative scales in the original study with the comprehensive RCOPE (Pargament et al., 2000). However, from the present study a high Cronbach' alpha of 0.88 was obtained.

Q16. Medical Outcome Study (MOS) Social Support Scale: Social support was measured by this scale developed by Sherbourne and Stewart (1991). The questionnaire tool is 19 items long. It is a 'multi-dimensional' scale to measure five 'dimensions' of social support. Emotional Support, Informational Support, Tangible Support, Positive Social Interaction, Affectionate Support. Developed for patients in the Medical Outcomes Study (MOS) – a two-year U.S. survey developed for patients with chronic conditions. And it consists of four separate social support subscales.

State how often each of a number of types of support are available to them should they need it. Respond by indicating on a scale from: 'None of the time', 'A little of the time', 'Most of the time', 'All of the time'.

It assesses changes in the level of social support available to parents/carers who have been identified as being socially isolated, and have been supported to reduce their social isolation. The outcomes of the services or areas of work focused on reducing parents'/carers' social isolation or increasing their levels of social support.

Each subscale is circulated by the average score for the respondent for each item in the subscale.The overall 'support' score is circulated by the average of the score for all the 19 items on the questionnaire.Lowest possible average score (per subscale or overall) is 1 and highest possible average score is 5. A higher average score indicates a higher degree of social support. However, in the current study a Cronbach's alpha of 0.95 was obtained, showing a high reliability.

Q17. **Religious Affiliation:** This was gauged with a single question with a multiple choice option (e.g., what is your religion) with options including Catholic, Islam, protestant, orthodox, others and none. This item was adapted from the wordings used by (Okolie et al 2010) in their study of diabetes patients.

Q18. On Participant Age:(1 item) "How old are you?' For analysis, participant's age was put into three categories. 1 = (18-34), 2 = (35-51), 3 = (52 and above). This catergories was adapted from Ekpenyong et al., (2012) in psychosomatic study in Nigeria.

Q19. **Participants Gender:** Two options 1 = male 2 = female

Q20. **Ethnic Origin**: Four options were offered, based on the major ethnic groups in Nigeria 1 = Hausa/Fulani, 2 = Others, 3 = Igbo/Ibo and 4 = Yoruba. Each response option was computed for analysis.

Q21 Monthly Income: The options were: (1) Less < ₦5,000 or 20 USDollers (2) ₦5,000- ₦25,000 or 20 USDollers – 100 USDollers (3) ₦25,000- ₦45,000 or 100USDoller-180 USDollers (4) ₦45,000-₦65,000 or 180USDollers – 260USDoller (5) ₦65,000 - ₦85,000 or 260USDoller- 340USDoller (6) ₦85,000- ₦105,000 or 340 USDoller – 420 USDoller (7) ₦105,000-above or 420 USDoller, adapted from Ewhrudjakpor (2009.) For data analysis, respondents' income disposal was condensed into three categories:
High income > ₦150,000 or > 536 USDoller
Medium income ₦45,000-150,000 or 180 USDoller- 536USDoller
Low income < ₦45,000 or < 180 USDoller

Q22. Respondents' Levels of Education: The options were: 1=No formal education 2=Primary education 3= secondary education 4= University education.

Q23.**Number of Children:** Respondents were asked, "How many children do you have"? It was an open question with the responses coded into three categories for analysis (1). 0 = None, (2). 1-4=Low, and (3).5-9 = High. The means score was calculated for analyses. Similar wordings were used by (Adebayo et al., 2009).

Q24.Maital Status: participant's marital status, five options where used: 1=Single 2=Married 3= Separated 4= Divorced and 5= Widowed.

Q25. Duration of Diabetes: Respondents were asked "How long have you had diabetes"? It was an open question with the responses coded into two categories for analysis 1=1-6months, 2=7-12months.

Q26.Types of Diabetes: Participants were asked "what type of diabetes do you have"? Two options 1= type1 2=type2.

Q27. Asked respondents where do you live? Two options 1= Village 2= Town.

Q28. Occupation: Participants were asked about their occupation. Five options were provided: 1=Unemployed 2= Civil servants 3= self-employed 4=student 5= others.

5.3 Ethical Approval, Confidentiality

The draft of the research proposal for the current study which contained detailed information's on the research questions, research objectives, purpose of the study, research method, was submitted to the Faculty Research Degrees Committee (FRDC) of the university for approval.

The research proposal (RDI) was thoroughly scrutinized by members of the FRDC who recommended some corrections and minor changes and explanations on some certain issues which were subjected to the chair's action (Faculty Director Approval). However, once the researcher made the required corrections and the explanations better, the FRDC gave their approved for the study, pending ethical approval by the hospitals involved.

Secondly, the researcher sought permission to conduct the research in all the participating University teaching hospital in Nigeria. A letter for permission and approval was sent to the office of the ethical and review committee secretary of each of the 4 hospitals, participating in the study. The letter that was sent to participating hospitals contained the required and most frequently asked questions what the research is all about, its aims and objectives, research title and the research questions. In addition, the researcher made it known in the letter that while there is no harm anticipated in participating in the study, there is equally no benefit that the participants are entitled to either. It was explained in the letter that the research was purely for partial fulfilment for the award of (PhD in Health Psychology).

The letter also explained how participant's confidentiality was maintained by employing a self-anonymous questionnaire, which does not ask participants name, address or any other form of identification. The questionnaire was coded and numbered so that even the researcher could not identify any participant by any means. The letter also explained that apart from seeking the consent of the participant, s/he has a right to withdraw from the study at any time without any legal implication. However, three (3) of the participating hospitals requested a redraft of the proposal protocol after which the researcher made the required adjustment before the ethical committee granted the approval for the commencement of the study. See Appendix H, for the ethical approval letters from the participated teaching hospitals.

5.3.1 Participants Consent

Prior to data collection, the researcher explained the research process to the participants in each participating hospital before administering the questionnaire to the patients. The patients were informed that by all means their personal identity will be guarded and their confidentiality will be guaranteed. They were told that the questionnaire is anonymous which means it will not contain their names or personal addresses that may reveal their true identity. The patients were informed that apart from ticking the anonymous questionnaire, that the second phase of the study requires a voluntary indication of their telephone and name in a separate sheet for the follow up, if they are happy and available to participate. More so the potential participants were assured that their participation or non- participation in the study Phase I and II would have no legal proceedings against their decision whatsoever. They are also informed that they have the right to withdraw their participation at any time without any legal implications. All potential participants were provided with a written information sheet about the nature and content of the study and were able to self-determine their level of participation. Participants signed the consent form before ticking and returning the questionnaires and most of the participants were offered assistance from either the researcher or a hospital stuff which serve as a research assistance to complete the questionnaire if they wished. Those who participated in an interview (focus group) provided further written consent at the time of interview.

Furthermore the researcher informed each potential participant that though they can withdraw at any time, but when once the questionnaire is returned into the collection box, it would be impossible to retrieve it because of its anonymity which lacks individual identification. In addition the potential participants were also informed that after the study, the data will be secured in a locked box accessible only to the researcher on to the University of Gloucestershire in England and that after a period of (5) years all data related to the study will be destroyed by burning. The participants were told that the result of the current study will be used to enhance knowledge and contribute to the improvement of health of diabetic patients and promote long life and happiness. They were also informed that the study may be published in a journal though their identity will never be revealed.

The current study was conducted under both theBritish Psychological Society Code of Conduct (University of Gloucestershire) and the Nigerian National Code for Health Research to ensure that appropriate proceduresthat govern in the conduct of research are observed. However, undergoing these procedures does not necessarily mean that the study was referred to either the British Psychological Society code of conduct (UOG) or the Nigerian National Code for Health Research as the reasons are obvious. First, no part of this study was expected to cause any harm to the participants, although should there be any form of harm the researcher refered the participant for appropriate place where such concern will be taken care.

However the researcher employed rigorous procedure to obtain permission for the study from participating Hospital in Nigeria. In addition, complete information regarding the study was provided to the participants before asking for their permission and consent to participate in the study. More so participant's data and personal information (e.g. name, address, and some other important personal information was not demanded from the participants to indicate in the questionnaire. Although their telephone number and Name were required for the follow up Phase 2 in a separate sheet for only those patients who wish to participate for easy accessibility of their contact.However other participants' information as contained in the self-reported questionnaire was not only carefully and respectfully protected, but was coded, disguised and after the study was locked in a secure box and will be burnt after five years of completion of the study.

According to Barker, Pistrang and Elliot(1994 p.186), ethical problems in research will arise when the participants understanding of the research issues and procedure is limited, when informed consent becomes difficult in a study that included children and adults who are not fully competent to make their own decisions or in research that involve complicated trials in medicine. Accordingly, the international council of Nurses (ICN, 2003) cited by (Parahoo 2006, P.117) pointed out that informed consent is a process by which researcher ensure that prospective participants understand the potential risks and benefits of participating in a study, informed about their rights to withdraw from the study at any time without any legal prosecution, and that this information is presented before the beginning of the study in a manner that is free from coercion. In addition, Dempsey and Dempsey (2000 P. 120) maintained that the researcher must demonstrate anonymity of participants by ensuring that not only will their identification not be disclosed, but none of their responses will be linked to them. Second, Dempsey and Dempsey (2000 p. 126) also argued that with regard to confidentiality the researcher must assure subjects that their identities and their responses must be safeguarded from public disclosure. On all these counts, the current study fulfilled the international recommendation for the proper and ideal conduct of a social research. As was stated in the pages above, proper permission was obtained from the authorities of participating hospitals and from the participants directly before beginning data collection, (consent) and after detailed information of the research issue process was known (consent). Second, data was collected with an anonymous questionnaire with participants' personal identitymissing, not included or coded beyond any form of linking it to the original owners (anonymity). Third, data after collection was placed and secured in a locked box which was assessable only to the researcher and to the supervisory team approximately within 5years of completion of the study, it will be brought out from the secured box and be burnt completely (confidentiality).

5.3 Chapter Summary

This chapter described the survey and instruments used in the quantitative component. It also detailed the procedure used during data collection and analysis. It also highlights how quantitative data was collected within this project.

CHAPTER SIX

QUANTITATIVE RESULTS

6.0 Introduction

A sequential mixed methods design has been used to explore and explain socio-cognitive factors associated with psychological health and in particular their differences by gender ethnicity and type of diabetes. The quantitative data collection involved a self-administered questionnaire comprised of sixteen measures detailed in chapter 3 of this thesis. In this chapter, the result from the quantitative analysis ranges of response, Means, Standard deviations, Cross-tabulation, Multivariate tests (MANOVA) and Analysis of variance (ANOVA). All tests are two-tailed and statistical significance (alpha value) is cited at $p = < 0.05$. The quantitative results will also be interepreted based on the three stated research questions guiding this current study which are:

1. What is the pattern of socio-demographic and socio-cognitive factors on diabetic patient's psychological health?
2. To what extent may differences in psychological health (e.g., depression) among diabetic patients in Nigeria be explained by gender, ethnicity and type of diabetes?
3. To what extent may differences in socio-cognitive health (e.g., self-efficacy) among diabetic patients in Nigeria be explained by gender, ethnicity and type of diabetes?

6.1 Sample Description

A total of 486 people with diabetes participated and completed the Questionnaire. The participants had a mean age of (43.3) and a SD= of (11.5) with an age range of 18-34 years 145(29.8%), 34-51 years 279(57.4) and 52 years and above were 68(12.8). More so, the larger proportion was females 344 (70.8%) full demographic details for participants are summarized in table (6.1) below.

Table 6.1 Summary of participants socio-demographic and clinical variables, N =486 (% = percent of valid data)

Characteristic	N	(%)
Age		
18-34	145	29.8
35-51	279	57.4
52- Above	62	12.8
Gender		
Male	142	29.2
Female	344	70.8
Ethnicity		
Hausa/Fulani	105	21.6
Others	104	21.4
Igbo	122	25.1
Yoruba	155	31.9
Type of Diabetes		
Type 1	74	15.2
Type 2	412	84.2
Duration of Diabetes		
1-5 months	100	20.0
6-10 months	216	44.4
Above 10 months	170	35.0
Income		
Low < ₦45,000	230	47.3
Medium ₦45, 000- 150,000	158	32.5
High > ₦150,000	98	20.2
Marital Status		
Single	77	15.8
Married	335	68.9
Separated	1	0.2
Divorced	19	3.9
Widowed	54	11.1
Educational Level		
Primary	47	9.7
Secondary	235	48
University	204	42.0
Where do you Live		
Village	120	24.7
Town	360	78.3
Number of Children		
None	109	22.4
1-4	289	59.5
5 and Above	88	18.1
Religion		
Roman Catholic	169	34.8
Islam	63	13.0
Protestant	216	44.4
Orthodox	25	5.1

None	2	0.4
Others	11	2.3
Occupation		
Unemployed	62	12.8
Civil Servant	169	34.8
Self employed	177	36.4
Student	14	14.0
Others	21	2.1

6.2 Research Question One:

What is the pattern of psychological health as determined by diabetic patients, socio- socio-cognitive and socio-demographic factors?

Table 6.2 below shows the pattern of psychological health (DVs) associated with each of the socio-cognitive and socio-demographic health indictors (IVs). The tables is grouped into two with the first showing the association between socio-cognitive, socio-demographic factors on the prevalence of depression, stress, fatigue, quality of life and life satisfaction. While the second showing the association between socio-cognitive, socio-demographic factors and the prevalence of anxiety ans insomnia. However, the grouping was to accommodate the similarity in each construct that has common discrete categories.

Table 6.2 shows the pattern of psychological health (Depression, stress, Fatigue, Quality of life and Life Satisfaction) associated with socio-cognitive and socio-demographic health indicators.

SOCIO-COGNITIVE & SOCIO-DEMOGHRAPHIC VARIABLES	**PSYCHOLOGICAL HEALTH**														
	Depression			**Stress**			**Fatigue**			**Quality of life**			**Life satisfaction**		
Sense of Coherence	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Comprehensibility	130 **26.7%**	168 **34.6%**	298 **61.3%**	119 **24.5%**	179 **36.8%**	298 **61.3%**	149 **30.7%**	149 **30.7%**	298 **61.3%**	229 **47.1%**	69 **14.2**	298 **61.3%**	223 **45.9%**	75 **15.4%**	298 **61.3%**
Manageability	168 **34.6%**	20 **4.1%**	188 **38.7%**	124 **25.5%**	64 **13.2%**	188 **38.7%**	164 **33.7%**	24 **4.9%**	188 **38.7%**	27 **5.6%**	161 **33.1%**	188 **38.7%**	44 **9.1%**	144 **29.6%**	188 **38.7%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Health Locus of Control	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Internal	112 **23.0%**	165 **34.0%**	277 **57.0%**	101 **20.8%**	176 **36.2%**	277 **57.0%**	141 **29.0%**	136 **28.0%**	277 **57.0%**	194 **39.9%**	83 **17.1%**	277 **57.0%**	208 **42.8%**	69 **14.2%**	277 **57.0%**
External	186 **38.3%**	23 **4.7%**	209 **43.0%**	142 **29.2%**	67 **13.8%**	209 **43.0%**	172 **35.4%**	37 **7.6%**	209 **43.0%**	62 **12.8%**	147 **30.2%**	209 **43.0%**	59 **12.1%**	150 **30.9%**	209 **43.0%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Self-Esteem	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Low	58 **11.9%**	135 **27.8%**	193 **39.7%**	49 **10.1%**	144 **9.6%**	193 **39.7%**	67 **13.8%**	126 **25.9%**	193 **39.7%**	193 **39.7%**	0 **0.0%**	193 **39.7%**	172 **35.4%**	21 **4.3%**	193 **39.7%**

High	240 **49.4%**	53 **10.9%**	293 **60.3%**	194 **39.9%**	99 **20.4%**	293 **60.3%**	246 **50.6%**	47 **9.7%**	293 **60.3%**	63 **13.0%**	230 **47.3%**	293 **60.3%**	95 **19.5%**	198 **40.7%**	293 **60.3%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Coping	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Problem Focus coping	114 **23.5%**	131 **27.0%**	245 **50.4%**	87 **17.9%**	158 **32.5%**	245 **50.4%**	129 **26.5%**	116 **23.9%**	245 **50.4%**	176 **36.2%**	69 **14.2%**	245 **50.4%**	175 **36.0%**	70 **14.4%**	245 **50.4%**
Emotional focus coping	184 **37.9%**	57 **11.7%**	241 **49.6%**	156 **32.1%**	85 **17.5%**	241 **49.6%**	184 **37.9%**	57 **11.7%**	241 **49.6%**	80 **16.5%**	161 **33.1%**	241 **49.6%**	92 **18.9%**	149 **30.7%**	241 **49.6%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Self –efficacy	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Low	61 **12.6%**	168 **34.6%**	229 **47.1%**	68 **14.0%**	161 **33.1%**	229 **47.1%**	83 **17.1%**	146 **30.0%**	229 **47.1%**	212 **43.6%**	17 **3.5%**	229 **47.1%**	191 **39.3%**	38 **7.8%**	229 **47.1%**
High	237 **48.8%**	20 **4.1%**	257 **52.9%**	175 **36.0%**	82 **16.9%**	257 **52.9%**	230 **47.3%**	27 **5.6%**	257 **52.9%**	44 **9.1%**	213 **43.8%**	257 **52.9%**	76 **15.6%**	181 **37.2%**	257 **52.9%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Optimism	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Low	217 **16.7%**	151 **31.1%**	368 **47.8%**	162 **33.3%**	206 **42.4%**	368 **75.7%**	218 **19.5%**	150 **30.9%**	368 **50.1%**	245 **50.4%**	123 **25.3%**	368 **75.7%**	229 **47.1%**	139 **28.6%**	368 **75.7%**
High	81 **44.7%**	37 **7.6%**	118 **52.5. %**	81 **16.7%**	37 **7.6%**	118 **24.3%**	95 **44.9%**	23 **4.7%**	118 **49.6%**	11 **2.3%**	107 **22.0%**	118 **24.3%**	38 **7.8%**	80 **16.5%**	118 **24.3%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Religiosity	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Low	35 **7.2%**	125 **25.7%**	160 **32.9%**	36 **7.4%**	124 **25.5%**	160 **32.9%**	47 **9.7%**	113 **23.3%**	160 **32.9%**	160 **32.9%**	0 **0.0%**	160 **32.9%**	139 **28.6%**	21 **4.3%**	160 **32.9%**
High	263 **54.1%**	63 **13.0%**	326 **67.1%**	207 **42.6%**	119 **24.5%**	326 **67.1%**	266 **54.7%**	60 **12.3%**	326 **67.1%**	96 **19.8%**	230 **47.3%**	326 **67.1%**	38 **7.8%**	80 **16.5%**	118 **24.3%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Negative Rel. coping	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**

Low	261 **53.7%**	33 **6.8%**	294 **60.5%**	181 **37.2%**	113 **23.3%**	294 **60.5%**	254 **52.3%**	40 **8.2%**	294 **60.5%**	84 **17.3%**	210 **43.2%**	294 **60.5%**	116 **23.9%**	178 **36.6%**	294 **60.5%**
High	37 **7.6%**	155 **31.9%**	192 **39.5%**	62 **12.8%**	130 **26.7%**	192 **39.5%**	59 **12.1%**	133 **27.4%**	192 **39.5%**	172 **35.4%**	20 **4.1%**	192 **39.5%**	151 **31.1%**	41 **8.4%**	192 **39.5%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Social Support	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Low	41 **8.4%**	124 **25.5%**	165 **34.0%**	36 **7.4%**	129 **26.5%**	165 **34.0%**	36 **7.4%**	129 **26.5%**	165 **34.0%**	162 **33.3%**	3 **0.6%**	165 **34.0%**	145 **29.8%**	20 **4.1%**	165 **34.0%**
High	257 **52.9%**	64 **13.2%**	321 **66.0%**	207 **42.6%**	114 **23.5%**	321 **66.0%**	207 **42.6%**	114 **23.5%**	321 **66.0%**	94 **19.3%**	227 **46.7%**	321 **66.0%**	122 **25.1%**	199 **40.9%**	321 **66.0%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Ethnicity	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Hausa or Fulani	79 **16.3%**	26 **5.3%**	105 **21.6%**	49 **10.1%**	56 **11.5%**	105 **21.6%**	73 **15.0%**	32 **6.6%**	105 **21.6%**	50 **10.3%**	55 **11.3%**	105 **21.6%**	55 **11.3%**	50 **10.3%**	105 **21.6%**
Others	41 **8.4%**	63 **13.0%**	104 **21.4%**	32 **6.6%**	72 **14.8%**	104 **21.4%**	46 **9.5%**	58 **11.9%**	104 **21.4%**	80 **16.5%**	24 **4.9%**	104 **21.4%**	78 **16.0%**	26 **5.3%**	104 **21.4%**
Igbo	95 **19.5%**	27 **5.6%**	122 **25.1%**	84 **17.3%**	38 **7.8%**	122 **25.1%**	87 **17.9%**	35 **7.2%**	122 **25.1%**	50 **10.3%**	72 **14.8%**	122 **25.1%**	45 **9.3%**	77 **15.8%**	122 **25.1%**
Yoruba	83 **17.1%**	72 **14.8%**	155 **31.9%**	78 **16.0%**	77 **15.8%**	155 **31.9%**	107 **22.0%**	48 **9.9%**	155 **31.9%**	76 **15.6%**	79 **16.3%**	155 **31.9%**	89 **18.3%**	66 **13.6%**	155 **31.9%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Gender	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Male	131 **27.0%**	11 **2.3%**	142 **29.2%**	103 **21.2%**	39 **8.0%**	142 **29.2%**	109 **22.4%**	33 **6.8%**	142 **29.2%**	56 **11.5%**	86 **17.7%**	142 **29.2%**	66 **13.6%**	76 **15.6%**	142 **29.2%**
Female	167 **34.4%**	177 **36.4%**	344 **70.8%**	140 **28.8%**	204 **42.0%**	344 **70.8%**	204 **42.0%**	140 **28.8%**	344 **70.8%**	200 **41.2%**	144 **29.6%**	344 **70.8%**	201 **41.4%**	143 **29.4%**	344 **70.8%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Monthly Income	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**

Low income	68 **14.0%**	162 **33.3%**	230 **47.3%**	73 **15.0%**	157 **32.3%**	230 **47.3%**	97 **20.0%**	133 **27.4%**	230 **47.3%**	190 **39.1%**	40 **8.2%**	230 **47.3%**	190 **39.1%**	40 **8.2%**	230 **47.3%**
Medium income	144 **29.6%**	14 **2.9%**	158 **32.5%**	124 **25.5%**	34 **7.0%**	158 **32.5%**	137 **28.2%**	21 **4.3%**	158 **32.5%**	46 **9.5%**	112 **23.0%**	158 **32.5%**	49 **10.1%**	109 **22.4%**	158 **32.5%**
High income	86 **17.7%**	12 **2.5%**	98 **20.2%**	46 **9.5%**	52 **10.7%**	98 **20.2%**	79 **16.3%**	19 **3.9%**	98 **20.2%**	20 **4.1%**	78 **16.0%**	98 **20.2%**	28 **5.8%**	70 **14.4%**	98 **20.2%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Marital Status	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Single	30 **6.2%**	47 **9.7%**	77 **15.8%**	32 **6.6%**	45 **9.3%**	77 **15.8%**	46 **9.5%**	31 **6.4%**	77 **15.8%**	60 **12.3%**	17 **3.5%**	77 **15.8%**	70 **14.4%**	7 **1.4%**	77 **15.8%**
Married	243 **50.0%**	92 **18.9%**	335 **68.9%**	177 **36.4%**	158 **32.5%**	335 **68.9%**	232 **47.7%**	103 **21.2%**	335 **68.9%**	129 **26.5%**	206 **42.4%**	335 **68.9%**	154 **31.7%**	181 **37.2%**	335 **68.9%**
Separated	0 **0.0%**	1 **0.2%**	1 **0.2%**	0 **0.0%**	1 **0.2%**	1 **0.2%**	0 **0.0%**	1 **0.2%**	1 **0.2%**	1 **0.2%**	0 **0.0%**	1 **0.2%**	1 **0.2%**	0 **0.0%**	1 **0.2%**
Divorced	10 **2.1%**	9 **1.9%**	19 **3.9%**	12 **2.5%**	7 **1.4%**	19 **3.9%**	13 **2.7%**	6 **1.2%**	19 **3.9%**	13 **2.7%**	6 **1.2%**	19 **3.9%**	10 **2.1%**	9 **1.9%**	19 **3.9%**
Widowed	15 **3.1%**	39 **8.0%**	54 **11.1%**	22 **4.5%**	32 **6.6%**	54 **11.1%**	22 **4.5%**	32 **6.6%**	54 **11.1%**	53 **10.9%**	1 **0.2%**	54 **11.1%**	32 **6.6%**	22 **4.5%**	54 **11.1%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Age	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
18-34	63 **13.0%**	82 **16.9%**	145 **29.8%**	45 **9.3%**	100 **20.6%**	145 **29.8%**	92 **18.9%**	53 **10.9%**	145 **29.8%**	105 **21.6%**	40 **8.2%**	145 **29.8%**	118 **24.3%**	27 **5.6%**	145 **29.8%**
35-51	215 **44.2%**	64 **13.2%**	279 **57.4%**	159 **32.7%**	120 **24.7%**	279 **57.4%**	199 **40.9%**	80 **16.5%**	279 **57.4%**	93 **19.1%**	186 **38.3%**	279 **57.4%**	110 **22.6%**	169 **34.8%**	279 **57.4%**
52 and Above	20 **4.1%**	42 **8.6%**	62 **12.8%**	39 **8.0%**	23 **4.7%**	62 **12.8%**	22 **4.5%**	40 **8.2%**	62 **12.8%**	58 **11.9%**	4 **0.8%**	62 **12.8%**	39 **8.0%**	23 **4.7%**	62 **12.8%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Occupation	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Unemployed	15 **3.1%**	47 **9.7%**	62 **12.8%**	11 **2.3%**	51 **10.5%**	62 **12.8%**	23 **4.7%**	39 **8.0%**	62 **12.8%**	36 **7.4%**	26 **5.3%**	62 **12.8%**	41 **8.4%**	21 **4.3%**	62 **12.8%**

Civil Servants	161 **33.1%**	8 **1.6%**	169 **34.8%**	117 **24.1%**	52 **10.7%**	169 **34.8%**	153 **31.5%**	16 **3.3%**	169 **34.8%**	50 **10.3%**	119 **24.5%**	169 **34.8%**	61 **12.6%**	108 **22.2%**	169 **34.8%**
Self-employed	78 **16.0%**	99 **20.4%**	177 **36.4%**	79 **16.3%**	98 **20.2%**	177 **36.4%**	97 **20.0%**	80 **16.5%**	177 **36.4%**	110 **22.6%**	67 **13.8%**	177 **36.4%**	03 **21.2%**	74 **15.2%**	177 **36.4%**
Student	34 **7.0%**	34 **7.0%**	68 **14.0%**	36 **7.4%**	32 **6.6%**	68 **14.0%**	39 **8.0%**	29 **6.0%**	68 **14.0%**	60 **12.3%**	8 **1.6%**	68 **14.0%**	62 **12.8%**	6 **1.2%**	68 **14.0%**
Others	10 **2.1%**	0 **0.0%**	10 **2.1%**	0 **0.0%**	10 **2.1%**	10 **2.1%**	1 **0.2%**	9 **1.9%**	10 **2.1%**	0 **0.0%**	10 **2.1%**	10 **2.1%**	0 **0.0%**	10 **2.1%**	10 **2.1%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Educational Status	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Primary Education	34 **7.0%**	13 **2.7%**	47 **9.7%**	16 **3.3%**	31 **6.4%**	47 **9.7%**	36 **7.4%**	11 **2.3%**	47 **9.7%**	24 **4.9%**	23 **4.7%**	47 **9.7%**	17 **3.5%**	30 **6.2%**	47 **9.7%**
Secondary Education	107 **22.0%**	128 **26.3%**	235 **48.4%**	106 **21.8%**	129 **26.5%**	235 **48.4%**	128 **26.3%**	107 **22.0%**	235 **48.4%**	163 **33.5%**	72 **14.8%**	235 **48.4%**	157 **32.3%**	78 **16.0%**	235 **48.4%**
University Education	157 **32.3%**	47 **9.7%**	204 **42.0%**	121 **24.9%**	83 **17.1%**	204 **42.0%**	149 **30.7%**	55 **11.3%**	204 **42.0%**	69 **14.2%**	135 **27.8%**	204 **42.0%**	93 **19.1%**	111 **22.8%**	204 **42.0%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Religion	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Roman Catholic	112 **23.0%**	57 **11.7%**	169 **34.8%**	105 **21.6%**	64 **13.2%**	169 **34.8%**	113 **23.3%**	56 **11.5%**	169 **34.8%**	91 **18.7%**	78 **16.0%**	169 **34.8%**	95 **19.5%**	74 **15.2%**	169 **34.8%**
Islam	51 **10.5%**	12 **2.5%**	63 **13.0%**	29 **6.0%**	34 **7.0%**	63 **13.0%**	42 **8.6%**	21 **4.3%**	63 **13.0%**	31 **6.4%**	32 **6.6%**	63 **13.0%**	29 **6.0%**	34 **7.0%**	63 **13.0%**
Protestant	120 **24.7%**	96 **19.8%**	216 **44.4%**	103 **21.2%**	113 **23.3%**	216 **44.4%**	127 **26.1%**	89 **18.3%**	216 **44.4%**	116 **23.9%**	100 **20.6%**	216 **44.4%**	112 **23.0%**	104 **21.4%**	216 **44.4%**
Orthodox	15 **3.1%**	10 **2.1%**	25 **5.1%**	6 **1.2%**	19 **3.9%**	25 **5.1%**	18 **3.7%**	7 **1.4%**	25 **5.1%**	18 **3.7%**	7 **1.4%**	25 **5.1%**	18 **3.7%**	7 **1.4%**	25 **5.1%**
None	0 **0.0%**	2 **0.4%**	2 **0.4%**	0 **0.0%**	2 **0.4%**	2 **0.4%**	2 **0.4%**	0 **0.0%**	2 **0.4%**	0 **0.0%**	2 **0.4%**	2 **0.4%**	2 **0.4%**	0 **0.0%**	2 **0.4%**
Others	0 **0.0%**	11 **2.3%**	11 **2.3%**	0 **0.0%**	11 **2.3%**	11 **2.3%**	11 **2.3%**	0 **0.0%**	11 **2.3%**	0 **0.0%**	11 **2.3%**	11 **2.3%**	11 **2.3%**	0 **0.0%**	11 **2.3%**

Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Types of Diabetes	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Type 1	30 **6.2%**	44 **9.1%**	74 **15.2%**	28 **5.8%**	46 **9.5%**	74 **15.2%**	43 **8.8%**	31 **6.4%**	74 **15.2%**	55 **11.3%**	19 **3.9%**	74 **15.2%**	65 **13.4%**	9 **1.9%**	74 **15.2%**
Type 2	268 **55.1%**	144 **29.6%**	412 **84.8%**	215 **44.2%**	197 **40.5%**	412 **84.8%**	270 **55.6%**	142 **29.2%**	412 **84.8%**	201 **41.4%**	211 **43.4%**	412 **84.8%**	202 **41.6%**	210 **43.2%**	412 **84.8%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Duration of Diabetes	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
0-5 months	59 **12.1%**	41 **8.4%**	100 **20.6%**	59 **12.1%**	41 **8.4%**	100 **20.6%**	66 **13.6%**	34 **7.0%**	100 **20.6%**	66 **13.6%**	34 **7.0%**	100 **20.6%**	62 **12.8%**	38 **7.8%**	100 **20.6%**
6 months and above	239 **49.2%**	147 **30.2%**	386 **79.4%**	184 **37.9%**	202 **41.6%**	386 **79.4%**	247 **50.8%**	139 **28.6%**	386 **79.4%**	190 **39.1%**	196 **40.3%**	386 **79.4%**	205 **37.2%**	181 **42.2%**	386 **79.4%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **50.0%**	219 **50.0%**	486 **100.0%**
Where do you Live	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
Village	74 **15.2%**	46 **9.5%**	120 **24.7%**	66 **13.6%**	54 **11.1%**	120 **24.7%**	57 **11.7%**	63 **13.0%**	120 **24.7%**	67 **13.8%**	53 **10.9%**	120 **24.7%**	53 **10.9%**	67 **13.8%**	120 **24.7%**
Town	224 **46.1%**	142 **29.2%**	366 **75.3%**	177 **36.4%**	189 **38.9%**	366 **75.3%**	256 **52.7%**	110 **22.6%**	366 **75.3%**	189 **38.9%**	177 **36.4%**	366 **75.3%**	214 **44.0%**	152 **31.3%**	366 **75.3%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **100.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**
Number of Children	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**	**Low**	**High**	**Total**
None	33 **6.8%**	76 **15.6%**	109 **22.4%**	34 **7.0%**	75 **15.4%**	109 **22.4%**	53 **10.9%**	56 **11.5%**	109 **22.4%**	94 **19.3%**	15 **3.1%**	109 **22.4%**	104 **21.4%**	5 **1.0%**	109 **22.4%**
1-4 children	223 **45.9%**	66 **13.6%**	289 **59.5%**	172 **35.4%**	117 **24.1%**	289 **59.5%**	199 **40.9%**	90 **18.5%**	289 **59.5%**	107 **22.0%**	182 **37.4%**	289 **59.5%**	116 **23.9%**	173 **35.6%**	289 **59.5%**
5 children & above	42 **8.6%**	46 **9.5%**	88 **18.1%**	37 **7.6%**	51 **10.5%**	88 **18.1%**	61 **12.6%**	27 **5.6%**	88 **18.1%**	55 **11.3%**	33 **6.8%**	88 **18.1%**	47 **9.7%**	41 **8.4%**	88 **18.1%**
Total	298 **61.3%**	188 **38.7%**	486 **100.0%**	243 **50.0%**	243 **50.0%**	486 **1 00.0%**	313 **64.4%**	173 **35.6%**	486 **100.0%**	256 **52.7%**	230 **47.3%**	486 **100.0%**	267 **54.9%**	219 **45.1%**	486 **100.0%**

Table 6.3 shows the pattern of Psychological health (Anxiety and Insomnia) associated with each of the socio-cognitive and socio-demographic health indicators.

SOCIO-COGNITIVE & SOCIO-DEMOGHRAPHIC VARIABLES	PSYCHOLOGICAL HEALTH								
	Anxiety				Insomnia				
Sense of Coherence	Mild	Moderate	Severe	Total	Absence	Sub-threshold	Moderate	Severe	Total
Comprehensibility	76 **15.6%**	140 **28.8%**	82 **16.9%**	298 **61.3%**	43 **8.8%**	98 **20.2%**	86 **17.7%**	71 **14.6%**	298 **61.3%**
Manageability	174 **35.8%**	0 **0.0%**	14 **2.9%**	188 **38.7%**	110 **22.6%**	13 **2.7%**	10 **2.1%**	55 **11.3%**	188 **38.7%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Health Locus of Control	Mild	Moderate	Severe	Total	Absence	Sub-threshold	Moderate	Severe	Total
Internal	86 **17.7%**	128 **26.3%**	63 **13.0%**	277 **57.0%**	37 **7.6%**	71 **14.6%**	82 **16.9%**	87 **17.9%**	277 **57.0%**
External	164 **33.7%**	12 **2.5%**	33 **6.8%**	209 **43.0%**	116 **23.9%**	40 **8.2%**	14 **2.9%**	39 **8.0%**	209 **43.0%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Self-Esteem	Mild	Moderate	Severe	Total	Absence	Sub-threshold	Moderate	Severe	Total
Low	10 **2.1%**	107 **22.0%**	76 **15.6%**	193 **39.7%**	3 **0.6%**	65 **13.4%**	69 **14.2%**	56 **11.5%**	193 **39.7%**
High	240 **49.4%**	33 **6.8%**	20 **4.1%**	293 **60.3%**	150 **30.9%**	46 **9.5%**	27 **5.6%**	70 **14.4%**	293 **60.3%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Coping	Mild	Moderate	Severe	Total	Absence	Sub-threshold	Moderate	Severe	Total
Problem Focus coping	93 **19.1%**	87 **17.9%**	65 **13.4%**	245 **50.4%**	55 **11.3%**	42 **8.6%**	82 **16.9%**	66 **13.6%**	245 **50.4%**
Emotional focus coping	157 **32.3%**	53 **10.9%**	31 **6.4%**	241 **49.6%**	98 **20.2%**	69 **14.2%**	14 **2.9%**	60 **12.3%**	241 **49.6%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Self –efficacy	Mild	Moderate	Severe	Total	Absence	Sub-threshold	Moderate	Severe	Total
Low	10	140	79	229	6	98	69	56	229

	2.1%	**28.8%**	**16.3%**	**47.1%**	**1.2%**	**20.2%**	**14.2%**	**11.5%**	**47.1%**
High	240 **49.4%**	0 **0.0%**	17 **3.5%**	257 **52.9%**	147 **30.2%**	13 **2.7%**	27 **5.6%**	70 **14.4%**	257 **52.9%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	**153** **31.5%**	**111** **22.8%**	**96** **19.8%**	**126** **25.9%**	**486** **100.0%**
Optimism	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
Low	155 **19.5%**	123 **25.3%**	90 **18.5%**	368 **63.4%**	95 **19.5%**	94 **19.3%**	96 **11.9%**	83 **17.1%**	368 **75.7%**
High	95 **31.9%**	17 **3.5%**	6 **1.2%**	118 **36.6%**	58 **19.8%**	17 **3.5%**	0 **0.0%**	43 **8.8%**	118 **24.3%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Religiosity	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
Low	4 **0.8%**	90 **18.5%**	66 **13.6%**	160 **32.9%**	0 **0.0%**	49 **10.1%**	69 **14.2%**	42 **8.6%**	160 **32.9%**
High	246 **50.6%**	50 **10.3%**	30 **6.2%**	326 **67.1%**	153 **31.5%**	62 **12.8%**	27 **5.6%**	84 **17.3%**	326 **67.1%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Negative Religious coping	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
Low	246 **50.6%**	20 **4.1%**	28 **5.8%**	294 **60.5%**	150 **30.9%**	26 **5.3%**	34 **7.0%**	84 **17.3%**	294 **60.5%**
High	4 **0.8%**	120 **24.7%**	68 **14.0%**	192 **39.5%**	3 **0.6%**	85 **17.5%**	62 **12.8%**	42 **8.6%**	192 **39.5%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	**153** **31.5%**	**111** **22.8%**	**96** **19.8%**	**126** **25.9%**	**486** **100.0%**
Social Support	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
Low	10 **2.1%**	91 **18.7%**	64 **13.2%**	165 **34.0%**	6 **1.2%**	42 **8.6%**	62 **12.8%**	55 **11.3%**	165 **34.0%**
High	240 **49.4%**	49 **10.1%**	32 **6.6%**	321 **66.0%**	147 **30.2%**	69 **14.2%**	34 **7.0%**	71 **14.6%**	321 **66.0%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Ethnicity	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
Hausa or Fulani	60 **12.3%**	24 **4.9%**	21 **4.3%**	105 **21.6%**	37 **7.6%**	13 **2.7%**	17 **3.5%**	38 **7.8%**	105 **21.6%**
Others	35 **7.2%**	39 **8.0%**	30 **6.2%**	104 **21.4%**	24 **4.9%**	11 **2.3%**	40 **8.2%**	29 **6.0%**	104 **21.4%**
Igbo	78 **16.0%**	28 **5.8%**	16 **3.3%**	122 **25.1%**	43 **8.8%**	27 **5.6%**	28 **5.8%**	24 **4.9%**	122 **25.1%**
Yoruba	77 **15.8%**	49 **10.1%**	29 **6.0%**	155 **31.9%**	49 **10.1%**	60 **12.3%**	11 **2.3%**	35 **7.2%**	155 **31.9%**

Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Gender	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
Male	93 **19.1%**	19 **3.9%**	30 **6.2%**	142 **29.2%**	67 **13.8%**	15 **3.1%**	6 **1.2%**	54 **11.1%**	142 **29.2%**
Female	157 **32.3%**	121 **24.9%**	66 **13.6%**	344 **70.8%**	86 **17.7%**	96 **19.8%**	90 **18.5%**	72 **14.8%**	344 **70.8%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Monthly Income	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
Low income	40 **8.2%**	126 **25.9%**	64 **13.2%**	230 **47.3%**	6 **1.2%**	85 **17.5%**	75 **15.4%**	64 **13.2%**	230 **47.3%**
Medium income	127 **26.1%**	8 **1.6%**	23 **4.7%**	158 **32.5%**	80 **16.5%**	13 **2.7%**	10 **2.1%**	55 **11.3%**	158 **32.5%**
High income	83 **17.1%**	6 **1.2%**	9 **1.9%**	98 **20.2%**	67 **13.8%**	13 **2.7%**	11 **2.3%**	7 **1.4%**	98 **20.2%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Marital Status	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
Single	19 **3.9%**	28 **5.8%**	30 **6.2%**	77 **15.8%**	5 **1.0%**	22 **4.5%**	19 **3.9%**	31 **6.4%**	77 **15.8%**
Married	220 **45.3%**	65 **13.4%**	50 **10.3%**	335 **68.9%**	141 **29.0%**	36 **7.4%**	70 **14.4%**	88 **18.1%**	335 **68.9%**
Separated	0 **0.0%**	0 **0.0%**	1 **0.2%**	1 **0.2%**	0 **0.0%**	0 **0.0%**	0 **0.0%**	1 **0.2%**	1 **0.2%**
Divorced	5 **1.0%**	11 **2.3%**	3 **0.6%**	19 **3.9%**	3 **0.6%**	6 **1.2%**	7 **1.4%**	3 **0.6%**	19 **3.9%**
Widowed	6 **1.2%**	36 **7.4%**	12 **2.5%**	54 **11.1%**	4 **0.8%**	47 **9.7%**	0 **0.0%**	3 **0.6%**	54 **11.1%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Age	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
18-34	60 **12.3%**	23 **4.7%**	62 **12.8%**	145 **29.8%**	27 **5.6%**	29 **6.0%**	36 **7.4%**	53 **10.9%**	145 **29.8%**
35-51	184 **37.9%**	83 **17.1%**	12 **2.5%**	279 **57.4%**	120 **24.7%**	41 **8.4%**	59 **12.1%**	59 **12.1%**	279 **57.4%**
52 and Above	6 **1.2%**	34 **7.0%**	22 **4.5%**	62 **12.8%**	6 **1.2%**	41 **8.4%**	1 **0.2%**	14 **2.9%**	62 **12.8%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Occupation	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
Unemployed	10	32	20	62	4	29	8	21	62

	2.1%	**6.6%**	**4.1%**	**12.8%**	**0.8%**	**6.0%**	**1.6%**	**4.3%**	**12.8%**
Civil Servants	150 **30.9%**	0 **0.0%**	19 **3.9%**	169 **34.8%**	110 **22.6%**	7 **1.4%**	16 **3.3%**	36 **7.4%**	169 **34.8%**
Self-employed	71 **14.6%**	83 **17.1%**	23 **4.7%**	177 **36.4%**	33 **6.8%**	60 **12.3%**	39 **8.0%**	45 **9.3%**	177 **36.4%**
Student	9 **1.9%**	25 **5.1%**	34 **7.0%**	68 **14.0%**	6 **1.2%**	14 **2.9%**	24 **4.9%**	24 **4.9%**	68 **14.0%**
Others	10 **2.1%**	0 **0.0%**	0 **0.0%**	10 **2.1%**	0 **0.0%**	1 **0.2%**	9 **1.9%**	0 **0.0%**	10 **2.1%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Educational Status	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
Primary Education	31 **6.4%**	5 **1.0%**	11 **2.3%**	47 **9.7%**	19 **3.9%**	7 **1.4%**	1 **0.2%**	20 **4.1%**	47 **9.7%**
Secondary Education	75 **15.4%**	110 **22.6%**	50 **10.3%**	235 **48.4%**	51 **10.5%**	70 **14.4%**	57 **11.7%**	57 **11.7%**	235 **48.4%**
University Education	144 **29.6%**	25 **5.1%**	35 **7.2%**	204 **42.0%**	83 **17.1%**	34 **7.0%**	38 **7.8%**	49 **10.1%**	204 **42.0%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Religion	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
Roman Catholic	88 **18.1%**	64 **13.2%**	17 **3.5%**	169 **34.8%**	39 **8.0%**	32 **6.6%**	62 **12.8%**	36 **7.4%**	169 **34.8%**
Islam	33 **6.8%**	18 **3.7%**	12 **2.5%**	63 **13.0%**	19 **3.9%**	15 **3.1%**	4 **0.8%**	25 **5.1%**	63 **13.0%**
Protestant	105 **21.6%**	51 **10.5%**	60 **12.3%**	216 **44.4%**	85 **17.5%**	60 **12.3%**	25 **5.1%**	46 **9.5%**	216 **44.4%**
Orthodox	11 **2.3%**	7 **1.4%**	7 **1.4%**	25 **5.1%**	10 **2.1%**	4 **0.8%**	5 **1.0%**	6 **1.2%**	25 **5.1%**
None	2 **0.4%**	0 **0.0%**	0 **0.0%**	2 **0.4%**	0 **0.0%**	0 **0.0%**	0 **0.0%**	2 **0.4%**	2 **0.4%**
Others	11 **2.3%**	0 **0.0%**	0 **0.0%**	11 **2.3%**	0 **0.0%**	0 **0.0%**	0 **0.0%**	11 **2.3%**	11 **2.3%0**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Types of Diabetes	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
Type 1	20 **4.1%**	24 **4.9%**	30 **6.2%**	74 **15.2%**	7 **1.4%**	19 **3.9%**	15 **3.1%**	33 **6.8%**	74 **15.2%**
Type 2	230 **47.3%**	116 **23.9%**	66 **13.6%**	412 **84.8%**	146 **30.0%**	92 **18.9%**	81 **16.7%**	93 **19.1%**	412 **84.8%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**

Duration of Diabetes	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
0-5 months	61 **12.6%**	29 **6.0%**	10 **2.1%**	100 **20.6%**	31 **6.4%**	9 **1.9%**	43 **8.8%**	17 **3.5%**	100 **20.6%**
6 months and above	189 **38.9%**	111 **22.8%**	86 **17.7%**	386 **79.4%**	122 **25.1%**	102 **21.0%**	53 **10.9%**	109 **22.4%**	386 **79.4%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Where do you Live	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
Village	50 **10.3%**	45 **9.3%**	25 **5.1%**	120 **24.7%**	30 **6.2%**	50 **10.3%**	19 **3.9%**	21 **4.3%**	120 **24.7%**
Town	200 **41.2%**	95 **19.5%**	71 **14.6%**	366 **75.3%**	123 **25.3%**	61 **12.6%**	77 **15.8%**	105 **21.6%**	366 **75.3%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**
Number of Children	**Mild**	**Moderate**	**Severe**	**Total**	**Absence**	**Sub-threshold**	**Moderate**	**Severe**	**Total**
None	18 **3.7%**	55 **11.3%**	36 **7.4%**	109 **22.4%**	3 **0.6%**	26 **5.3%**	47 **9.7%**	33 **6.8%**	109 **22.4%**
1-4 children	194 **39.9%**	45 **9.3%**	50 **10.3%**	289 **59.5%**	135 **27.8%**	40 **8.2%**	41 **8.4%**	73 **15.0%**	289 **59.5%**
5 children & above	38 **7.8%**	40 **8.2%**	10 **2.1%**	88 **18.1%**	15 **3.1%**	45 **9.3%**	8 **1.6%**	20 **4.1%**	88 **18.1%**
Total	250 **51.4%**	140 **28.8%**	96 **19.8%**	486 **100.0%**	153 **31.5%**	111 **22.8%**	96 **19.8%**	126 **25.9%**	486 **100.0%**

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6.3 The Summary of the Main Findings for Question One

The findings of the research question one, showed the pattern of psychological health indicators as determind by socio-cogntive and socio-demographic factors of the respondents.

In terms of diabetes patients with manageability sense of coherence, external locus of control, emotional focus-coping, and higher score in self-esteem, self-efficacy, optimism, religiosity, social support, and lower on negative religiosity reported low stress, depression, mild anxiety, absence of insomnia and fatigue and higher quality of life and life satisfaction. Being a type 2 diabetes, with a medium income, married, age bracket between 35-51 year old, civil servant, having a university degree, with duration of diabetic for 6 months and above, having 1-4 childern, associated with lower depression, stress, fatigue, mild anxiety, absence of insomnia and higher quality of life and life satisfaction.

Patients who belong to protestant religious faith and who lived in town reported mild anxiety, absence of insomnia, higher stress, and low level of depression, fatigue, lower quality of life and were dissatisfied with life.

In terms of ethnic groups patients who are Igbo reported low depression stress and mild anxiety while patients who are Yourba ethnic group reported lower fatigue, absence of insomnia and were dissatisfaction with life whereas patients who are of ‘Others’ ethnic groups reported low quality of life.On genders female’s diabetes patients reported higher stress and depressioin, mild anxiety sub-threshold of insomnia, lower fatigue, quality of life and lower life satisfaction wheras their male counterparts reported lower stress and depression, higher in fatigue, quality of life and life satisfaction.

6.4 Research Question Two: (Psychological health)

To what extent may differences inpsychological health (e.g., depression) among diabetic patients in Nigeria be explained by gender, ethnicity and type of diabetes?

A multivariate analysis of variance (MANOVA) was used to address the research question above. MANOVA is considered appropriate as it is a test that includes several dependent variables in a single analysis and the general factors of psychological health in this study was assessed using a number of measures. Secondly, it can protect against Type I errors that might occur if multiple ANOVA's were conducted independently. Additionally, it can reveal differences not discovered by ANOVA tests.

In other words the analysis combinesall the dependent variables (DVs) into one single variables and looks to see if there are any differences between the independent variables (gender, ethnicity, and type of diabetes) on the combined variables. More so, the rationale for combining the DVs (Psychological health indicators) is that they are all linked and are all aspects that may be affected by the disease. From the result of the MANOVA below it looks as though almost all the interactions and main effects are significant. However, the result interpretation will begin with the significant interaction first then followed with the main effects.

The assumptions underlying MANOVA were assessed1.) *The Multicollinearity (correlations between variables should not be too high)*. According to Tabachnick & Fidell, (2007) Correlations should be lower than 0.9 and MANOVA works well with moderately correlated (~0.6) DVs (See Appendix: K). 2.) *DVs should be on an interval or ratio scale*. This assumption is not violated. 3.)*The number of cases in each cell should be greater than the number of DVs (7)*, this assumption is not violated;4).*There should be homogeneity of variance-covariance matrices.*Alsothe homogeneity of covariance is usually tested using Box's test but this was not used in this case as it can give a spurious significant result with large samples. The homogeneity of variance was tested using Levene's test, andthe Levene's test is significant for all DV's and so the assumption of homogeneity of variance is violated; 5.)*The data should be normally distributed*. Almost all values of Skewnessn and Kurtosis divided by the appropriate SE, for all DVs, were greater than 1.96.The assumption of normality thus is violated.

Given the violation of some of the parametric assumptions, Pillai's Trace was used as the test statistic as it is the most robust to such violations (Field, 2009). However, the results are interpreted with caution. More so, a two-stage approach was employed in the data analysis and interpretation. That is, abroad (MANOVA) with combined DVs then followed by detailed (ANOVAs) which looked at individual DVs in more detail.

Table 6.4 **Shows a 2x4x2 MANOVA of the main and interaction effect of gender, ethnicity and type of type diabetes on the combined DV (psychological health).**

Effect	Value	F	Hypothesis Df	Error df	Sig	Partial Eta Squared
Gender	.789	17.736	7.000	464.000	.000	.211
Ethnicity	.167	3.933	21.000	1398.000	.000	.056
Type of diabetes	.214	18.076	7.000	464.000	.000	.214
Gender * Ethnicity	.071	1.609	21.000	1398.000	.040	.024
Gender * Type Diabetes	.076	5.444	7.000	464.000	.000	.076
Ethnicity * Type Diabetes	.089	2.032	21.000	1398.000	.004	.030
Gender * Ethnicity * Type Diabetes	.071	1.604	21.000	1398.000	.041	.024

a. Design: Intercept + Gender + Ethnicity + TypeDiabetes + Gender * Ethnicity + Gender * TypeDiabetes + Ethnicity * TypeDiabetes + Gender * Ethnicity * TypeDiabetes
b. Exact statistic
c. The statistic is an upper bound on F that yields a lower bound on the significance level.

The output of the MANOVA shown in table 7.4 above indicates that, there was a significant three-way interaction between gender, ethnicity and the type of diabetes (F(21,1398) = 1.604, p = 0.041; Pillai's Trace = 0.071; partial η^2 = 0.024). The result further revealed that there was a significant two-way interaction between Ethnicity and type of diabetes (F(21,1398) = 2.032, p = 0.004; Pillai's Trace = 0.089; partial η^2 = 0.030). More so, gender and type of diabetes have significant two-way interaction between each other (F (7,464) = 5.444, p = 0.00; Pillai's Trace = 0.076; partial η^2 = 0.076). Furthermore, there was significant two-way interaction between gender and ethnicity (F(21,1398) = 1.609, p = 0.040; Pillai's Trace = 0.071; partial η^2 = 0.024). The result from the table also revealed that there was a significant main effect of the Type of diabetes (F(7,464) = 18.076, p< 0.0005; Pillai's Trace = 0.214; partial η^2 = 0.214). In addition there was significant main effect of ethnicity (F(21,1398) = 3.933, p< 0.000; Pillai's Trace = 0.167; partial η^2 = 0.056). Finally, it further showed that there was significant main effect of gender (F(7,464) = 17.736, p< 0.000; Pillai's Trace = 0.211; partial η^2 = 0.211).

In sum of the output of the MANOVA in table 6.4 the Partial Eta Squared value was compared to look out for the Partial η^2 that indicate the greatest proportion of variance explained by an IV in the combined DV. So for the psychological health, type of diabetes explains more of the variance remaining (after excluding the variance attributable to other variables) 21.4% than gender 21.1%, which, in turn, explains more of the variance than ethnicity 5.6%.

The table 6.5below is a summary of the 2x4x2 multiple analysis of variance (ANOVA) showing the main and interaction effect of gender, ethnicity and type of diabetes on each DVs. Bascially it is a breakdown of the analysis in table 6.4above, but with each DV (Anxiety, Stress, etc) separated out. In other words instead of one combined DVs result, is then seven (one for each DV). However, with this it gives a specific DV that showed the main and ineteraction effect with the IVs gender, ethnicity and type of diabetes. A Bonferroni was applied to give an alpha value of $p < 0.007$.

Table 6.5 Summary of (ANOVAs) showing the breakdown of main and interaction effect of gender, ethnicity and type of diabetes for each of the DVs psychological health.

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Gender	**Anxiety**	226.247	1	226.247	7.333	.007	.015
	Insomnia	1050.207	1	1050.207	25.579	.000	.052
	Stress	2218.372	1	2218.372	63.792	.000	.120
	Depression	24256.952	1	24256.952	63.570	.000	.119
	Fatigue	2757.108	1	2757.108	38.477	.000	.076
	Quality of life	4068.046	1	4068.046	16.291	.000	.033
	Life satisfaction	467.511	1	467.511	12.412	.000	.026
Ethnicity	**Anxiety**	670.776	3	223.592	7.247	.000	.044
	Insomnia	1135.311	3	378.437	9.217	.000	.056
	Stress	1200.510	3	400.170	11.507	.000	.068
	Depression	10640.563	3	3546.854	9.295	.000	.056
	Fatigue	1503.800	3	501.267	6.995	.000	.043
	Quality of life	7038.537	3	2346.179	9.395	.000	.057
	Life satisfaction	561.782	3	187.261	4.971	.002	.031
Type of diabetes	**Anxiety**	1903.286	1	1903.286	61.686	.000	.116
	Insomnia	2396.188	1	2396.188	58.362	.000	.110
	Stress	1496.609	1	1496.609	43.037	.000	.084
	Depression	18854.134	1	18854.134	49.411	.000	.095
	Fatigue	1452.419	1	1452.419	20.269	.000	.041
	Quality of life	6350.765	1	6350.765	25.432	.000	.051
	Life satisfaction	1808.444	1	1808.444	48.011	.000	.093
Gender * Ethnicity	**Anxiety**	90.292	3	30.097	.975	.404	.006
	Insomnia	102.898	3	34.299	.835	.475	.005
	Stress	49.782	3	16.594	.477	.698	.003
	Depression	569.331	3	189.777	.497	.684	.003
	Fatigue	143.043	3	47.681	.665	.574	.004
	Quality of life	781.055	3	260.352	1.043	.373	.007
	Life satisfaction	106.466	3	35.489	.942	.420	.006
Gender * Type of diabetes	**Anxiety**	177.822	1	177.822	5.763	.017	.012
	Insomnia	354.037	1	354.037	8.623	.003	.018
	Stress	239.541	1	239.541	6.888	.009	.014
	Depression	17.977	1	17.977	.047	.828	.000
	Fatigue	.014	1	.014	.000	.989	.000
	Quality of life	523.103	1	523.103	2.095	.148	.004
	Life satisfaction	.492	1	.492	.013	.909	.000
Ethnicity * Type of diabetes	**Anxiety**	557.630	3	185.877	6.024	.000	.037
	Insomnia	301.405	3	100.468	2.447	.063	.015
	Stress	222.063	3	74.021	2.129	.096	.013
	Depression	1090.477	3	363.492	.953	.415	.006
	Fatigue	656.610	3	218.870	3.054	.028	.019

	Quality of life	1335.566	3	445.189	1.783	.150	.011
	Life satisfaction	80.297	3	26.766	.711	.546	.005
Gender * Ethnicity * Type of diabetes	**Anxiety**	372.672	3	124.224	4.026	.008	.025
	Insomnia	356.085	3	118.695	2.891	.035	.018
	Stress	132.772	3	44.257	1.273	.283	.008
	Depression	6464.228	3	2154.743	5.647	.001	.035
	Fatigue	348.139	3	116.046	1.619	.184	.010
	Quality of life	1598.830	3	532.943	2.134	.095	.013
	Life satisfaction	281.198	3	93.733	2.488	.060	.016
Error	**Anxiety**	14501.580	470	30.854			
	Insomnia	19297.059	470	41.058			
	Stress	16344.190	470	34.775			
	Depression	179342.597	470	381.580			
	Fatigue	33678.685	470	71.657			
	Quality of life	117367.089	470	249.717			
	Life satisfaction	17703.480	470	37.667			
Corrected Total	**Anxiety**	19828.981	485				
	Insomnia	27494.461	485				
	Stress	25841.500	485				
	Depression	293800.593	485				
	Fatigue	44610.593	485				
	Quality of life	156012.881	485				
	Life satisfaction	23818.726	485				

The result of the hypothesis shows that there was a significant interaction between gender, ethnicity and type of diabetes on depression (F (3,470) =5.647, $p<0.001$; partial $\eta^2 = 0.035$), while there was no significant interaction effect between gender, ethnicity and type of diabetes on anxiety, insomnia, stress, fatigue, quality of life and life satisfaction.

The result also revealed that there was significant interaction between ethnicity and type of diabetes on anxiety (F (3,470) =6.024, $p<0.000$; partial $\eta^2 = 0.037$), while there was no significant interaction effect between ethnicity and type of diabetes insomnia, stress, depression, fatigue, quality of life and life satisfaction.

More so, the result also revealed that there was significant interaction between gender and type of diabetes on insomnia (F (1,470) =8.623, $p<0.003$; partial $\eta^2 = 0.018$), while there was no significant interaction effect between gender and type of diabetes on anxiety, stress, depression, fatigue, quality of life and life satisfaction. Similarly, the result also revealed that there was no significant interaction between gender and ethnicity in all the psychological health indicators.

There was significant effect of type of diabetes on anxiety (F (3,470) = 61.686, $p<0.000$; partial $\eta^2 = 0.116$), insomnia (3,470) = 58.362, $p<0.000$; partial $\eta^2 = 0.110$), stress (1,470) = 43.037, $p<0.000$; partial $\eta^2 = 0.084$), depression (1,470) = 49.411, $p<0.000$; partial $\eta^2 = 0.095$), fatigue (1,470) = 20.269, $p<0.000$; partial $\eta^2 = 0.041$), quality of life, (1,470) = 25.432, $p<0.000$; partial $\eta^2 = 0.051$), and life satisfaction (1,470) = 48.011, $p<0.000$; partial $\eta^2 = 0.093$).

There was significant effect of ethnicity on anxiety (F (3,470) = 7.247, $p<0.000$; partial $\eta^2 = 0.044$), insomnia (3,470) = 9.217, $p<0.000$; partial $\eta^2 = 0.056$), stress (1,470) = 11.507, $p<0.000$; partial $\eta^2 = 0.068$), depression (1,470) = 9.295, $p<0.000$; partial $\eta^2 = 0.056$), fatigue (1,470) = 6.995, $p<0.000$; partial $\eta^2 = 0.043$), quality of life, (1,470) = 9.395, $p<0.000$; partial $\eta^2 = 0.057$), and life satisfaction (1,470) = 4.971, $p<0.000$; partial $\eta^2 = 0.031$).

Furthermore, there was main effect of gender oninsomnia (1,470) = 25.579, $p<0.000$; partial $\eta^2 = 0.052$), stress (1,470) = 63.792, $p<0.000$; partial $\eta^2 = 0.120$), depression (1,470) = 63.570, $p<0.000$; partial $\eta^2 = 0.119$), fatigue (1,470) = 38.477, $p<0.000$; partial $\eta^2 = 0.076$), quality of life, (1,470) = 16.29, $p<0.000$; partial $\eta^2 = 0.033$), and life satisfaction (1,470) = 12.41, $p<0.000$; partial $\eta^2 = 0.026$), while there no main effect of gender on anxiety.

6.4.1 The Summary of the Main Findings for Question two

The finding showed that gender, ethnicity and type of diabetes had a significant interaction effect on depression. While ethnicity and type of diabetes showed a significant interaction effect on anxiety. More so, the finding showed a significant interaction between gender and type of diabetes on, insomnia. Similarly, ethnicity and type of diabetes each had a significant main effect on anxiety, insomnia, stress, depression, fatigue, quality of life, and life satisfaction, while gender had a significant main effect on insomnia, stress, depression, fatigue, quality of life, and life satisfaction.

6.5 Research Question Three: (Socio-cognitive health)

To what extent may differences insocio-cognitive factors (e.g., self-efficacy) among diabetic patients in Nigeria be explained by gender, ethnicity, and type of diabetes?

A multivariate analysis of variance (MANOVA) was used to address the research question above. MANOVA is considered appropriate as it is a test that includes several dependent variables in a single analysis and the general factors of socio-cognitive health in this study was assessed using a number of measures. Secondly, it can protect against Type I errors that might occur if multiple ANOVA's were conducted independently.

In other words the analysiscombines all the dependent variables (DVs) into one single variable (Socio-cognitive health) and looks to see if there are any differences between the independent variables (IVs) gender, ethnicity, and type of diabetes on the combined dependent variables. The rationale for combining the DVs is that they are all linked and are all aspects that may be affected by the disease. From the result of the MANOVA below it looks as though almost all the interactions and main effects are significant. More so, the interpretation of the result will begin with the significant interaction first then followed with the main effects.

Considering the MANOVA assumptions: 1.) The *Multicollinearity (correlations between variables should not be too high)*. Only one correlation is greater than 0.9. (See Appendix: K). 2.)*There was no homogeneity of variance-covariance matrices* from the Levene's and all the DV's were significant; 3.)*The data was not normally distributed*. Almost all values of Skewnessn and Kurtosis divided by the appropriate SE, for all DVs, were greater than 1.96.Given the violation of some of the parametric assumptions, Pillai's Trace was used as the test statistic as it is the most robust to such violations (Field, 2009). However, the results were interpreted with caution. More so, a two-stage approach was employed in the data analysis and interpretation. That is, a broad (MANOVA) with a combined DVs then followed by (ANOVAs) that look at specific aspects of the datain more detail.

Table 6.6 Shows a 2x4x2 MANOVA of the main and interaction effect of gender, ethnicity and types of diabetes on the combined DV (socio-cognitive health).

Effect	Value	F	Hypothesis Df	Error df	sig	Partial Eta Squared
Gender	.133	7.844	9.000	462.000	.000	.133
Ethnicity	.194	3.557	27.000	1392.000	.000	.065
Type of diabetes	.201	12.896	9.000	462.000	.000	.201
Gender * Ethnicity	.127	2.286	27.000	1392.000	.000	.042
Gender * Type Diabetes	.048	2.599	9.000	462.000	.006	.048
Ethnicity * Type Diabetes	.098	1.748	27.000	1392.000	.010	.033
Gender * Ethnicity * Type Diabetes	.135	2.426	27.000	1392.000	.000	.045

a. Design: Intercept + Gender + Ethnicity + Type of diabetes + Gender * Ethnicity + Gender * Type of diabetes + Ethnicity * Type of diabetes + Gender * Ethnicity * Type of diabetes

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

There was a significant three-way interaction between gender, ethnicity and the type of diabetes (F(27,1392) = 2.426, *p* = 0.000; Pillai's Trace = 0.135; partial η^2 = 0.045). The result further revealed that there was a significant two-way interaction between Ethnicity and type of diabetes (F(27,1392) = 1.748, *p* = 0.010; Pillai's Trace = 0.098; partial η^2 = 0.033). More so, gender and type of diabetes have significant two-way interaction between each other (F (9,462) = 2.599, *p* = 0.006; Pillai's Trace = 0.048; partial η^2 = 0.048). Furthermore, there was significant two-way interaction between gender and ethnicity (F(27,1392) = 2.286, *p* = 0.000; Pillai's Trace = 0.127; partial η^2 = 0.042). The result from the table also revealed that there was a significant main effect of the Type of diabetes (F(9,462) = 12.896, *p*< 0.000; Pillai's Trace = 0.201; partial η^2 = 0.201). In addition there was significant main effect of ethnicity (F(27,1392) = 3.557, *p*< 0.000; Pillai's Trace = 0.194; partial η^2 = 0.065). Finally, it further showed that there was significant main effect of gender (F(9,462) = 7.844, *p*< 0.000; Pillai's Trace = 0.133; partial η^2 = 0.133).In sum from the output of the MANOVA in table 6.6 the Partial Eta Squared value was compared to look out for the Partial η^2 that explained more of the variance by an IV from the combined DVs. In terms of socio-cognitive heath, type of diabetes explains more of the variance remaining (after excluding the variance attributable to other variables) 20.1% than gender 13.3% which, in turn, explains more of the variance than ethnicity 6.5%.

In table 6.7below is a summary of the 2x4x2 multiple analysis of variance (ANOVA) showing the main and interaction effect of gender, ethnicity and type of diabetes on each DVs. Bascially table 6.7below shows a detail and specific analysis of the MANOVA, but with each DV (Self esteem, optimism, etc) separated out. In other words instead of one combined DVs result, is then nine (one for each DV). However, the breakdown of the analysis identified the specific DV that has ineteraction and main effect with the IVs gender, ethnicity and type of diabetes. A Bonferroni correction was applied to give an alpha value of $p < 0.005$.

Table 6.7 Summary of multiple analyses of variance (ANOVA) showing the breakdown of main and interaction effect of gender, ethnicity and types of diabetes on each of the DV's (socio-cognitive health).

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Gender	Self-esteem	1397.179	1	1397.179	26.829	.000	.054
	Optimism/pessimism	399.590	1	399.590	7.698	.006	.016
	Social support	2633.751	1	2633.751	10.478	.001	.022
	Coping	767.200	1	767.200	26.547	.000	.053
	Self-efficacy	889.977	1	889.977	14.081	.000	.029
	Locus of control	1008.185	1	1008.185	9.687	.002	.020
	Sense of coherence	12074.857	1	12074.857	29.994	.000	.060
	Religiosity	987.345	1	987.345	43.851	.000	.085
	Negative religious coping	963.683	1	963.683	8.863	.003	.019
Ethnicity	Self-esteem	1790.435	3	596.812	11.460	.000	.068
	Optimism/pessimism	450.568	3	150.189	2.893	.035	.018
	Social support	4879.604	3	1626.535	6.471	.000	.040
	Coping	415.109	3	138.370	4.788	.003	.030
	Self-efficacy	967.445	3	322.482	5.102	.002	.032
	Locus of control	167.753	3	55.918	.537	.657	.003
	Sense of coherence	1541.204	3	513.735	1.276	.282	.008
	Religiosity	692.722	3	230.907	10.255	.000	.061
	Negative religious coping	161.418	3	53.806	.495	.686	.003
Type of diabetes	Self-esteem	2508.798	1	2508.798	48.174	.000	.093
	Optimism/pessimism	897.385	1	897.385	17.288	.000	.035
	Social support	6551.279	1	6551.279	26.063	.000	.053
	Coping	1270.586	1	1270.586	43.966	.000	.086
	Self-efficacy	3556.571	1	3556.571	56.270	.000	.107
	Locus of control	4247.124	1	4247.124	40.806	.000	.080
	Sense of coherence	22032.708	1	22032.708	54.729	.000	.104
	Religiosity	1432.560	1	1432.560	63.625	.000	.119
	Negative religious coping	1492.804	1	1492.804	13.729	.000	.028
Gender * Ethnicity	Self-esteem	502.616	3	167.539	3.217	.023	.020
	Optimism/pessimism	47.395	3	15.798	.304	.822	.002
	Social support	1754.102	3	584.701	2.326	.074	.015
	Coping	237.204	3	79.068	2.736	.043	.017
	Self-efficacy	356.617	3	118.872	1.881	.132	.012
	Locus of control	628.019	3	209.340	2.011	.112	.013
	Sense of coherence	697.287	3	232.429	.577	.630	.004
	Religiosity	60.280	3	20.093	.892	.445	.006
	Negative religious coping	75.443	3	25.148	.231	.875	.001
Gender * Type of diabetes	Self-esteem	354.249	1	354.249	6.802	.009	.014
	Optimism/pessimism	174.895	1	174.895	3.369	.067	.007
	Social support	621.153	1	621.153	2.471	.117	.005
	Coping	72.678	1	72.678	2.515	.113	.005
	Self-efficacy	457.770	1	457.770	7.243	.007	.015
	Locus of control	559.233	1	559.233	5.373	.021	.011
	Sense of coherence	2914.745	1	2914.745	7.240	.007	.015
	Religiosity	176.200	1	176.200	7.826	.005	.016
	Negative religious coping	854.912	1	854.912	7.863	.005	.016
Ethnicity * Type of diabetes	Self-esteem	453.964	3	151.321	2.906	.034	.018
	Optimism/pessimism	635.467	3	211.822	4.081	.007	.025
	Social support	1653.883	3	551.294	2.193	.088	.014
	Coping	436.317	3	145.439	5.033	.002	.031
	Self-efficacy	352.698	3	117.566	1.860	.135	.012
	Locus of control	914.846	3	304.949	2.930	.033	.018
	Sense of coherence	3448.473	3	1149.491	2.855	.037	.018
	Religiosity	162.864	3	54.288	2.411	.066	.015
	Negative religious coping	128.783	3	42.928	.395	.757	.003

Gender * Ethnicity * Type of diabetes	Self-esteem	445.377	3	148.459	2.851	.037	.018
	Optimism/pessimism	1.988	3	.663	.013	.998	.000
	Social support	2984.846	3	994.949	3.958	.008	.025
	Coping	117.828	3	39.276	1.359	.255	.009
	Self-efficacy	883.611	3	294.537	4.660	.003	.029
	Locus of control	1591.533	3	530.511	5.097	.002	.032
	Sense of coherence	2579.998	3	859.999	2.136	.095	.013
	Religiosity	330.674	3	110.225	4.895	.002	.030
	Negative religious coping	226.677	3	75.559	.695	.555	.004
Error	Self-esteem	24476.348	470	52.077			
	Optimism/pessimism	24396.703	470	51.908			
	Social support	118139.330	470	251.360			
	Coping	13582.722	470	28.899			
	Self-efficacy	29706.564	470	63.205			
	Locus of control	48917.715	470	104.080			
	Sense of coherence	189210.525	470	402.576			
	Religiosity	10582.408	470	22.516			
	Negative religious coping	51103.271	470	108.730			
Corrected Total	Self-esteem	37969.037	485				
	Optimism/pessimism	27972.955	485				
	Social support	155349.665	485				
	Coping	19691.047	485				
	Self-efficacy	42163.646	485				
	Locus of control	62746.955	485				
	Sense of coherence	259177.615	485				
	Religiosity	17495.745	485				
	Negative religious coping	59839.566	485				

The result of the hypothesis shows there was a significant interaction between gender, ethnicity and type of diabetes on, self-efficacy (3,470) = 4.660, p<0.003; partial η^2 = 0.029), locus of control, (3,470) = 5.097, p<0.002; partial η^2 = 0.032), and religiosity (3,470) = 4.896, p<0.002; partial η^2 = 0.030), while there was no significant interaction between gender, ethnicity and type of diabetes on self-esteem, optimism,social support, coping, sense of coherence and negative religious coping .

Furthermore, there was significant interaction between ethnicity and type of diabetes on coping (1,470) = 5.033, p<0.002; partial η^2 = 0.031), while there was no significant interaction between ethnicity and type of diabetes on self-esteem, optimism, social support, self-efficacy, locus of control, sense of coherence,religiosity and negative religious coping.

The result also revealed that there was significant interaction between gender and type of diabetes on religiosity (1,470) = 7.826, p<0.005; partial η^2 = 0.016) and negative religious coping (1,470) = 7.863, p<0.005; partial η^2 = 0.016), while there was no significant interaction between gender and type of diabetes on self-esteem, optimism, social support, coping, self-efficacy, locus of control and sense of coherence.

More so, the result also revealed that there was no significant interaction between gender and ethnicity in all the socio-cognitive health indicators.

In addition, there was main effect of type of diabetes on self-esteem (F (1,470) = 48.174, $p<0.000$; partial $\eta^2 = 0.093$), optimism (1,470) = 17.288, $p<0.000$; partial $\eta^2 = 0.035$), social support (1,470) = 26.063, $p<0.000$; partial $\eta^2 = 0.053$), coping (1,470) = 43.966, $p<0.000$; partial $\eta^2 = 0.086$), self-efficacy (1,470) = 56.270, $p<0.000$; partial $\eta^2 = 0.107$), locus of control, (1,470) = 40.806, $p<0.000$; partial $\eta^2 = 0.080$), sense of coherence (1,470) = 54.729, $p<0.000$; partial $\eta^2 = 0.104$), religiosity (1,470) = 63.625, $p<0.000$; partial $\eta^2 = 0.119$) and negative religious coping (1,470) = 13.729, $p<0.000$; partial $\eta^2 = 0.028$).

Apparently, the result further reveal that there was significant effect of ethnicity on self-esteem (F (1,470) = 11.460, $p<0.000$; partial $\eta^2 = 0.068$), social support (1,470) = 6.471, $p<0.000$; partial $\eta^2 = 0.040$), coping (1,470) = 4.788, $p<0.003$; partial $\eta^2 = 0.030$), self-efficacy (1,470) = 5.102, $p<0.002$; partial $\eta^2 = 0.032$), religiosity (1,470) = 10.255, $p<0.000$; partial $\eta^2 = 0.061$), while there was no significant main effect of ethnicity on optimism, locus of control, sense of coherence and negative religious coping.

Finally, there was main effect of gender on self-esteem (F (1,470) = 26.829, $p<0.000$; partial $\eta^2 = 0.054$), social support (1,470) = 10.478, $p<0.001$; partial $\eta^2 = 0.022$), coping (1,470) = 26.547, $p<0.000$; partial $\eta^2 = 0.053$), self-efficacy (1,470) = 14.081, $p<0.000$; partial $\eta^2 = 0.029$), locus of control, (1,470) = 9.687, $p<0.002$; partial $\eta^2 = 0.020$), sense of coherence (1,470) = 29.994, $p<0.000$; partial $\eta^2 = 0.060$), religiosity (1,470) = 43.851, $p<0.000$; partial $\eta^2 = 0.085$) and negative religious coping (1,470) = 8.863, $p<0.003$; partial $\eta^2 = 0.019$), while there was no significant main effect of gender on optimism.

6.5.1 The summary of the Main Findings for Question Three

The finding shows that there was significant interaction between gender, ethnicity and type of diabetes onself-efficacy, locus of control and religiosity, while ethnicity and type of diabetes had significant interaction effect on coping. Similarly, the finding showed that gender and type of diabetes significantly had interaction on religiosity and negative religiosity, while gender and ethnicity had non-significant interaction effect on all the socio-cognitive health indicators. Furthermore, gender significantly had main effect in each of socio-cognitive health indicators except for optimism, and ethnicity significantly had main effect on self-esteem, social support, coping, self-efficacy and religiosity. Type of diabetes significantly had main effect in each of socio-cognitive health indicators.

6.6 Overall Findings:

The over all finding showed that in terms of psychological health indicators that gender, ethnicity and type of diabetes has a significant interaction effect on depression. Ethnicity and type of diabetes has a significant interaction effect on anxiety. More so, the finding showed a significant interaction between gender and type of diabetes on insomnia. While ethnicity and type of diabetes has a significant effect on anxiety, insomnia, stress, depression, fatigue, quality of life, and life satisfaction and gender had a significant main effect in all the psychological health indicators except on anxiety.

Similarly, in terms of socio-cognitive health indicators the finding shows that gender, ethnicity and type of diabetes has a significant interaction on self-efficacy, locus of control and religiosity, while ethnicity and type of diabetes had significant interaction on coping. Also, gender and type of diabetes has a significant interaction on religiosity and negative religiosity.

Furthermore, gender significantly had a main effect in each of socio-cognitive health indicators except on optimism. While, ethnicity had a significant main effect on self-esteem, social support, coping, self-efficacy, and religiosity. And type of diabetes significantly had a main effect in each of the socio cognitive health indicators.

In terms of the pattern of socio-demographic factors associated with psychological health indicators the QUAN data showed that: Being a type 2 diabetes patients, with medium income, married, age bracket between 35-51 year old, civil servant, having a university degree, with duration of diabetes for 6 months and above, having 1-4 children was significantly associated with lower depression, stress, fatigue, mild anxiety, absence of insomnia and higher quality of life and life satisfaction. Patients who are member of protestant religious faith and who lived in town significantly reported mild anxiety, absence of insomnia, higher stress, and lower level of depression, fatigue, lower quality of life and were dissatisfied with life. Patients who are Igbo significantly reported lower depression stress and mild anxiety while patients who are Yoruba ethnic group significantly reported lower fatigue, absence of insomnia and were dissatisfied with life whereas patients who are of ‘Others’ ethnic groups significantly reported lower quality of life. Female gender significantly reported higher stress and depression, mild anxiety sub-threshold of insomnia, lower score in fatigue, quality of life and life satisfaction whereas their male counterparts significantly reported lower stress and depression, higher score in fatigue, quality of life and life satisfaction. Furthermore, in terms of the pattern of socio-cognitive factors associated with psychological health the findings showed that diabetes patients with manageability sense of coherence, external locus of control, emotional focus-coping, and higher score in self-esteem, self-efficacy, optimism, religiosity, social support, and with lower score on negative religiosity significantly reported lower stress, depression, fatigue, mild anxiety, absence of insomnia and higher score in quality of life and life satisfaction compare to diabetes patient with comprehensibility sense of coherence, internal locus of control problem focus-coping, and lower score in self-esteem, self-efficacy, optimism, religiosity, social support, and with high score on negative religiosity.

6.7 Chapter Summary

The results described in this chapter were obtained from the three stated hypotheses. The findings showed that high score of psychopathology i.e. (poor psychological health) was associated with lower scores in each of the socio-cognitive health indicators except for negative religious coping which higher score implies poor response of religious coping. Similarly, higher quality of life and life satisfaction were associated with patients who had higher mean score on each of the socio-cognitive health indicators. Also, type of diabetes contributed more of the variance after excluding the variance attributable to other variables, than gender, which in turn explains more of the variance than ethnicity. The discussion of the findings is presented in the next chapter, while the overall findings that contribute to knowledge are presented in chapter 11.

CHAPTER SEVEN

DISCUSSION OF THE QUANTITATIVE RESULTS

7.0 Introduction

This study examined the psychological health of patients with diabetes and their relationship with socio-cognitive and socio-demographic factors. This chapter also provided a summary of the findings from the three (3) non-directional hypotheses which are as follows: 1) that there will be a significant difference in the pattern of psychological health of diabetic patients' socio-demographic variables and socio-cognitive factors, 2) There will be a significant difference in the psychological status of diabetic patients by gender, ethnicity and type of diabetes.

3) There will be a significant difference in the socio-cognitive factors of diabetic patients by gender, ethnicity and type of diabetes. In addition, this chapter presents key findings from the quantitative study and places them in a larger context using extant literature.

7.1 Hypothesis one:

A cross-tabulation was utilized for the analyses of hypothesis one and the finding are as follows:

- Diabetes patients with manageability sense of coherence, external locus of control, emotional focus-coping, and higher in self-esteem, self-efficacy, optimism, religiosity, social support, and lower negative religiosity reported low stress, depression, mild anxiety, absence of insomnia and fatigue, had higher quality of life and life satisfaction.
- Being a type 2 diabetes, with a medium income, married, age bracket between 35-51 year old, civil servant, having a university degree, with duration of diabetes for 6 months and above, having 1-4 children, associated with lower depression, stress, fatigue, mild anxiety, absence of insomnia and higher quality of life and life satisfaction.
- Patients who belong to protestant religious faith and who lived in town reported mild anxiety, absence of insomnia, higher stress, and low level of depression, fatigue, lower quality of life and were dissatisfied with life.
- In terms of ethnic groups, patients who are Igbo reported low depression stress and mild anxiety while patients who are Yoruba ethnic group significantly reported lower fatigue,

absence of insomnia and were dissatisfied with life whereas patients who are of 'Others' ethnic groups reported low quality of life.

- On genders females diabetic patients reported higher stress and depression, mild anxiety sub-threshold of insomnia, lower fatigue, and quality of life and lower life satisfaction whereas their male counterparts reported lower stress and depression, higher in fatigue, quality of life and life satisfaction.

Various theoretical perspectives have argued and empirical research has shown that demographic characteristics are important factors to understanding the Psychological health of diabetic population (El-Shafie, El- Saghier and Ramadam (2011). Also from a sociological perspective, these factors, especially ethnicity, class (income and education), and gender are important in that they help provide a social context for the phenomenon being studied, in this case the backdrop in which diabetes is lived regarding patients psychological response. Previous empirical research has found that demographic factors influence the psychological status of diabetic patients in different ways. This was fully supported in this study.

In terms of specific findings between socio-cognitive health indicators and psychological status, findings from this study were overwhelmingly similar to previous empirical studies, that is, diabetes patients who had high self-esteem reported mild anxiety, absence of insomnia, low stress, low depression, low fatigue, were satisfied with life and had high quality of life compare to respondents of low self-esteem. Interestingly, the studies of Murawski et al., (1970) supported this present study as the authors reported that diabetic patients with low self-esteem significantly reported high depression than patients with high self-esteem. More so, Sabri, et al., (2014) reported that patients with higher self-esteem had better quality of life than the patient with low self-esteem.

This study found that patients who are characterized with manageability of sense of coherence reported mild anxiety absence of insomnia, low perceived stress, low depression, low fatigue, satisfied with life and high quality of life compare to respondents with comprehensibility. Due to lack of other study that analysed SOC within each construct to verify this result is not possible, this finding should be considered tentatively.

With regard to health locus of control the study shows, that diabetes patients with external locus of control reported mild anxiety, absence of insomnia, low stress, low depression, lower fatigue, were satisfied with life and had higher quality of life compare to respondents with internal locus of control. Surprisingly, other studies found locus of control in opposite direction for instance Lehman, (2012) reported that patients with an internal locus of control tend to be more positive, and less depressed and anxious than those with an external locus of control. A similar finding was also reported by Aalto, Uutela and Aro (2000); and Jacobson et al., (1986) that patient with internal locus of control significantly reported low perceived stress than patients with external locus of control, and thatinternally locus of control patients had an easier time management oftheir diabetes, and tend to have better health outcomes, than those with externally locus of control who do not have better health outcomes. However, the present study finding is in contrast with those of Lehman, 2012; Aalto, Uutela and Aro 2000; and Jacobson et al., 1986).

The present study finding is of particular importance in Nigeria diabetic care to consider the influence of external locus of control which seems to be an indication of patient’s willingness to follow Doctor’s advice and recommendation. However in explaining this unusual outcome of patients who endorses externality to have had lower psychopathology than patients with internal health locus of control could be attributed to the various factors such as the communal culture that exist in Nigeria where by individuals don’t really exercise or make decision without the consent and agreement of the entire family members. More so the adherence of religiousness which dominates in every Nigerian could be a possible factor in that patients having faith that God will sort their situation out for them in the end could enhance their psychological health. Although, this assumption would have being substantiated if the variables were subjected into inter-correlation analysis but since this was not part of the study objectives it became impossible to establish. However, this has an implication for further research to assess the inter-correlation between these constructs for clarity purpose.

In terms of coping strategies prior studies found that patients with emotional focused coping reported higher stress, anxiety, depression, and were dissatisfied with life than patients with problem focused coping (Riazi, Pickup and Bradley 2004; Samuel-Hodge et al., 2008; Macrodimitris and Eldler 2001; Karlsen et al., 2004 Pretorius, Walker and Esterhuyse 2010; Tuncay et al., 2008 Ridder and Bensing 2002). While on the other hand Duangdao and Roesch (2008) found that diabetic patients who have both problem focused coping and emotional focused coping significantly reported low depression than patients who have less of those coping strategies. These findings above on coping strategies is in conflict with the evidence from the present study given that patients with emotional focus coping reported mild anxiety absence of insomnia, low stress, low depression, low fatigue, satisfied with life and had higher quality of life compare to respondents with problem focus coping.

In relation to patients Self-efficacy the current study found that diabetes patients with high self-efficacy reported mild anxiety, absence of insomnia, low stress, low depression, low fatigue, had higher quality of life and higher life satisfaction compare to respondents with low self-efficacy. Equally, the study of Rose et al., (2004) reported that patients with higher self-efficacy had high quality of life than patient with low self-efficacy. More so, Talbot et al., (1999) reported that patient with low self-efficacy had higher depression than patients with high self-efficacy.

On the other hand the current study found that patients with low optimism which is a disposition that is marked by non-enduring tendency in expecting unfavorable outcomes to be associated with mild anxiety, moderate insomnia, high perceived stress, high depression, and high fatigue, dissatisfaction with life and low quality of life compare to respondents with high optimism. The finding of the current study on optimism can compare favorably with the study ofRose et al., (2004) who found that patients with higher optimism significantly reported high quality of life than patient with lower score of optimism. While the study of Fournier, Ridder and Bensing (2002)is partially supported with the present study in terms of depression but not on anxiety since the authors found that patient with high optimism reported low depression and anxiety than patients with low optimism. However, the current study finding is in support with that of Rose et al., (2004) in terms of patients’ high optimism associated with their higher quality of life. On the social support this study found that diabetes patients with high social reported mild anxiety, absence of insomnia, low perceived stress, low depression, low fatigue, were satisfied with life and had higher quality of life compare to respondents with low social support. Similarly, studies in other nations (Kaholokula et al., 2003; Osborn and Egede 2012) have reported a higher level of depression in patient with lower social support than those with higher social support. More so, Carrillo et al., (2009); and Huang et al., (2010) found higher quality of life in patients with higher social support than patient with lower social support. Therefore, the current study finding is in support with that of Kaholokula et al., (2003); Osborn and Egede (2012); Carrillo et al., (2009); and Huang et al., (2010) in terms of higher social support associated with patients' lower level of depression and higher quality of life.

In terms of patient's perception of negative religious coping, the current study found that patients with high negative religious coping reported mild anxiety, absence of insomnia compare to respondents with low negative religious coping. While on the other hand patients with low negative religious coping significantly reported low perceived stress, low depression, low fatigue, and were satisfied in life and had higher quality of life than respondents with high negative religious coping. However, due to the lack of other studies to verify this result, this finding should be considered tentatively. Although, in a study conducted among cancer patients by Hebert et al., (2009) reported that patients with high negative religious coping have higher level of distress.

Interestingly, the present study showed that high negative religious coping was associated with poor psychological health except for anxiety and insomnia. Consequently, patients who continue to struggle with religious issues over time may be particularly at risk for health-related problems. The finding from this study therefore underscores the importance of addressing the religious issue and spiritual struggle expressed by diabetes patients in relation to self-care management of their condition.

In regards to religiosity this current study found that patients with high religiosity/spirituality reported mild anxiety, absence of insomnia, low perceived stress, low depression, and low fatigue, were satisfied with life and had higher quality of life compare to respondents with low religiosity/spirituality. The current study equally compares more favourably to the findings of Kilbourne and Cummings (2009); and

Kelly, Hertzan and Daniel (1997) who found that patient who endorsed higher religious beliefs significantly reported low depression, low anxiety and stress than patients who endorsed low religious belief. While in contrast the study of Wahyu et al., (2013) found that patients with higher religiosity reported high stress than those with lower religiosity. However, the current is in support with the findings of Kilbourne and Cummings (2009); and Kelly, Hertzan and Daniel (1997).

In this study patients belonging to age range of 35-51 years old reported mild anxiety, absence of insomnia, lower perceived stress, depression, fatigue, and were satisfied with life and had higher quality of life compare to respondents within age bracket of 18-34 years old and 52 years and above. However, a large sizable number of studies are in congruence with this finding. E.g., a study conducted by Zhao et al., (2006) showed that patients aged 20-39 year old reported a slightly higher depression than patients aged 40-65 year old. Conversely, others studies found depression to be higher in patients aged 54 and above Raval et al., (2010), young adult were higher in stress and depression than patient who are older adults Hessler et al., (2011), more so, Aalto, Uutela and Aro (1997); Papadopoulos et a., (2007) found that older adult with diabetes significantly reported low health related quality of life than patient who are middle and younger age. A possible explanation in terms of the higher rate of psychopathology among young and older patients as identified in this study and across other studies could be attributed to the expectancy stage of life cycle for the younger patient while that of the older patient could be attributed to the fourth emotional response of chronic illness advanced by Elisabeth Kubler-Ross that older patients may become depressed because they may grieve what they have already lost (for example the ability to walk or have independence) and grieve the impending separation from loved ones. Although, Poulsen and Pachana (2012) found that middle aged adults were affected with higher rate of depression and anxiety than the older adult with diabetes which is in conflict with the present study. Nevertheless, the study of Aalto, Uutela and Aro (1997); Papadopoulos et al., (2007); Raval et al., (2010); Zhao et al., (2006) supported the current study findings and this implied that adequate care should be given particularly to diabetic patients within age range of 18-34 (younger adults) and 52 and above (older adults).

In regard to the pattern of psychological health by gender, patients who are female reported mild anxiety and low fatigue than male, while on the other hand female patients reported sub-threshold of insomnia, high perceived stress, high depression, and were dissatisfied with life and had lower quality of life compare to respondents who are male. Other studies across the world also provide evidence that being female is associated with higher prevalence of depression (Galveia, Cruz and Deep, 2009). Similarly, Wisconsin and Indiana (2002) found female gender to have more severe insomnia than male patients. Hussein, Khther and Hadithi (2010); Unden et al., (2008) found low quality of life among female diabetic patients than their male counterpart. More so, Tuncay et al., (2008) reported that male diabetic patient had higher level of anxiety than the female. While in contrast Grigsby et al., (2002); Koulouri et al., (2009); Bener, Al- Hamaq and Dafeeah (2011); Skinner, John and Hampson (2000) reported that female gender had higher rate of anxiety than the males. Similarly, Naughton et al., (2008) found that female patients significantly reported higher quality of life than male patients. However, the present study finding is in full supported with the finding of Galveia, Cruz and Deep, (2009); Wisconsin and Indiana (2002) Hussein, Khther and Hadithi (2010); Unden et al., (2008) and Tuncay et al., (2008).

On the types of diabetes the current study shows that patients with type 2 diabetes reported higher anxiety, absence of insomnia, lower perceived stress, lower depression, lower fatigue, was more satisfied with life and had higher quality of life compared to respondents with type 1 diabetes. Similarly, from the reviewed literature the study of Lasselin et al., (2012) supported the current study finding in terms of patients with type 2 diabetes reported higher fatigue than type 1 patient. While in contrast the study of Naughton et al., (2008) found higher quality of life among patients with type 1 than type 2.

With regard to duration of diabetes the finding of Paschalides et al., (2004) shows that diabetic patients who have longer duration of illness significantly reported higher level of anxiety than patients with short duration of diabetes. On the contrary, the current study found that patients with 6 months and above duration of diabetes reported mild anxiety, absence of insomnia, low perceived stress, low depression, low fatigue, was satisfied with life and had higher quality of life compare to respondents within 0-5 months of duration of diabetes. However, further studies are encouraged to examine the disparities concerning the duration of diabetes as it is more likely that patients with longer duration are more vulnerable in developing poor psychological health than those with shorter duration of diabetes.

In terms of marital status, which is often viewed as a social and financial resource, prior literature suggests that patient who are widowed, separated/divorced and not married generally reported higher depression and low quality of life than patient who are married (Gurpreet et al., 2013; Francisco, Zenteno and Cardiel 2001; Kaholokula et al., 2003; Wisconsin and Indiana 2002; Papadopoulos et al., 2007). Similarly the above finding supported the current study given that patients who are married reported mild anxiety, absence of insomnia, low perceived stress, low depression, low fatigue, was satisfied with life and had higher quality of life compare to respondents who are single, separated and divorced.

In terms of educational status this current study found that diabetes patients who acquired university degree reported mild anxiety, absence of insomnia, low depression and low fatigue, and were satisfied with life and had higher quality of life than respondents with primary and secondary education. While on the other hand patients who acquired secondary school education reported high perceived stress than respondents with primary and university education. Similarly, studies conducted by Collins, Corcorant and Perry (2009); Kaholokula et al., (2003) found that patients with low educational attainments significantly reported higher depression that patients with higher educational degree. More so, Peyrot and Robin (1997) found that patient with low education had higher rate of anxiety than patient with high education. While on the contrary Tuncay et al., (2008) reported that diabetic patients with higher degree of education had more anxiety than patients who have less education. However, the present study is in supported with findings of Collins, Corcorant and Perry (2008); Kaholokula et al., (2003) and Peyrot and Robin (1997).

The finding from this study also shows that diabetes patients who lived in the town reported milder anxiety, absence of insomnia, higher perceived stress, lower fatigue, depression, were dissatisfied with life and had lower quality of life compare to respondents who lived in village. Similarly the present study is in support with the finding of Papathanasiou et al., (2008) who reported that patients who live in town (urban) significantly reported lower level of quality of life than patients who live in village (rural).

In relation to the number of children this study found that patients who had between 1-4 children reported milder anxiety, absence of insomnia, lower perceived stress, lower depression, lower fatigue, were satisfied with life and have higher quality of life than respondents who had no children and 5 children and above. The current study supported a similar finding reported in Nigeria among diabetes patient by James et al., (2010) that patients with more children significantly reported higher depression than patient with fewer children.

In terms of the religion for which patients belongs, the current study found that patients who are protestant reported milder anxiety, absence of insomnia, higher perceived stress, lower depression, and lower fatigue, were dissatisfied with life and had lower health quality of life compared to respondents from other religious group. Surprisingly there is lack of studies to support this finding within the Nigeria context of diabetes population. However, this finding suggests that the psychological health of diabetic patients may vary in terms of different engagement of religious orientation.

With regard to occupation and monthly income of the diabetes patient, this present study reveals that diabetes patients who are civil servants and medium income earners reported mild anxiety, absence of insomnia, low perceived stress, low depression, low fatigue, were satisfied with life and had higher health quality of life compared with respondents who are unemployed, self-employed, student and those who earned low and high income. This finding of the present supported the study of Wisconsin and Indiana (2002) who reported that diabetic patients who are unemployed significantly reported higher depression than patients who are employed. Conversely, Plantinga, Rao and Schillinger (2012) found that patients who earned higher income significantly reported low prevalence of insomnia than patients who earned lower income. More so, Imayama et al., (2011) found that patients who earned higher income significantly reported higher quality of life and life satisfaction than patients who earned low income. While, the finding of Tuncay et al., (2008) shows that higher income earner had higher anxiety than patients who earned low income.

Furthermore, with regard to ethnicity this study found that diabetes patients who are Igbo reported mild anxiety, low perceived stress, low depression compare to respondents from Hausa, Yoruba and other ethnic groups. While Yoruba patients reported absence of insomnia low fatigue, than respondents from Igbo, Hausa and ‘others’ ethnic groups. More so patient who are Yoruba were dissatisfied with life than patient who are Hausa, Igbo and ‘others’ ethnic group. While patient who are from ‘others’ ethnic group reported low quality of life than patient from Hausa, Igbo and Yoruba ethnic group. However, it is not surprising, from this study as regard to the low quality of life found in patients who are of ‘others ethnic group’ for the reason been that this individuals forms the minorities ethnic grouping across the six geo-political regions in Nigeria and in practical terms they are mostly effected in terms of political and economic marginalization. Similarly, Quandt et al., (2007) found low quality of life in Native Americans who are minority group than their White counterpart. The current study finding has a particular implication for health care profession in Nigeria to give specifically attention for patients who are of ‘other minority ethnic grouping’ in improving their health related quality of life.

In summary, the hypothesis 1 results indicated that there are similar pattern of each of the psychological health indicators for patient endorsing manageability sense of coherence, external locus of control, emotional focus-coping, and higher in self-esteem, self-efficacy, optimism, religiosity, social support, and lower negative religiosity. Also, each of the psychological health indicators were similar for type 2 patients with medium income, married, age bracket between 35-51 year old, civil servant, having a university degree, with duration of diabetic for 6 months and above, and having 1-4 children.

Furthermore, in terms of religion patients who belong to protestant and who lived in town reported mild anxiety, absence of insomnia, higher stress, and low level of depression, fatigue, lower quality of life and were dissatisfied with life.

In term of ethnic group differences on psychological health indicators the result showed that patients of Igbo ethnic groups reported lower depression, stress, anxiety absence of insomnia and higher life satisfaction. The Yoruba's reported lower fatigue, absence of insomnia and were dissatisfied with life, while patients of 'Others' ethnic groups reported a lower score in each of the psychological health indicators. In terms of gender, the results revealed that female's reported higher stress and depression, mild anxiety sub-threshold of insomnia, lower fatigue and quality of life and were dissatisfied in life, whereas their male counterparts reported higher anxiety and fatigue.

7.2 Hypothesis Two:

This study did hypothesize that there will be a significant difference in the psychological status of diabetic patients by gender, ethnicity and type of diabetes. However, a multivariate analysis of variance MANOVA was conducted to explore the difference by gender, ethnicity and type of diabetes on the psychological health indicators. More so, previous empirical research has found that gender, ethnicity and type of diabetes as a factor influence various psychological status of diabetic patients in different ways. This was fully supported in this study, in that gender, ethnicity and type of diabetes showed a 2x4x2 interaction and each had a main effect on the combined DVs psychological health and in each of the specific psychological health indicators. The finding will be discussed based on the specific psychological health indicators which detailed the aspects of the interaction and main effect in the MANOVA analysis.

Specifically, the ANOVA findings showed that gender, ethnicity and type of diabetes had a significant interaction on depression. While for ethnicity and type of diabetes the finding showed a significant interaction effect on anxiety. More so, the finding revealed a significant interaction between gender and type of diabetes on insomnia. While, ethnicity and type of diabetes each had a significant and main effect on anxiety, insomnia, stress, depression, fatigue, quality of life, and life satisfaction. And gender had a significant and main effect on insomnia, stress, depression, fatigue, quality of life, and life satisfaction.

Surprisingly, only the study of Fisher et al., (2001) have tested the interaction effect between gender, ethnicity and type of diabetes on psychological health indicator and their finding showed no significant interaction effect between gender, ethnic group and type of diabetes on depression, that is no differences rates of likely depression between males and females both across and within ethnic groups among type 2 diabetic patients was found. However, the present study does not support the finding of Fisher et al., (2001) in terms of the interaction between gender, ethnicity and type of diabetes on depression.

Furthermore, regarding the interaction observed between ethnicity and type of diabetes on psychological indicators, in terms of quality of life the current study showed no significant interaction between ethnicity and type of diabetes. The finding of Quandt et al., (2007) is in conflict with the current study finding as the authors reported a significant interaction between ethnicity and type of diabetes on quality of life that is; Native America with type 2 diabetes had lower health related quality of life HRQOL than their Whites counterparts with type 1 diabetes.

Interestingly, a large proportion of studies across world supported the finding of the present study, in terms of the significant interaction between gender and type of diabetes on insomnia, for instance the study of Olsson et al., (2012) found a significant interaction between gender and type of diabetes on insomnia that is; type 1 male patient reported more insomnia then their female counterparts. Furthermore, the current study supported the findings of Song et al., (2013) who found significant interaction of gender and type of diabetes on insomnia that is more female type 2 patients reported higher insomnia (poor sleep quality) 63% compared to males (39%). In contrast, Plantinga et al., (2012) found no significant main effects of gender on insomnia (sleep problem).

Similarly, majorities of the studies reviewed supported the findings of the current study in terms of the main effect of gender, ethnicity and type of diabetes on each of the psychological health indicators e.g. Black, (1999); Harris, (2001) found a significant main effect of ethnicity on depressive symptoms in diabetes. Similarly, Baradaran et al., (2006) reported a significant main effect of ethnicity on depression that in the UK, all ethnic minority groups with diabetes have a higher rate of depression than the majority and in the general population. Also, the International Diabetes Federation (IDF, 2002), found a significant effect of ethnicity on psychological health, that is sub-group of people with diabetes is more psychologically vulnerable than the others. More so, the study of Wee et al., (2006) found a significant main effect of ethnicity on quality of life that is quality of life significant difference across patient ethnic groups. In contrast, Wisconsin& Indiana (2002) and Plantinga et al., (2012) findings indicated no significant ethnic group differences in regard to insomnia. However their finding does not support the current study finding in terms of the main effect of ethnicity on insomnia.

In terms of gender main effect on the psychological health indicators, the study of Agbir et al., (2010) found a significant main effect of gender in the rate of depression, with a female to male ratio of (3.1); similarly, in Pakistan Faisal et al., (2010) found a significant main effect of gender on depression to be (females 15.5% vs males 3.6. More so, Olsson et al., (2012) found a significant main effect of gender on insomnia that is, male patients had higher insomnia (sleep problem) than the females. While in contrast, Wisconsin& Indiana (2002); and Plantinga et al., (2012) found no significant main effect of gender on insomnia. In addition, this current study also conflict with a systematic review of literature by Grigsby et al., (2002) where elevated symptoms of anxiety is significantly higher in females compared to males (55.3% females vs. 32.9% males).

In sum, the specific finding of gender, ethnicity and type of diabetes from this current study were overwhelming and is supported with previous empirical studies showing interaction and main effect of gender, ethnicity and type of diabetes on diabetic patient's psychological health indicators.

7.3 Hypothesis Three:

The third hypothesis of this study seeks to test for significant differences in the socio-cognitive factors of diabetic patients by gender, ethnicity and type of diabetes. A multivariate analysis of variance MANOVA was conducted to explore if there are differences by gender, ethnicity and type of diabetes on the socio-cognitive health indicators. Thus, previous empirical research has found that type of diabetes has a significant main effect on various socio-cognitive health indictors of diabetic patients. This was fully supported in the current study, in that type of diabetes showed main effects on each of the socio-cognitive health indicators. However, the finding will be discussed based on the detailed aspects of the ANOVA analysis.

The general finding for the third hypothesis showed that gender, ethnicity and type of diabetes has a significant interaction on self-efficacy, locus of control and religiosity. While for ethnicity and type of diabetes the finding showed a significant interaction on coping. Similarly, gender and type of diabetes showed a significant interaction on religiosity and negative religiosity, while, gender and ethnicity had non-significant interaction on any of the socio-cognitive health indicators.

Furthermore, gender had a significant main effect in each of socio-cognitive health indicators except on optimism. While ethnicity has a significant main effect only on self-esteem, social support, coping, self-efficacy, and religiosity. Type of diabetes had a significant main effect in each of the socio-cognitive health indicators. Although from the analysis the partial eta squared showed, that type of diabetes explains more of the variance (after excluding the variance attributable to other variables) than followed by gender which, in turn, explains more of the variance than ethnicity.

An empirical study conducted in Haifa Israel by Cohen & Kanter (2004) found no significant main effect of type of diabetes on sense of coherence. In terms of locus of control Aalto, et al., (2000) found a significant main effect of type of diabetes on Health Locus of Control. Similarly, Murawski et al., (1970) and Stone & Bluhm et al., (1984; Sabri et al., (2014) reported, a significant main effect of type diabetes on self-esteem.

Also, Macrodimitris and Eldler (2001); Huang et al., (2010); Pretorius, Walker and Esterhuyse (2010); Samuel-Hodge et al., (2008) found a significant main effect of type of diabetes on coping strategies. In contrast, the study of Duangdao & Roesch (2008) found no significant main effect of type of diabetes on coping strategies. In terms of self-efficacy the study of Cherrington, Wallston & Rothman (2010); Talbot et al., (1999); Sacco et al., (2005); Alipour et al., (2012); Kyrios et al., (2006); Sacco and Bykowski (2010) found a significant main effect of type of diabetes on self-efficacy. Similarly, Ridder, Fournier and Bensing (2004) found a significant main effect of type of diabetes on optimism. Furthermore, Kollannoor-Samuel et al., (2011); Rees, Karter and Young (2010); Sacco and Yanover (2006); Malik and Koot (2009); Nefs et al., (2012); Collins, (2006) found a significant main effect of type of diabetes on social support. While Kilbourne and Commings 2009; Kelly, Hertzman & Daniel 1997; and Wahyu et al., 2013) found a significant main effect of type of diabetes on religiosity.

In sum, the significant effect of type of diabetes on self-esteem, optimism, social support, coping, self-efficacy, locus of control, sense of coherence, and religiosity as showed in the present study supported the findings of previous studies discussed above except for the study of Duangdao & Roesch (2008); Cohen & Kanter (2004) which contradict with the present study findings regarding the non-significant effect of type of diabetes on coping and sense of coherence. Therefore, the hypothesis is partially confirmed.

7.4 Specific Response Factors for each of the Hypothesis

In summary, the results of this present study identified the following specific key factors for each of the hypothesis tested:

Hypothesis 1: The pattern of socio-cognitive factors on psychological health shows that, higher manageability sense of coherence, external locus of control, emotional focus-coping, and higher in self-esteem, self-efficacy, optimism, religiosity, social support, and lower negative religious coping significantly associated with low stress, depression, mild anxiety, absence of insomnia and fatigue and had higher quality of life and satisfied with life.

In terms of socio-demographic factorsbeing a type 2 diabetes, with a medium income, married, age bracket between 35-51 year old, civil servant, having a university degree, with duration of diabetic for 6 months and above, having 1-4 children, significantly associated with lower depression, stress, fatigue, mild anxiety, absence of insomnia and higher quality of life and life satisfaction.

More so in terms of religion, the result showed that protestant and patients who lives in town significantly reported mild anxiety, absence of insomnia, higher stress, and low level of depression, fatigue, lower quality of life and were dissatisfied with life.

In terms of ethnic groups patients who are of Igbo significantly reported low depression stress and mild anxiety. Yoruba ethnic group significantly reported lower fatigue, absence of insomnia and were dissatisfied with life, while patients of ‘Others’ ethnic groups significantly reported low quality of life. In terms of gender females significantly reported higher stress and depression, mild anxiety sub-threshold of insomnia, lower fatigue, and quality of life and lower life satisfaction whereas their male counterparts significantly reported lower stress and depression, higher in fatigue, quality of life and life satisfaction.

Hypothesis 2: The general finding showed that gender, ethnicity and type of diabetes had a significant interaction on depression. While for ethnicity and type of diabetes the finding showed a significant interaction effect on anxiety. More so, the finding revealed a significant interaction between gender and type of diabetes on insomnia. While, ethnicity and type of diabetes each had a significant and main effect on anxiety, insomnia, stress, depression, fatigue, quality of life, and life satisfaction. And gender had a significant and main effect on insomnia, stress, depression, fatigue, quality of life, and life satisfaction.

Hypothesis 3: Showed that gender, ethnicity and type of diabetes has a significant interaction on self-efficacy, locus of control and religiosity. While for ethnicity and type of diabetes the finding showed a significant interaction on coping. Similarly, gender and type of diabetes showed a significant interaction on religiosity and negative religiosity, while, gender and ethnicity had non-significant interaction on any of the socio-cognitive health indicators.

Furthermore, gender had a significant main effect in each of socio-cognitive health indicators except on optimism. While ethnicity has a significant main effect only on self-esteem, social support, coping, self-efficacy, and religiosity. Type of diabetes had a significant main effect in each of the socio-cognitive health indicators.

CHAPTER EIGHT

QUALITATIVE METHOD

8.0 Introduction

This chapter shows the specific methods employed in the qualitative component of the research. The chapter is broken down into four sections. The first section provided details concerning the research participants, the sampling procedure and inclusion criteria during the participant recruitment process. Secondly, ethical considerations including confidentiality and data protection issue are addressed. The chapter then focused on the process of data collection and provides details regarding the development of interview schedules. The final section outlined the process used to facilitate data analysis and provides specific examples of NVivo 10 (QSR International Pty Ltd, 1999-2008) functions during this process.

8.1 Participants

Research participants consisted of a sample of diabetic patients (N = 18) made up of subset from the participants in the quantitative study phase 1 who indicated their interest to participant in the qualitative focus group interview. Participants were included if they indicated "YES" to the question asking for their availability and if patients wrote down their telephone number and names in a separate attached form given to them during the administration of the questionnaire phase 1 from the four selected hospitals. Participants were excluded if they answered "No", to the question.

8.1.1 Sampling Procedure

Sampling issues in mixed methods research are inherently practical (Kemper et al., 2003). The results findings from the quantitative data analysis were utilised to guide the purposeful sampling for the qualitative phase of the study. The qualitative part of the study consisted of an in-depth exploration through a focus group interview with a purposely selected nested sample of participants who indicated their willingness to participants in an (interview focus group discussion) during the quantitative phase one of the current studies. More a purposive sampling was suitable in this qualitative phase mainly because the researcher is interested in the representation of participant's ethnic groups, genders and type of diabetes. Similarly, the choice of purposive sampling (Onwuegbuzie & Collins, 2007) was largely to obtain insights into a phenomenon, individuals or event as opposed to making broad generalisations about a population. Purposeful sampling selects participants who are most relevant to answering the research question(s) and is deliberately biased (Buetow, 2007). However, it is the common type of qualitative sampling techniques (Marshall, 1996).

Focus group interviews were chosen for data collection for this part of the study in order to gain the subjective view of participants in-depth and expand on the findings from the quantitative results. One major advantage of focus group interviews is that valuable data can be obtained quickly and cheaply. In other words focus groups are constituted so as to achieve two main aims: firstly, to facilitates interaction among participants; secondly, to maximize the collection of high quality information in the little time available. Some people are also more comfortable in voicing their opinions in the company of friends and colleague than on their own, with an interviewer. More so, even when there is no heated discussion or disagreement, the sharing of experiences can provide valuable insight into phenomena (Parahoo, 1997). Similarly Kitzinger and Barbour (2001) states that in focus group researchers encourage participants to talk to one another: asking questions, exchanging anecdotes, and commenting on each other's experiences and points of view. And at the very least, research participants create an audience for one another.

According to Morgan, (1998) focus groups are used for generating information on the collective views, and the meanings that lie behind those views. They are also useful in generating a rich understanding of participants' experiences and beliefs. Similarly Bloor et al., (2001) suggested four criteria when using focus groups it includes: as a standalone method, for research relating to group norms, meanings and processes in a multi-method design, to explore a topic or collect group language or narratives to be used in later stages, to identify, extend, qualify or challenge data collected through other methods and to feedback results to the research participants. However, focus group is a method that is frequently used in healthcare research Britten in Pope & Mays (1999) Legard et al., in Ritchie, (2003); parahoo, (1999).

A total of sixty four (64) participants indicated their willingness to take part in the focus group discussion; only thirty seven (37) gave their telephone number and were contacted requesting for their availability for a specific date chosen by the researcher in the conduct of the focus group. Twenty four 24 patients were selected to participate but fulfilled the inclusion criteria, based on the participant's availability to attend a focus group discussion for an hour. Participants were follow-up for a reminded for the second time telephonically prior to the data collection date of the study with the help of three public health nurses at each of the three respective hospitals to ensure that participants will still turn in for the group discussion. Other researchers e.g. (Landry et.al, 2011; Johansson et.al, 2008), employed a telephone recruitment techniques in their respective focus group studies among diabetic patients.

Six (6) patients did not show up due to the participating hospital being affected by the Ebola outbreak. The aim of the focus group was to explore the contextual and explanatory factors perceived to have underlain gender, ethnic group and type of diabetes differences in relation to the psychological status and socio-cognitive health of the participant the researcher adopted the American Diabetes Association published guidelines for conducting focus groups which suggests that groups specific to ethnicity yield more valuable information for developing programs that are targeted to assist individual ethnic groups (CDCP, 2003). Therefore, focus groups comprises of ethnicity, gender and type of diabetes specific participants 'selection was also conducted. In this way, eighteen 18 participants were recruited and the table below shows the distribution across genders, ethnic groups and type of diabetes.

Table 8.1 Showing the Distribution of the Eighteen 18 Participants Recruited in the Focus Group

Session/Sites	Type of diabetes	Hausa	Type of diabetes	Igbo	Type of diabetes	Yoruba	Type of diabetes	Others
Babcock University Teaching Hospital	Type 1	Female	Type 1	Male	Type 1	Female	Type 1	Female
	Type 2	Female	Type 2	Male				

University College Hospital	Type 2	Male	Type 2	2Female	Type 1 Type 2	Male Male	Type 2	Male
University of Benin Teaching Hospital	Type 1	Male	Type 2	Male	Type 2	Male	Type 2	3Female

The researcher formed a total of three (3) focus groups. The focus groups had 6 people within each of the three different teaching hospitals: (1) Babcock University, (2) University College Hospital and (3) University of Benin Teaching Hospital. However, each of the three groups meets once for over 45-50 minutes to discuss freely and identify participant's perspectives, as well as to understand their shared experiences about the study topic i.e. the way diabetic patients cope and live with their condition on day to day bases. These purposes are consistent with social scientific uses of focus group (Morgan, 1996; Hughes &DuMont, 1993). Two of focus groups were held at the diabetic patients monthly meeting halls and one was in a private room in the department of public health nursing University of Benin Teaching Hospital.

8.1.2 Procedure for Conducting the Focus Group

The group interview started with a presentation of the moderator and assisting observer followed by an introduction, in accordance with Kreuger and Casey (2000) and Kvale and Brinkmann (2009), so to establish a relaxed and positive environment. Each interview lasted between 45 and 50 minutes and started with the open question: "Please can you describe your experience living with diabetes"? During the interview the moderator encouraged the participants to express their own perspectives and views and respond to statements made by others patients. The moderator asked compatible follow-up questions in order to find out if there were more issues that the participants wished to emphasize. The assistant recorded the group dynamics and interactions, and added complementary questions at the end of the interview (Krueger & Casey, 2000). However, the procedure was explained to all participants including the use of a tape-recorder throughout the discussion, (unless they had any objections to this), and that the focus group discussion would be typed up and reported in an anonymous format. After each focus group session, the investigator distributed a brief questionnaire asking participants to provide demographic information.

8.1.3 Ethical Considerations

All research participants were then asked to sign a voluntary informed consent form upon agreeing to take part in the focus group interview see Appendix C. In accordance with ethical research guideline for human participants, this outlined the purpose of the research, the roles and responsibilities of the researcher, and the rights of the research participant.

Consideration was given to issues concerning the right to privacy and risk from harm (Fontana & Frey, 2005). In addition to use of pseudonyms to protect the identity of participants' a coding metric which facilitated the removal of participants' names from the transcript of the focus group interview was established. This process reduces the possibility of individuals being linked by inference through the disclosure of the participants' name. However, others demographic detail such as participant ethnicity, gender and type of diabetes were included in the analysis so as to ascertain the direction in which the expansion of the study via the conduct of the focus group was based. A full explanation of this is presented in chapter nine where the texts to identified participants quotes are presented in italics with selected details from the participants' transcript.

8.1.4 Confidentiality

Christian (2005) considers confidentially to be the primary safeguard against unwanted exposure. Hence the purpose of the research and all procedures were explained in full prior to the focus group to demonstrate openness, researcher integrity and compliance with research guidelines.

8.1.5 Data Protection

All data relating to participants including names and telephone numbers were maintained in one central paper-based file stored within a secured filing cabinet. Criticisms concerning the effectiveness of data storage methods (Lϋders, 2004) were categorised. Consequently, all electronic-based media including audio files from participants were removed from desktop or networked systems and stored on compact discs as write-protected files. This process minimised risks from unsecured networks, computer viruses, data leaching and accidental wiping. These disks were placed in a secure filing cabinet in order to prevent interference and the possibility of misplacement or theft.

8.1.6 Data Collection Procedure

Consistent with a qualitative method of inquiry that explores multiple and complex dimensions of problem or issues (Creswell, 1998), semi structured interviews were conducted in order to elicit data concerning the experiences of diabetic patients. These formed the primary data source of the qualitative component.

Before commencing on the focus group discussion the researcher piloted the interview schedule guide with four people with diabetes who were in their early forties in order to ensure sensitivity to the research area and to develop and refine prompts. However, these were not included in the main data analysis. Furthermore, the initial interviews with the four diabetic patients were not part of the sampling frame (i.e. as they did not meet the qualitative component inclusion criteria due to an established diabetic complication. This provided useful information regarding the construction of the schedule, the wording of questions and potential prompts. Verbal and non-verbal prompts provide a useful means of clarifying questions and eliciting further information during the main study focus group discussion (Creswell, 1998; Taylor, 2005). After each focus group interview had been completed a verbatim transcript (see Appendix (F) for an example was written by the researcher along with notes containing the researcher's initial reflections of the focus group process.

8.1.7 Interview Schedules

The questions asked were informed by the data analysis performed on research participants' Quantitative phase 1. The semi-structured focus group interview guide was developed, based on the qualitative component aim and research question, see Appendix (E). However, the purpose of the development of an interview schedule guide was to elicit more on the patient's psychological health variables across gender, ethnicity and type of diabetes.

8.1.8 Data Analysis Procedure of Focus Group

The focus group data was analyzed using thematic analysis (Braun & Clark, 2006). Thematic analysis was the appropriate method of analysis because it allowed the researcher to organize the data, describe it in detail and interpret various aspects of the subject under investigation, and was also a flexible analyzing technique. This analytical method allowed for the exploration and interpretation of experiences and beliefs of Diabetes Mellitus patients.More so, it is good practice to obtain an accurate interpretation of the audiotapes, Krueger (1997) suggests that data analysis should be conducted by the researchers attending the group discussion. Using the methods outlined by Colaizzi (1978), data were analysed by the primary investigator, who was also the moderator of the three focus groups.

More so, the three focus group interviews were analysed and coded using a content-driven immersion- crystallization approach to identify major themes. Immersion-crystallization requires researchers to immerse themselves in the data to identify patterns and themes; this process is repeated until the probability of new themes emerging is exhausted (Miller & Crabtree 1999). However, themes are threads of underlying meaning which are gained from condensed meaning units, codes and categories (Graneheim & Lundman, 2004).

This approach is content-driven, allowing the data to stand alone, without being driven by a theoretical model, unlike the deductive approach which begins with a framework on the existing code and serves as a confirmatory approach driven by specific ideas or questions.However one of the advantages lies in it not being attached to any theory making it applicable with a wide range of theoretical models (Braun & Clark, 2006). Similarly, thematic analysis can be used with different methods, which is another reason for its compatibility with focus groups.

The data analysis took an inductive, exploratory approach which is based on the constant comparative methods (Maykut & Morehouse, 1994; Rice & Ezzy 1999). Also this process is supported by the qualitative data analysis software NVivo 10 which was used for the analysis as it allowed participant transcripts to be separated into distinct text units that facilitated line by-line coding (Charmaz, 2008).More so, the data was coded thematically, as this approach was best suited to evaluative health research (Pope et al., 2006), and the transcribed interviews were first read in their entirety to obtain a sense of whole (Elo & Kyngas 2008). Next, significant statements and phrases relating to the phenomenon under study were extracted as units of analysis. Although the focus group interview questions addressed elements of patients' experiences of their illness, transcripts were read with no preconceived expectations of what themes might develop. Phases, units of analysis, were grouped according to their meaning. As categories became apparent, statements were grouped under emerging themes. Each unit of analysis was consistent with a theme that emerged. These themes addressed the participants' experiences of diabetes but also included responses and themes that were broader and incorporate participants' comments about living with diabetes and the social and personal factors that influenced their day to day self-care of their illness. Similarly, in the analysis the researcher quantized the qualitative data to identify frequency of the themes among participants. More so, meaning units were then identified from the transcripts, and meaning units were then condensed and coded manually before using qualitative data management software (NVivo 10). Some examples of codes/nodes were, 'Altering of self-potential' and 'Rejection'. For example a node 'Altering of ones potential' was used to identify instances of this being reported in transcripts. Nodes provide a way of organising data and store references to text data within participant transcripts (Bazeley, 2009). As data analysis progressed coding stripes proved useful for exploring other nodes that appeared at the same sections of text.

Preliminary sub-themes were identified based on similarities and differences in the codes/nodes.The CAQDAS tools i.e NVivo 10 helped the researcher to explore coding incidences and subtle differences in data (Bringer et al., 2006).Prior to transcript being entered into NVivo 10 all references to names were removed, this is to hide participants' identity.

Furthermore, the analysis was continued by going back and forth between the interview transcripts and preliminary sub-themes to refine and validate the content, resulting in eight themes. This classification refers to the manifest analysis on a descriptive level

(Downe and Wamboldt, 1992). However, the focus group data was analyzed in accordance with the stages of thematic analysis which are data familiarization, initial coding generation, searching for themes, review of themes and finally theme definition and labeling (Braun & Clark, 2006).

8.2 Chapter Summary

This chapter established the procedure used during data collection and analysis in the qualitative component of this study and how qualitative data was used within the research process of the study.

CHAPTER NINE

RESULTS –QUALITATIVE DATA

9.0 Introduction

This chapter presented background data for the qualitative sample. It is broken down into two sections. The first provided descriptive data for the qualitative sample. The second section outlined the quotation from respondent transcripts to which the emergent themes are linked.

The data used in the analysis are transcriptions of the taped focus group interviews. From the statements of the three focus groups the analysis of the data identified eight **(8)** major themes with twenty six **(26)** related sub-themes. However, the emergent themes are as follows: Adaptation and Self-management, Personal Impact, Worries about present and future, Medical System Frustration, Non-adherence, Interpersonal interaction and social isolation, Empowerment to Self-management, and Medication and regimen task. These themes are explained and discussed in chapter ten of the thesis in conjunction with other extant literatures.

9.1 Participants Profile

This part of the chapter introduces background data from qualitative data analysis. The qualitative sample (N = 18) were diabetic patient representing a range of ethnic groups in Nigeria. See Table 9.1 for details of the sample. All research participants were recruited using the strategy outlined in chapter six which gives appropriate representative for the qualitative sampling aim.

Table 9.1 Showing the Distribution of Respondent Based on Demographic Variables

Category	**Frequency**	**Percent**
Age		
21-25 years	**10**	**55.6**
26 years and above	**8**	**44.4**

Total	**18**	**100.0**
Sex		
Male	**9**	**50.0**
Female	**9**	**50.0**
Total	**18**	**100.0**
Ethnicity		
Hausa/Fulani	**4**	**22.2**
Yoruba	**4**	**22.2**
Igbo	**5**	**27.8**
Others	**5**	**27.8**
Total	**18**	**100.0**
Type of diabetes		
Type 1	**7**	**38.9**
Type 2	**11**	**61.1**
Total	**18**	**100.0**
Years of diabetes		
1-5 Months	**11**	**61.1**
6 months and above	**7**	**38.9**
Total	**18**	**100.0**
Monthly income		
Less than 5,000	**1**	**5.6**
5,000-25,000	**8**	**44.4**
25,000-45,000	**3**	**16.7**
45.000-65,000	**1**	**5.6**
65,000-85,000	**2**	**11.1**
85,000-105,000	**2**	**11.1**
105,000 and above	**1**	**5.6**
Total	**18**	**100.0**
Marital status		
Single	**7**	**38.9**
Married	**8**	**44.4**
Divorced	**1**	**5.6**
Widowed	**2**	**11.1**
Total	**18**	**100.0**
Educational level		
Secondary education	**11**	**61.1**
University education	**7**	**38.9**
Total	**18**	**100.0**
Number of children		
None	**11**	**61.1**
2-4 children	**7**	**38.9**
Total	**18**	**100.0**
Religion		
Roman Catholic	**4**	**22.2**
Islam	**5**	**27.8**
Protestant	**7**	**38.9**

Orthodox	**2**	**11.1**
Total	**18**	**100.0**
Occupation		
Unemployed	**1**	**5.6**
Civil servant	**3**	**16.7**
Self employed	**5**	**27.8**
Student	**7**	**38.9**
Others	**2**	**11.1**
Total	**18**	**100.0**

The themes and sub-themes that emerged from the analysis of the focus group data are presented in table 9.2 below.

Table 9.2 Themes and Sub-themes Emerging from the Thematic Analysis

Themes	**Sub-themes**
Adaptation and Self-management	*Acceptance & Integration, Opportunity to improve one's health, Information aids compliance.*
Personal Impact	*Finance, Career, Vocational and Physical work, Bearing multiple responsibility for self & others, Altering of one potential*
Worries about present & future	*Living in Uncertainty, Fear of complication, Fear of losing loved ones and job.*
Medical System Frustration	*Insufficient time in consulting, Appointment day frustration, Long waiting time, difficulty in understanding.*
Non-Adherence	*Self-failure to compliance, Failure to adherence due to financial constraints, difficulty of constant diet, failure to compliance due to forgetfulness.*
Interpersonal Interaction and social isolation	*Rejection, Access to social role, Labeling, Criticism.*
Empowerment to Self-management	*Lack of knowledge, Failed expectation.*
Medication and Regimen task	*Dissatisfaction with treatment options.*

From the thematic analysis the result of each domain includes supporting quotes and number of supporting utterances for each sub-theme. Note that the researcher counted repeated references to one sub-theme in a dialogue by a single participant as a single utterance so as to avoid inflating the sub-theme's importance. More so, this chapter cited only one reference in each of the sub-theme. However the full details from the thematic analysis of the focus group is attached in appendix F. Table 9.2 shows various motivational factors and barriers reported among the participants in the qualitative component. These domains are established in terms of their themes and sub-themes which are:

9.2 Theme one: Adaptation and Self-management

The first theme, "adaptation and self-management", was one of the most prevalent quotes in all three focus group transcript with 28 references. More so, the amount of data that were generated for this theme falls within each of these three sub-themes (Acceptance and integration, opportunity to improve one's health, and information aid compliance); each is described with a quotation of the participants.

Sub-theme: Acceptance and Integration

Participants embrace their condition and its management as part of their life in more positive terms that is they accept the disease positively by having some alternative feelings including having hopes, searching for positive meaning, and getting used to the disease. One of the participants expressed conscious effort that stem from the education and explanations usually received from the doctor to have helped to feel that diabetes management problems could be fixed rather than outcomes of personal failings, which in turn ameliorate participant feeling of guilt and frustration. Participants' in these categories sees health, illness, control and management as predictive of the outcome of lifestyle. As such they tend to be the ones that also take personal responsibility of their condition in adapting/making the necessary lifestyle choices, and changing their minds, adjusting in different situation of their condition by making sure they eat a healthy diet and exercise regularly even though to them such tasks seems difficult. More so, these participants attributed what really gave them the motivation was due to the impending danger of failing in looking after themselves as such will likely result in deterioration of the health, as exemplified by this patients comment:

I have being trying my best to be able to manage this sickness called diabetes because most times what my doctor said I shouldn't eat I'm kind of avoiding to eat them even *when the temptation is there you have no option but to avoid eating if you love your life because as human being if you want to just satisfied yourself at the moment then prepare for the worst* ***[Male 42, Yoruba Type 2]***

Sub-theme: Opportunity to improve one's health

Participants see their condition as medium to improve one's health and as well reach out for other in the society in order for them to be aware and take precaution and adjust their lifestyles.

after i was diagnosed with diabetes I got to know the importance of managing my health irrespective of severe family problems I decided to seek for information on the best way I can really manage my health, you know I can said that the diagnosis of diabetes has provided me with a good opportunity to put an eye on my lifestyle and diet. ***[Male 47 Yoruba Type 2]***

Sub-theme: Information aid compliance:

Participants who are well informed or who seek information about their condition adjusted well in managing their diabetes in every day challenges. More so, the participant who sees that sharing of ones experiences with others has been helpful rather than of being in silent by not letting people know about their illness (diabetes).

when I was diagnosed I did not have enough information on what my condition is all about and my wife was troubled too because all what the doctor told us that day that I will be taking the medication he asked us to buy and that I need to avoid any carbohydrate food so we left the hospital that I can still remember how serious it look like for me over one week period I couldn't take food because all available food in the house are more of carbohydrate food. And you know all my children are all married only me and my wife are left at home so the children only come for visit, not until 2 months later when one of my sons visited me, he started teaching me and explaining to me what diabetes is about and how I can really control it and then make a meal time table for me and I still follow that plans till today. ***[Male 50, Others Type 2]***

9.3 Theme Two: Personal Impact

The second theme, "Personal impact", most of the participants felt that diabetes impacted all aspects of their lives. Several comments related to the negative impact, such as finance, career, and work, bearing multiple responsibilities for self and others, and altering of potential.

Sub-theme: Finance

Participants reported direct financial implications as a result of their diabetes, including reduced income from trade, the challenges and the cost of purchasing recommended food for diabetic and the unaffordability of medications cost was also a concern for them.

*I use to sell and have some money but this diabetes has real affected me, I don't use to have enough money again unlike before when I'm not sick... I feel tiredness and weak… so many things on my head, which I hardly due anything this days and that aspect has being affecting me, and any time I'm couched up like that I don't sleep well then …next morning I can't really do anything again you see me so weak****[Female 24, Others Type 1]***

Sub-theme: Career

Participants stated that they find things difficult such as reading books, and described their academic failure as a result of being diabetic. Participants also described how the sluggishness of being diabetic has affected their ability to conveniently attend to the assignment given and as well reduced their class attendance. The participants mentioned the difficult struggle they face in balancing between caring for their health and meeting academic obligations. One participant noted the challenges inherent in concurrently managing diabetes and completing academic tasks.

Having diabetes affect my attendance, I mean have being missing my classes steadily in the school, I have low grades in the exam which ordinarily I know if not because of my present illness I shouldn't have scored lower grades , is it my lunch which use to be different every day and sometimes I missed having my lunch because I have to stay up for the lectures that are arranged for over a stretch of 6 hours without break you know this inconsistence is kind of panicking and sometime you don't seems to just understand how to really put all these things together your condition and your career. ***[Male 21, Yoruba Type 1]***

Sub-theme: Vocational and physical work impact

Participants stated that their income has decreased as they were unable to do their jobs fully.

I'm an auto-mechanic I work on cars so the nature of my job is such that we are prone to injury either we have small cut when we are trying to work in the engine, trying to loosen engine parts and some we try to use our hands to remove components one or two *things from the engine and before you know I will have a scratch, so the thing has being making me to be too careful and then it will slow down my job you know it will also slow down my income.* ***Male 47, Yoruba Type 2***

Sub-theme: Bearing multiple responsibility for self and others

The difficulties of balancing competing needs and looking after oneself and others induce stress and affected patient ability to manage their diabetes in everyday life. Participants described a daily struggle to survive in the face of multiple challenges presented by having to manage not only their diabetes, but also other numerous responsibilities in taking care of others. For instance, participants spoke of struggling trying to obtain basic necessities; feeding the family, paying rent and children school fees; difficult faced in cooking and food preparation for the whole family; and over engagement of oneself for the family to survive. However, when describing how they managed amid such challenges, participant's expressions demonstrated failure of resilience borne of struggle. For example, participants made statements such as, "I have being finding it hard"; "Is not easy for me to cope"; and I find it hard to cope". The following excerpt from the participants demonstrates the sub-theme:

as a driver I have being finding it hard to give account and moreover I have to feed my family and pay house rent, children school fee and everything and as it stands now even as 'am speaking with you 'I'm not fine because so many things that I'm facing.
[Male 24, Igbo Type 1]

Participants reported that their diabetic status has changed their person in a negative term such that they now experience a reduction in physical engagement, exercise and taking church responsibility. One of the participants stated that diabetes has altered her life to non-sociable person as compared to before the diagnosis of diabetes.

*I'm a talkative before, but this diabetes has made me to be a shy person I don't use to talk again am sad, I use to be moody, I just will be looking at people when they pass in-fact diabetes has told me shout up so even now people has started asking me [...] you've change oh you don't talk again this diabetes has weigh me down it has touch my emotion I don't do the way I use to be, I use to be a sociable somebody you know but it has calm me down. [**Female 24, Others Type 1]***

9.4 Theme Three: Worrying about Present and Future

The third theme was "worrying about the present and the future, which depict an apprehensive state of the participants regarding their various worries that were expressed. This theme has the highest number of quotes over 19 references, most data focused on the uncertainty of being diabetic, being afraid of losing loved ones and job, and about possible future complications. However, in a similar fashion, Burke et al., (2006) found that individuals coping with diabetes worry about their ability to control their condition (through diet) over the long term.

Sub-theme: Living in Uncertainty

Participants severally reported that they are unsure about what and how their condition and other personal responsibility will turn out to be. Furthermore, participants in this current study express various sources of uncertainty (e.g., medical as well as social and personal). Medical in a sense that respondent, doubts centered on coping with the treatment plan and regimen, while the uncertainty for most of the participants categorized within this sub-themes stemmed from how to cope with a new diet regime. While that of the social uncertainty primarily focused on the uncertainty participants felt in communicating with others regarding their diabetes; personal forms of uncertainty centered on concerns about the self. Specifically, these included identity concerns and financial issues.

Any time it is just five o clock in the morning […]my mind fly's I will think oh how I will cope that day how is my activity going to look like how am I going to take care of my little kids send them to school then my husband my house chaos then, I will go to my place of business it has never being easy[…] now I don't even make enough of money in my business as I use to make because of diabetes and which money will I use treating myself so is a really problem on my own side presently and […] in time to come who knows how it will be if I don't take care of myself now.
[Female 24, Others Type 1]

Sub-theme: Fear of complications

Participants were concern about their future with diabetes. Participants also identified significant concerns about developing complications of diabetes that would affect other areas of their life and the possibilities to continually be acceptable by people. For instance one of the participants jokingly stated to be very scared about the complication issues as such would denial her opportunity of seeing a man who will be willing to marry her. Another participant reported to be worried that there is only a probability, not a certainty that things will work out fine by not develop complication in the future making reference to the fluctuation of not to have being taking medication on a regular bases due to financial constrain. More, so another participant expresses an intense fear of diabetes complication after seeing other who is already having diabetes complication.

*as a single who is not married the major thing that is giving me concern is on the complication… as I can't just imaging myself as a beautiful girl to begin having foot ulcer, like the other day I saw people with bandages, and others having amputation you know because of this diabetes you see the future is too beautiful for me, now by the time I start bandaging my legs because of may be complications of a thing do to diabetes what will happen to me it will not be fun because men will run away from me so I don't think I will like that, but how long will this illness diabetes continue every time you will be adjusting- adjusting, today you are on this , tomorrow you are on that so … my future is really given me concern as a single with diabetes.**[Female 22, Hausa Type 1]***

Sub-theme: Fear of losing loved ones and job

Participants see their diabetic status as barriers and threat to their social relationship and jobs. One participant worried about disclosing her diabetic status to her fiancés. This patient feels that informing her fiancé might result a cancelation of their engagement.

My biggest problem as a diabetic patient is that I just feel physically weak and the work I do required to be up doing you know after my retirement I only go for jobs for people that is farming so because of this diabetes I can't really do much and it gives me concern because since the farming I do is only what I used to take care of my health and my family if I'm not able to work well to the standard in the cultivation of the farm land as required then I may stand chance of losing the work. ***[Female 68, Others Type 2]***

9.5 Theme four: Healthcare System Frustration

The fourth theme was grouped into "healthcare system frustration", where patients encounter various struggles while seeking the management of their diabetes. Mostly the participants attributed insufficient time during consultation with their doctors, feeling frustrated in every appointment days, waiting for a long time before seeing their doctor, and the difficulties in understanding recommendation.

Sub- theme: Insufficient time in consulting

Participants noted that their doctors did not spend enough time explaining the treatment, most of them identified this barrier especially when they are discussing with their doctors, that the doctor usually discusses with them in brief and explains things in hurry. Participants worried about the nature of the hospital unfixable appointment times and wished that the appointment interval could be within may be two weeks instead of the usual interval months. Moreover, these participants called for more flexible appointment time intervals, for the purpose of any emergency need noting that the fixed appointment schedule prevents them from seeing their doctor until their scheduled appointment. One participant reported that their health care provider does not listen to their individual needs.

*when you ask question the way the question will be answered will be just in hurry and some time you will be told don't worry, we will talk about that next time, and then you will be like trying to say something but at the end of the day you be rushed. So you like a blind person who is being directed on the way to go because you don't have your own control for your life. [**Female 43, Others Type 2]***

Sub-theme: Appointment day frustration

Participants expressed frustration about the situations they encounter especially on their appointments days, seeing other patients whose condition are worst especially those patients who had amputation, blindness or other serious consequences of poor diabetes control, affects participant emotional health and induces lack of motivation and feelings of apathy towards life . One participant indicated giving up the treatment, while another participant felt confused in the clinic day talk or recommendation from the healthcare providers.

*it makes me feel down especially when I go for visit [...]it has always being giving me serious tough time, to wake early that day to meet up because if you don't go early you will not come back early[...]you will stay on the cue before your own turn will get to you from there to payment point, do test before you will be done, so it always weigh my spirit down And you go there you will see other people with "big-big" wound on their legs I will ask what kind of wound is this, I will be told that it is diabetes that cause it and I will say ahah my own has not gotten to this level o so later on I will be thinking does it means that ehm if I don't take care of myself my own will also get to this level at times I will boast into crying. **[Female 24, Others Type 1]***

Sub-theme: Long waiting time

Participants described feeling of frustrated as result of struggles to see their doctors, facing a long waiting time between appointments for their health services.

*On the appointment day as you see just as the doctor also gives you appointment likewise he also did give other people appointment too. For you to be able to see the doctor when you come for your appointment you will seat down and be waiting till whenever you will be called. [**Male24, Igbo Type 1]***

Sub-theme: difficulty in understanding

One of the participants reported the difficult in understanding recommendation from the doctor and attributed this barrier to be the level of his education.

*when you go to the hospital , doctor will be telling me about these things you know that I should be doing and my problem is that I'm very slow to learn because of my level of education so seriously this diabetes issue, if you ask me I have not gotten myself till today. [**Male 24, Igbo Type 1]***

9.6 Theme Five: Non-Adherence

The participants in the fifth theme category are described as non-adherence, they did not adopt a healthy lifestyle, and they did not follow many of the activities of their self-care regime, especially prescribed dietary change. Participant admitted noncompliance with diet therapy; other attributed failure to financial difficulties as barrier for their noncompliance, and forgetfulness.

Sub-theme: Self failure to compliance

Participants reported they battled every day with the temptation to continue indulging themselves in food that warrant for restriction finding it difficult to compliance irrespective of how knowledgeable of the danger, they attributed their attitude as a weakness of self-failure.

*the few once i know I find it hard to keep them […]I was tempted longer throat will not allow me, so I will just say let me eat for today, after now then tomorrow I will not do it again. My problem is, I'm not consistence in taking care of myself so I fail myself because of longer throat so changing from one lifestyle to another new lifestyle is hard that is a difficult thing that I'm facing. [**Female 24, Others Type 1]***

Sub-theme: Failure to adherence due to financial constraint

Few of the participants felt that it is usually very difficult to adherence and keep up with the appointments because of financial constraints, distance from the hospital.

*I'm not really adhering to doctors ehm instruction, I'm not meeting up my medications expectation often times I get run short of my medications, because no money sometimes to buy so these are the things, and even some time you will not have transport money to come to the hospital because I live far away from this hospital you see when I don't have money to purchase my medications you know I will be so distressed at that point I know that anything can happen to me so in such a case I'm very worried.[**Female 22, Hausa Type 1]***

Sub-theme: Difficulty of constant diet

Participants expressed that "it is difficult to change their pattern of eating from eating eba, yam to wheat. One participant also expressed the feeling of emotional discomfort in restricting oneself from eating what she has taste for and following a particular diet plan.

*I try to see that i meet up but it is not easy, and certain things I'm asked to avoid is so inconvenient to me that is why I'm telling you that this not a small illness, as I find it very difficult because it consumes money, it consumes energy and thing are hard for me [...] that I cannot be able to meet up in things they ask me to avoid [...] things I use to eat for example from kids I started eating eba, fufu, and yam , but now I don't eat them only eating wheat that is so frustrating to me.**[Female 49, Igbo Type 2]***

Sub-theme: Failure to compliance due to forgetfulness

Participant reported to have failed in both medical aspects of a regimen like medication and as well with the lifestyle aspects such as diet. Participants expressed that often time they forget to take their medication amidst in their business and career schedule. One participant attributed hunger for non-compliance.

I often time forgotten taking my medication and I will remember oh I have not taken my medication and by that time I might be in the lecture hall so coming back home to take my medication is so hard and apart from that when it come of adhering to doctor instructions I think I have failed myself greatly several of the times I will just say to myself today let me take this one then after today I wouldn't do that again but its seems as if I see myself doing this thing over and over so several times I have failed myself[...] I have different color of bags like today I will package this ehm my kits in a particular bag , then tomorrow because of the way I want to dress may be I will not *carry that bag so I will forget so this are challenges like myself as a student is not really easy.* ***[Female 22, Hausa Type 1]***

9.7 Theme six: Interpersonal Interaction and Isolation

The sixth theme, "Interpersonal Interaction and isolation refers to stigma and discrimination experienced in the context of social relationships, for instance for these participants the diagnosis of diabetes resulted in a reduction of social contact. This had to do with the social effect of diabetes such as dealing with the judgmental reactions from others, experiencing negative effects on social relationship for instance participants reported facing rejection resulted for being diagnosed with diabetes, isolating themselves from social events, fear of being labeled as sick, and the criticism from participants close friends who saw them used insulin injection.

Sub-theme: Rejection

Participants reported that they are rejected by people around them for being diabetic. However, a sizable minority of participants explained how they are being affected to face rejection. One of the patient described rejection in terms of self-perceive rejection rather actual already occurred experience.

you see, do you know that the first time I came back with the result of diabetes I showed my husband, my husband say you're leaving this house today if not of God intervention that my husband left me in the house he want me to pack, send me packing, […] if not of my little kids were crying daddy don't do that, you see is so frustrating and annoying that your husband that married you will tell you to go out of the house because of one nonsense illness they call diabetes. ***[Female 24, Others Type 1]***

Sub-theme: Access to social role

Participants described avoiding social life and gathering as to keep one off for not being suspected to be diabetic especially from the cultural group where they belong. Attending social events was particularly a difficult issue due to questions participant assumed to be asked by members of her cultural group the reason for the unexpected refusal she may express for not drinking soft drink. Consequently, participant reported feeling socially denied to be continuing in participating in the social role for being a diabetic.

I stop to be going to gathering […] for me i don't want people to know about it, I'm trying to restrict myself I use to belong ehm to this our age group mate club as a married women [...] that is the way we do for people who comes from our culture, so I have to single myself out so that they wouldn't know I'm diabetic because every time they will ask me madam why you don't take mineral again when did you start stop taking mineral I will just be like no, I don't want them to know about it, so instead let me stop to be involving myself in those gathering so that they wouldn't know what is happening, even in my maternal home too you know all these matrimonial home my sister in-law, mother-in-law they can talk, so I hide myself and now I don't want anybody to know so that if I hide myself a little from people ehm you know that will be better for me. ***[Female 24, Others Type 1]***

Sub-theme: Labeling

Participant's felts they do not want to sit outside the door of the diabetes ward and show their handicap as such want to hide their illness in order to be accepted on healthy people's terms and not to be questioned as to avoid being labeled as sick.

for me it not really easy to even come and expose myself like that and tell the whole world that you have diabetes [...] even my visitations you know to the clinic I keep it secret, I use to go late when even I have appointment because people are already going, for me you just don't know what it look like exposing myself seating in the diabetic clinic and people sees me as diabetic I don't want to expose myself like that. ***[Female 40, Igbo Type 2]***

Sub-theme: Criticism

Participants feared to be criticized and reported to have received criticism from friends. Participant's expresses restricting their social life for fear that people around them don't understand them and their problem. This imposes the awkwardness of sadness.

If I allow them to know about my diabetes they will worsen my situation, they give frustration, I will not enjoy my marriage again they will be using my name to talk, ehm this one she is diabetic she will be eating all her husband money I don't want them know that is why I have to avoid them as to hide it. ***[Female 24, Others Type 1]***

9.8 Theme Seven: Empowerment to self-Management

The seventh theme, "was empowerment to self-management", which identified how participants described their limited knowledge and awareness of their diabetes. Participants also reported how their expectation of outcome of their self-care failed them. Participant's statement expressed the need for empowerment that is, creating a patient-centred and collaborative approach to match the fundamental realities of diabetes care from the time of diagnosis in helping patients discover and develop the inherent capacity to be responsible for their own life.

Sub-theme: Lack of Knowledge

Participants reported to be less knowledgeable about diabetes management, as they clearly found it challenging, which then upsets them by not knowing how to take care of their diabetes specifically on the dietary issue. One of the participants described such a situation to be tantamount as unproductive in controlling for the condition.

when you have no knowledge on what to do especially when you needed such information that will disturbs you, so you know the whole thing just keep upsetting me as you don't know amount of food, I mean the one that has too much carbohydrate, so all I'm doing is what I think is okay which I might not be doing what is really needed to help my condition, I'm just like guessing. ***[Female 42, Hausa Type 2]***

Sub-theme: Failed expectation

The failed expectation within this category includes expectation of self and others. Participants expresses being disappointment against their self-expectation for inadequate outcome of self-care, and they described how their effort turned unfruitful. One of the participants reported how difficulties it is to achieve normal sugar level and another participant was burdened on the manner in which government have neglected diabetic patients not assisting them in their areas of needs.

It has all being a sad experience to be diabetic, you can't just believe that you are doing everything possible that you know is right for your life to be going well with diabetes still you see problems kept on coming over and over again then you will be like what next as there is actually nothing you've not done to your ability so tell me you got to prepare for the worst to happen this has being a big challenge for me so you see I feel like some days not even taking my medications after all what's the point. ***[Female 68, Others, Type 2]***

9.9 Theme Eight: Medication and regimen task

The final theme generated by the focus group was problems concerning treatment, the first involving fear of taking insulin injection, the second was refusal towards performing self-injection except being assisted by a nurse at the start of the insulin treatment, while the third was that injection are too troublesome to be taken every time .

Dissatisfaction of treatment options

Participant voiced their dissatisfaction on the available treatment and wish for treatment options of which is out of reach. As directly expressed by one of the participant that the continuation of injecting insulin is scaring which the participant worries and felt hopeless as there were no another alternative other than keep having the needle every day.

when I was told that I had to start injecting myself with insulin, In fact I refused to let anyone give me insulin except a trained Nurse because my parents was like asking me to go the chemist , each time I need to inject insulin I have to go to the chemist, not just of recently that I finally manage to give myself insulin, and that was the hardest things I have ever had to do in my life giving myself an injection about three to four time a day it kind of imprisonment as I don't have any freedom again in my life. So many times i rather will take one or two noodle in a day because I have had so much piercing in my body. [***Male 21, Yoruba Type 1]***

9.10 Chapter Summary

This chapter provided data concerning the qualitative sample. It highlighted several difficulties, and motivational factors influencing participants' self-care management of their diabetes. Having introduced these factors, the next chapter presented the discussion from the thematic analysis of the qualitative component.

CHAPTER TEN

DISCUSSION OF QUALITATIVE FINDINGS

10.0 Introduction

The aim of the qualitative component (focus group) was to complement the results of the quantitative study in phase 1 of this current study which identified internal and external factors contributing towards diabetic patients' challenges to successful disease management. The focus groups did help to identify various difficulties and enablement factors experienced by the participants that could be associated with poor health outcome among male and female patients. Differences in ethnic groups did seem to have an impact upon the attitude and behaviors toward the topic under discussion. The results of the analysis showed type 2 male participants were more motivated with their lifestyle than other groups of study participants in this study; i.e. males and female's type 1, and females with type 2. In contrast, these groups of participants voiced their experiences of struggling to live healthy lifestyles due to hindrances and various difficulties which they felt were out of their control such as lack of finance to care for their diabetes.

10.1 Comparing and Contrasting the Two Types of Diabetes by Gender from the Emergent Themes.

To encapsulate the main differences from the emergent themes between the two types of diabetes based on gender of the participants. The result of the focus group analysis shows that type 2 male participants were more adaptive to self-care management of their diabetes than type 1 males and females, and that of type 2 females. Other differences in the themes that emerged in the conversations of the focus group were that of the personal impact. More so, male and female participants within the two types of diabetes elaborated how they felt, that diabetes impacted all aspects of their live, the frustration they usually encounter while seeking for treatment, they also expressed worries about their diabetes at the present and in future time. Similarly, concerns about the present and the future was identified as 'a realistic issue' for persons with type 1 and 2 diabetes among male and female participants except for participants who are type 2 males. Interestingly, Sue et al., (2007) found that people with type 2 diabetes expressed worries for their present and future in living with their diabetes. Furthermore, the present study findings have added to this past work of Sue et al., (2007) in terms of gender difference within the two type of diabetes.

Additionally, issue about non-compliance was a major concern for the participants in this present study as they voiced out their inability to adopt a healthy lifestyle. The participants described how they face isolation from people around them, and reported intake of medicine and regimen as hard tasks. This was more dominant for the participants except for people with type 2 males. However, female participants in this study felt the need for empowerment as to enable them manage their diabetes.

10.1.1 Sub-themes Comparisons with Other Studies

The results of this present study largely agreed with most previous studies regarding the day to day experiences of living with diabetes (Skelly et al., 2005, Lerman, 2005). However, this will be described and discussed thematically according to the emergent sub-themes from the present study.

10.1.2 Acceptance and Integration

The result of the present study gives evidence that male types 2 diabetic patients apparently accept their new life situation with the disease. Also, their acceptance and integration of their new situation provided motivation in getting on with life and managing the demands that are made rather than acceptance geared to escape-thinking about the disease. However, these participants' descriptions indicate that they strive towards taking care of themselves to reduce the influence of the disease on their lives and social functions. More so, the acceptance and integration showed by the male type 2 participants expanded and explained more on the interaction between gender and type of diabetes observed from the quantitative phase one of this study. This evidence confirmed that such acceptance of diabetes by type 2 males is not an illusory one. More so, the males with type 2 demonstrate a great personal responsibility involving their care and their own health processes. This indicates a form of true acceptance as it aims to decrease their suffering and adjustment to their diabetes. Similarly, participant's acceptance and integration were propelled as they recognized that diabetes is a fact and there is no other alternative or choice, if they want to feel well they have to be "adaptable" to their illness, which makes demands that have to be reconciled; demands that must not be allowed to "govern" their lives. Similarly, the remark made by Roy & Andrews, (1999) supported the sub-theme of acceptance and integration that many people with diabetes are faced with the task of adapting to their chronic health condition, which involves the process of thinking and feeling, the individuals use conscious awareness and choice to create human and environmental integration.

Furthermore, the expression of type 2 male participants from the analysis indicates that they do not want to become ill and that even if they are ill with diabetes they want to continue the same life and be the same person as before- although they now carry a disease.

10.1.3 Opportunity to Improve One's Health

The diagnosis of a chronic disease such as diabetes mellitus can be a shocking and life-altering event. Conversely, a diagnosis of a chronic illness can also offer the patient opportunities to change unhealthy Behaviors such as poor diet, smoking, and lack of exercise, making them healthier than before their diagnosis. This is referred to as "benefit finding". Some of the participants in the present study described how their illnesses have given them opportunities to improve their health. Similarly, in a study conducted by Moonaghi et al. (2014)among diabetes patients in Iran, an emergent sub-theme of modification of Behaviors was presented with statements of the participants that diabetes gave them an opportunity to change their unhealthy habits, which they perceive as ruining their health but did not previously have enough willpower or incentive to stop. Also, it provided an opportunity for patients who were sensitive to their health to adjust their life goals and expectations. The authors concluded that, despite the difficulties of having diabetes, it may also have positive effects for those diagnosed. Furthermore, the participants in the present study who expressed that the diagnoses of diabetes offer them an opportunity to improve their health share the same kind of benefit finding reported by Moonaghi et al. (2014).

10.1.4 Information Aids Compliance

Participants in this study who were motivated in seeking information about their conditions were able to adjust well in managing their diabetes. Conversely, Preston et al., (1999) findings is congruent with the sub-theme of ‘information aid compliance’. The authors reported how participants in their study who seek appropriate information were well adjusted and more certain of their health, reassurance, able to build confidence, and a sense of control with their condition. Similarly, other researchers e.g. (Malpass, Andrews, & Turner, 2008) argued that more specific information should decrease uncertainty and increase motivation in those living with diabetes. More so, Brashers, Goldsmith, & Hsieh, (2002) refuted the position advanced by Malpass et al., (2008) that information does not necessarily lead to a reduction in uncertainty and may actually increase it.

10.1.5 Finance

This results of this study showed that female gender across the two types of diabetes described their financial constraint in everyday life with diabetes. They stressed that changing lifestyle, for example, food choice, needs sufficient finances, as they struggle to meet the requirements because they lack sufficient finances. Similarly, the finding of Mshunqane et al., (2012) among people with type 2 diabetes supported the result of this currents study in terms of the financial constraint patient’s encountered. More so, Sue et al., (2007), reported in their study that women expressed concern about the overwhelming economic cost of diabetes and its devastating complication. Furthermore, Sue et al., (2007) argued that appropriate disease management is costly and may be a factor when considering program development.

10.1.6 Career

According to the result of this study, there is a need to develop and provide support services to patients who are university students with type 1 diabetes. The categories of participants from this current study encounter various challenges within the school environment, from integrating diabetes into their life, issue of identity as university students living with diabetes, lack of awareness and support within the university community. The finding of this study is congruent with a study conducted by Wdowik et al., (1997) among college students with diabetes in terms of the impact of non–supportive school environment which poses challenges on their condition and career.

10.1.7 Vocational and Physical work

There is substantial evidence that an individual with diabetes who engages in low levels of physical activity do have detrimental consequences in reduction of income (Morrato et al., 2003; Lim, & Taylor 2005; Hays, & Clark 1999; Wood, 2004; Ford & Herman.1990). Besides, Wenzel et al., (2005) reported how a male participant in a focus group conducted among African Americans living in rural areas with type 2 diabetes described himself as "so tired it was like my muscles weren't working". Similarly, patients in this present study voiced a significant decrease in their work performance and felt that they were no longer able to do their job fully. However the above-referenced studies are congruent with the finding of this present study.

10.1.8 Bearing Multiple Responsibility for Self and Others

This current study identified how participants struggle with the challenges of being diabetic such as bearing multiple responsibilities. Similarly, other previous studies e.g. (Glasgow et al., 1997; Petterson et al., 1998; Ward et al., 1997; Lignowska, 1989) have reported that men with diabetes experience less disease impact and more treatment satisfaction than women possibly due to the different roles that men and women occupy in society. More so, the authors noted that women have multiple role responsibilities and may find the diabetes regimen difficult to fit into their busy lives. on the other hand, men are typically more narrowly focused with their roles and responsibilities and possibly less likely to let the diabetes regimen interfere with their life.

In this current study female participants reported struggling in taking care of their diabetes more than their male counterparts amidst of multiple responsibilities. On the other hand this current study supported previous findings such as the study of (Finucane & McCullen, 2008), that balancing family and work responsibilities may complicate diabetes management because of feelings of obligation. Additionally, the gender consistent findings between this current study and previous studies could be attributed to the fact that participants in the previous studies are mainly people who are of low socio-economic status. Similarly, in Nigeria people generally struggle to survival the hardship in the societies which affects more of the female genders. Moreover these previous studies were conducted in the developing countries this could mark why women experience more impact of diabetes as elicited by bearing multiple responsibilities.

10.1.9 Altering of One self's –Potential

The diagnosis of DM and the patient's recognition of the disease affect not only the process and demand of lifestyle changes but also by organic and functional alterations of patients' potentials. The emergent sub-theme of 'Altering of one self-potential 'from the current study finding showed how the respondents perceived change in their roles or the way they view themselves, more so some participants discussed how diabetes had affected their usual social role, within their close relationship and personal obligations.

10.1.10 Living in Uncertainty

Available evidence within the literature indicates that uncertainty surrounding a health condition may substantially influence the way individuals understand, integrate, and communicate about illness (Brashers, 2001). Although uncertainty associated with chronic illnesses (diabetes), may pose unique challenges to individuals because doubts can persist or become cyclical over time and uncertainty is often germane to the experience of chronic illness, (Mishel, 1990). But the nature of uncertainty is not necessarily uniform across various conditions or diseases (Santacroce, 2003). Furthermore, the findings of this present study are somewhat consistent with existing literature that have reported issues related to uncertainty in people with diabetes e.g. (Brashers et al., 2003; Carnet Martin et al., 2010; Mishel, 1990). The specific content of uncertainty reflects the unique challenges of living with diabetes (Sunday & Eyles, 2001). However, the medical, social, and personal sources of uncertainty appear to reflect the experiences of the participants in this current study and other extent literatures are in support with this findings e.g., Brasher et al., (2003) found that issues such as complex medical regimen (medical), renegotiation of relationship (social), and finances (personal) were sources of uncertainty among people living with HIV. Similarly, Ternulf (1990) studied individual experiences over the trajectory of diabetes, uncertainty regarding diabetes-related information and the complexity of the diabetic regimen emerged as predominant themes. , Mason (1985), also found multiple concerns related to both type 1 and 2 diabetes, such as Urine testing, oral medication, diet, and diabetic complications. However, the existing literatures on uncertainty remain relatively fragmented and incomplete specifically in people with diabetes, besides this current study has added to the existing body of knowledge which the participants of the current study expressed same concerns that was noted in previous studies in people with HIV in particular. Although, Manson (1985) and Ternulf (1990)'s findings provide some indirect evidences for the sources of uncertainty in diabetes, their findings are limited in several key respects, yet individuals living with diabetes often experience concerns beyond medical domains, including the impact of diabetes on social interaction or the quality of their relationship with others (Burke et al., 2006).

Furthermore, the current study provides grounded account of the sources of uncertainty in diabetes which is a common theme in research to provide-patient communication and educational or interventional programs for individuals living with diabetes. For instance, uncertainty is a key concern in diabetes management (Callaghan &Williams, 1994).

10.1.11 Fear of Complication

Fear about the future complication has previously been found to hang over the heads of some young people with diabetes like a 'sword of Damocles' (Peters & Laffel 2011; Cameron 2012; Markowitz & Laffel 2012). This present study indicates that female participants who saw their fellow diabetic patients that have complications during their usual hospital consultation feared that they are in danger to suffer similar consequences. A similar finding was reported by Skelly et al., (2005); DeCoster, (2003) in their studies. They opined that persons with diabetes are aware of the complications of diabetes (particularly amputation, blindness coma, and death) and have even observed these complications in relatives and friends. However, complications can be distressing not only in and of themselves, but also because they can undermine young adults' life plans and career aspiration which the female's participants in this present study expressed concern for and this could be attributed to their perception of vulnerability, as such could potentiate anxiety.

10.1.12 Fear of Losing Loved Ones and Job

The demands of diabetes care are enormous and for the working class patients, their condition threaten their job security which in any normal circumstance could induce a state of permanent stress as patients attempt to satisfy their work load demand or employers. Not surprising patients are concerned of the fear of losing their job. Participants in this present study, showed apprehension on the possibility of losing their job. Additionally, this current study finding is comparable with the studies conducted by Shiu & Wong, (2002); Shiu et al., (2003) on perceptions of social stigma and the influence on diabetes self-management in Chinese patients with type 2 diabetes, whereby the authors found fear of losing jobs as one of the recurring themes.

10.1.13 Insufficient Time in Consulting

At the level of diabetes care provision one of the barriers identified in the present study was insufficient time in consultation this hinders patients' adequate access of their health care. More so, this current study revealed the extent at which respondent's worries on the unfixable time in consulting and suggested for more fixable consultation and quality clinic hours with their physician. However, this emergent sub-theme of'insufficient time in consulting 'from the current finding is favourably paralleled with the study of Pera (2011) who reported a focus group discussion conducted among people with diabetes in a public hospital in Barcelona, Spain that patients managed in primary care criticized their medical care, as they complained of the waiting times, and shortness of consultations.

10.1.14 Appointment Day Frustration

This current study showed, that participants usually get frustrated when healthcare providers do not give them proper attention or listening to their request, and they felt dissatisfied in their relationship with them. More, so the findings of this study indicates that participants worries about their long awaiting appointment intervals and the attitudes of their health care provider on how they usually explain to them in hurry during their consultations. A similar finding was also observed whereby patients demonstrated dissatisfying relationships with healthcare providers in a study with insulin-dependent diabetic patients conducted by Zoffman and Kirkevold (2007). More so, many participant in this present study expressed frustration when their health care provider did not listen to them. Similarly, this current study finding is in congruence with the result of Claydon et al., (2013) who examined the impact of living with diabetes among minority ethnic groups, these authors findings demonstrated that patients expressed concerns of not being heard and being ignored, which led to feelings of frustration and disempowerment. However, these studies suggest that healthcare professionals need to listen more carefully to the voices of the patients as to avoid or prevent the patient not to exhibit a resistance to the orders they received.

10.1.15 Long Waiting Time

This current study identified long waiting time as one of the healthcare system factors. Similarly, many other studies e.g. Grunebaum et al. (1996); Balkrishnan et al (2003); Moore et al (2004); Lawson et al., (2005); Wai et al., (2005), found that waiting time visit for clinic visit was a great sources of concern for patients.

10.1.16 Difficulty in Understanding

Illiteracy imposed a significant barrier to understand communication between healthcare provide and patients. Interestingly, Lam et al., (2004) reported in their study that diabetic patients with low literacy were found to experience significant barriers to health care as well as a lower treatment satisfaction Saatci et al., (2010), and a poorer health outcome Goudswaard et al., (2004). This is similar to the finding of this present study. However, it has been observed by Lesley et al., (2015) in their study among people living with type 1 diabetes that when health care professionals seemed distracted or disinterested, or used complicated language and jargon, during clinic consultations, children and adolescents in particular reported feeling confused and frustrated, and saw little benefit in attending clinic. These findings echo the studies of (Tates, et al., 2002; Waller, et al.,2005), that poor communication skills resulting in children and adolescents sometimes feeling excluded from consultations, being confused about treatment regimens, and losing confidence in managing their condition. Interestingly, it is imperative to note that the poorly educated DM patients observed in the present study encounter difficulties in understanding what the healthcare provider do communicate.

10.1.17 Self-failure to Non-compliance

Non adherence was reported in 7 studies from five countries, including Brazil, (Peres etal., 2007; Croatia, Vinter et al., 2004; Malaysia, Al-Qazaz et al., 2011; Mohd Ali, and Jusoff, 2009; Spain, Lai et al., 2005; the USA.Hu et al., 2013; Rustveld et al., 2009).Participants in this present study attributed their non-compliance as self –failure and expressed their difficulties in area of behavioral change. Conversely, a study done in Mexico demonstrated that patients with type 2 diabetes could not follow the diet because of the difficulty of changing their dietary habits (Hernandez-Ronquillo et al., 2003).

Hence, this current study observed huge difficulties voiced from both genders across type 1 and type 2 participants except for the type 2 males' participants, while participants from both minority ethnic group (Other) and majority (Yoruba & Igbo) were found in this current study to have comparatively poor compliance issues. More so, the findings of Lerman, (2005) support the current study on the issue of non- compliance which the author reported that person with diabetes have difficulty being compliant with their self-management regimen. However, in another development researchers e.g. Degoulet et al., (1983); Kiortsis et al., (2000); Lindberg et al., (2001); Fodor et al., (2005) found that female patients have better compliance, while similar studies suggested otherwise e.g. (Frazier et al., 1994; Sung et al., 1998; Caspard et al., 2005; Hertz et al., 2005). In addition, some studies could not find a relationship between gender and compliance (Menzies et al., 1993; Buck et al., 1997; Horme & Wenman 1999; Senior et al., 2004). Hence, these evidences indicate that gender may not be a good predictor of non-compliance because of the inconsistent conclusions. In this study, the finding showed that gender is also a complex issue for compliance, as male's gender of type 2 showed more compliance than type 1 males and females of both types of diabetes.

On the other hand participant ethnicity has been compared in the various studies e.g. (Didlake et al., 1988; Riaiz et al., 1999; Thomas et al., 2001; Yu et al 2005), that Caucasians are believed to have good compliance, while in other studies (e.g. Schweizer et al., 1990; Monane et al., 1996; Leggat et al., 1998; Butterworth et al., 2004; Kaplan et al., 2004; Dominick et al., 2005). African-Americans, Hispanics and other minorities were found to have comparatively poor compliance. However, it is of importance to note that a plausible explanation for this may be due to patient's lower socio-economic status barriers of the minority in the study countries. Hence, due to these confounding variables, ethnicity may not be a true predictive factor of poorer compliance. Although the findings in this current study indicated that both minority and majority ethnic group participants' battled with non-compliance issues.

10.1 18 Failure in Adherence Due to Financial Constraint

Cost is crucial issue in patient's compliance especially for patients with chronic disease as the treatment period could be life –long (Connelly 1984; Shaw et al., 1995; Ellis et al.,2004; Ponnuanker et al., 2004). Realistically, healthcare expenditure could be a large portion of living expenses for patients suffering from chronic disease. More so, for diabetes management, the rate of compliance among type 2 patients to diet varied from 25% to 65%, and for insulin administration was about 20% (Cerkoney and Hart 1980). Interestingly, more than 20 studies published in the past few years found that compliance with oral medication for type 2 diabetes ranged from 65% to 85% (Rubin 2005). As a matter of fact, if the patients do not fellow or adhere to treatment plan faithfully, the intended beneficial effects of even the most carefully and scientifically-based treatment plan will not be realized. Hence, for this current study compliance should not be a burden if the patients have a relatively high financial income but a number of studies on other chronic diseases found that patients who had low income (Cockbum et al., 1998; Berghofer et al., 2002; Benner et al., 2002; Ghods and Nasrollahzadeh 2003; Hernandez-Ronquillo et al., 2003; Mishra et al., 2005) were more likely to be non-compliant to treatment. Similarly, the current also found that patient non-compliance was occasioned by lack of financial constraint. Therefore, healthcare expenditure is very important factor for patients with diabetes because the treatment could be life-long so the cost of therapy would constitute a large portion of their disposable income. Since the patient in this present study feels that the cost of therapy is a financial burden, the compliance with therapy will definitely be threatened. As such healthcare personnel should be aware of patient's economic situation during the planning of a treatment regimen, and a healthcare finance system that provides at least some financial assistance to low income patients would be helpful to boost compliance.

10.1.19 Difficulty of Constant Diet

The results of this present study showed that participant's lifestyles, in particular the cultural components of their diet lifestyles, were not considered in the management plan; instead, dietary options were simply imposed and found difficult to adhere to. This result is in agreement with the findings of a study conducted by Mustapha et al., (2012). More so, this implied that the diet prescribed by the treating doctors was not compatible with their lifestyle and culture of the participants. These findings suggest that doctors and dieticians need to understand specific social and dietary customs of the patients. However, in this study participants felt that no one else understood their situation or experiences of living with and trying to manage their diabetes. In this regard, they may very well be correct. If a doctor does not ask a patients what his or her preferences are regarding diet, the patient will never feel that their treatment is specifically tailored to them and will continue to believe that the doctor simply "does not understand or care".

10.1.20 Failure to Comply Due to Forgetfulness

Forgetfulness is a widely reported factor that causes non-compliance with medication or clinic appointments (Cummings et al., 1982; Kellway et al., 1994; Okuno et al., 2001; Hernandez-Ronquillo et al., 2003; Ponnusankar et al., 2004; Wai et al., 2005). In Lebanese study among people with diabetes forgetfulness- are found to be overwhelming to sufferers of the disease and to impact directly on their social life in the form of lost opportunities to interact socially or a compromise in the quality and frequency of such interactions, (Mustapha et al., (2012).

Furthermore, patients reported skipping medicine doses due to forgetfulness or they did not take their medicines on purpose. Forgetfulness in terms of taking medicines was observed more often in patients who did not have regular meals (Jin et al., 2008).These findings are in congruence with the result of the present study as some of the participants affirm to have compromised their compliance due to forgetfulness.

10.1.21 Rejection

In the present study participants think that their friends could leave them if they knew about their disease, they are so worried about how their friends would react that they do not feel like disclosing it. Similar results were reported in a study conducted by Wdowik et al., 1997) among college student with diabetes. More so, these findings indicate the distress felt when patients disclosed their disease to their fiancés, actual experience a cancelation of an engagement because of the disease. However, t-his current study is in accord with the findings of Brashers et al., (2003) which social uncertainty stemming from the fear of rejection upon disclosure, were found to be unique to those living with HIV.

10.1.22 Access to Social Roles

In this study, diabetic patients expressed that the illness represents a major obstacle denying them access to important social roles. Mostly, the study found that the illness imposes barrier for the patient to be seen as inadequate and unfit in engaging in their usual social related roles. In a study conducted by Wellard et al., (2008) among adults with type 2 diabetes reported that patients feels embarrassed when they need to refuse unhealthy food options at social event. More so, this finding is in congruence with result of this present study as participant assumed that they will be quarried for refusing not to drink soft drink in their cultural group meeting. However, the analysis of the focus group also shows discrimination encountered by the participants as a consequence of diabetes.

10.1.23 Labeling

The result of this present study indicates that some of the participants felt they do not want to sit down outside the door of the diabetes ward and show their handicap. The findings of this study can be compared with William-Olsson’s text (1989 p.7), where she writes: “In their illness people with diabetes are both ill and well, which makes them want to hide their illness in order to be accepted on healthy people’s terms and not be questioned”. To be named a diabetic means to some of the study participants that they are handicapped and weak even if they feel healthy and strong. However, this explains why some of the participants do not want to sit outside the door of the diabetes wards and show their handicap.

10.1.24 Criticism

In this study people with diabetes feared to be criticized and reported to have received criticism from friends. They expresses restricting their social life for fear that people around them don't understand them and their problem. And moreover, this imposes an awkwardness of negative feeling for the patients. Similar observation was found in a study conducted by Broom & Whittaker, (2004) that fear of negative appraisal and criticism or judgments contribute to a reluctance to share openly with close family, friends, and health professionals about self-management activities. These authors suggested that people with diabetes may fear receiving negative feedback if they do not maintain optimal blood glucose levels, for which they are often held responsible. However, in a study conducted by Rasmussen et al., (2001) transitional changes caused stress about when to disclose diabetes and fear of judgment responses from people in social network. More so, Rasmussen et al., (2001) concluded that such situation affects or made adhering to diabetes management plans difficult specifically for young women with type 1 diabetes. Conversely, in this present study female patients' with type 1 diabetes expressed perceived criticism which is in congruence with the finding of Rasmussen et al., (2001). While the study of Shiu et al., (2003) supported this present study finding on the aspect of actual criticism such as embarrassment encountered by the patients for taking insulin injection amidst of friends.

10.1.25 Lack of Knowledge

Lack of knowledge/understanding of the condition has been reported among (DM) patients in 7 studies from four countries, including Cameroon, Kiawi et al., 2006; Malaysia, Al-Qazaz et al., 2011; Mohd and , Jusoff, 2009; the UK Brown et al., 2007; Choudhury et al., 2009; Peel et al., 2004; and the USA Coronado et al., 2004). The finding of this present study showed that lack of knowledge about the disease prevents participants in taking action promptly. More so their limited knowledge as regards to information needed for their illness induces concern for them. For instance limited knowledge was attributed to their unproductiveness and non-compliance. Similar observation was reported by Fernandez et al., (2011), in a study done among Appalachian population where participants from the general population and those with diabetes know very little of diabetes. In addition the study of Schram et al., (2009), conducted amongst ethnic majority group in the UK support this current study result, the authors suggested that people were not clear about the nature of diabetes or the importance diet played in its management. More so, other studies reported that patient's knowledge about their disease and treatment is not always adequate, as some that patients lack understanding of the role their therapies play in the treatment (Ponnusankar et al., 2004); other lack knowledge about the disease and consequences of poor compliance (Alm-Roijer et al., 2004; Gascon et al., 2004); or lack understanding of the value of clinic visits (Lawson et al., 2005). For these reasons, patient education is very important to enhance compliance. More so, counseling about medications is very useful in improving patient's compliance (Ponnusankar et al., 2004). Although, researchers e.g. Griffin et al., (1999); Norris et al., (2001) studies showed that increasing the knowledge of person with diabetes does not necessarily lead to enhanced diabetes self-management. Whereas, in another development Olubodun et al., (1990); Lindberg et al., (2001) recommended that healthcare providers should give patients enough education about the treatment and disease. However, the study of Hamburg & Inoff (1982) is in congruence with this present study giving that the authors reported "An inverted U" relationship between knowledge and compliance among Adolescent patients with diabetes stating that patients who know very little about their therapies and illness showed poor compliance, while patients who were adequately educated about their disease and drug regimens showed exceptionally compliance. In addition, a study conducted in Hong Kong by Chan and Molassiotis (1999) could not find any association between diabetes knowledge and compliance. The authors suggested that there was a gap between what the patients were taught and what they were actually doing, which contradicts with the findings of this current study as the participant voiced and attributed lack of knowledge for their non-compliance. In other hand participants who showed better compliance were more knowledgeable their diabetes.

10.1.26 Failed Expectation

In this study, patients described feeling a sense of personal failure when not achieving treatment goals and expresses guilt, frustration, or disappointment occasioned by failed expectations that they could never do enough to manage their diabetes successful. Evidence from different studies e.g. (Kralik et al., 2006; Rasmussen et al., 2007b, 2008; Kay et al., 2009) established a link between every day stressors and diabetes control which makes people with diabetes particularly vulnerable to a variety of expectations and reactions from others. Although, it is not clear whether the patients in this study set too high expectations for themselves? The sense of hopelessness expressed in this study is characterized by an increased vulnerability to constant struggles. More so, diabetes patients is said to be facing complex self-care prescriptions, including weight reduction, increased physical activity, diabetes nutrition guidelines, oral and/or insulin medication regimens, and frequent blood glucose monitoring. Studies have showed that these Behaviors are critically linked to improved glycaemic control (Conn et al., 2007; Karter et al. 2001; Pi-Sunyer et al.1999); however, patients often struggle to integrate these behaviors into their daily lives (Weinger K. 2007; Peyrot et al, 2005; Rubin 2001; Wdowik et al., 1997). In fact, Hoerger, (2008) reported that nearly one and half of diabetes patients have haemoglobin A1C levels above target. While other researcher's (e.g. Welch et al., 1997; Lloyd et al., 2005; Weinger and Jacobson. 2001; Albright et al., 2001; Gonzalez et al., 2008; Gonzalez et al. 2007; Gonzalez et al., 2008) have observed that patients frustration to meet recommended glycaemic and Behavioral goals may be reflected in new or existing emotional difficulties that further hamper patients' efforts to manage diabetes. Similarly, the difficulty in managing the complex tasks of diabetes may leave patients feeling defeated and depressed. Hence, it is imperative for physicians to understand patients' struggle to achieve treatment as they are well positioned to encourage and support patients who are not achieving treatment goals, which may help patients feel more motivated and empowered to integrate self-care recommendations into their lifestyle and feel less self-blame.

10.1.27 Dissatisfaction of Treatment Options

In a recent study conducted by Campbell et al., (2003), the authors called for a proactive approach to self-car**e** regulation for patient's treatment options as to enhance compliance. More so, Tattersall, (2002), argues that patients must have the freedom and with the approval from their providers to change their treatment, specifically patients with diabetes should feel empowered to make adjustment in their insulin dose to match their food choice. Similarly, this current study is in accord with the argument of Tattersall, whereby this current study participant voiced their wish for treatment options of which is out of reach. However, care providers failure to attend to the patient's perspective in terms of offering them treatment options after adequate evaluation may induced non-compliance and as such warrant a strong need for self-care regulation strategies as advocated by Campbell et al., (2003).

10.2 Chapter Summary

This chapter presented the findings from the second phase of this mixed study, which sought to explore why the psychological health of diabetic patients varied across gender, ethnicity and type of diabetes. This objective was achieved through the collection and analysis of qualitative data from semi-structured focus group interviews held with a sub-sample of the participants from study phase one. The findings from the qualitative analysis identified a number of explanatory factors perceived by the informants to underlie the variation observed in patient's psychological health across gender, ethnicity and type of diabetes as described in chapter 9.Rich descriptions of patient's experiences in every day contexts regarding enabling and non-enabling factors were framed from the expression of the focus group participants which explanations were drawn from the sub-themes within each of the main emergent themes which are: Adaptation and Self-management, Personal Impact, Worries about present and future, Medical System Frustration, Non-adherence, Interpersonal interaction and social isolation, Empowerment to Self-management, and Medication and regiment task.In the concluding chapter of this thesis, the key findings from the quantitative and qualitative phases of the study are drawn together and discussed in light of their quality and contribution to the wider literature.

CHAPTER ELEVEN
DISCUSSION AND CONCLUSION

11.0 Introduction: -Integration of Quantitative and Qualitative Phases

Diabetes presents a serious health challenge for a developing country like Nigeria because it is a significant cause of ill health and premature death. Diabetes is considered to be relatively unique as a long term condition due to treatment regimens being carried out largely through self-care. As such, people with diabetes influence the course of their health and wellness through their self-perception and misconception with regard to health beliefs. It is well recognized that diabetes is psychologically, behaviorally and economically demanding and these factors complicate optimal management of diabetes.

Socio-cognitive health is a composite notion focusing on the environmental factors that are external to the individual, and the internalcognitive processes which influence the individual interpretation of the social context (Moscowitz, 2005, p.3). This means that no social reality exists beyond that which we actively construct in our minds and it is this cognitive construction of social reality – our social cognition- that ultimately determines our behavior in social situations especially when faced with threatening condition such as diabetes. In this study I set out to elicit an understanding of factors associated with psychological health indicators in general, and whether or how the association differs across gender, ethnicity and type of diabetes and more specifically to provide explanations for how socio-cognitive and socio-demographic factors influences the psychological status of diabetic patients. This has been accomplished in the data chapters through the representation of the patients' perceptions as they responded to quantitative and qualitative enquiry. Additionally, a new idea was generated on how to intervene by boosting diabetic patient coping resources to maximize personal resourcefulness and promote optimal self-care and psychological health.

The literature review provided an overview of existing theories and models on socio-cognitive health related to the research topic. It also provided a synopsis of relevant literature on psychological health which supported the process of enquiry. The study began with a practice based insight hypothesis consistent with abductive reasoning. The research questions based on the hunch influenced the choice of mixed methods as a methodology that could support the enquiry. Mixed methods methodology allowed for a pragmatically structured research approach, utilizing abductive, intersubjective and transferability with its methodological approach. In particular, the use of both quantitative and qualitative methods ensured that perceptions of participants were comprehensively explored.

The last phase of analysis in this study involves combining or integrating the results obtained from quantitative (QUAN) and qualitative (Qual) components. As explained in the methodology chapter, the phase 1 QUAN findings were obtained from a statistical analysis of the completed questionnaires administered to the participants/patients (n=486). While the qual phase 2 finding were obtained from a focus group interview of (n=18), participants who took part in the quantitative phase 1 of the study. This chapter explains how the quantitative and qualitative findings were integrated. In this integration the terms ‘Patients’ issued more frequently rather than ‘the research participants’ in order to avoid confusion. There are few different methods to integrate findings from the QUAN and qual analysis. The technique in this study followed a suggestion from Caracelli and Greene (1993) in which both data types were consolidated or merged to create new data sets for further analysis. The combining process followed the step -by-step method created by Onwuegbuzie and Teddlie (2003) moving from data reduction to data integration. It was started byre-reading and re-examining the results from both the QUAN and Qaul analysis. Due to the amount of data obtained, this integration phase of the study selected specific findings that are more in congruence within the QUAN and qual findings as some adjustments were made in integrating the data and it was impossible to transfer all the quantitative findings or qualitative findings into this phase. Rather, as indicated in chapter 3 of this study the main focus of the phase 2 qual was based on a follow up explanatory model of identified results from the categories of QUAN research question 2 and 3.The QUAN findings were based on the multivariate analysis of variance MANOVA of the patient’s results from the open ended question, while the themes from patients' focus group interviews were coded with qual thematic analysis approach.

However, the integrations phase of the study involved linking the findings from the QUAN research Question 2 and 3 with that of the findings from the qual research question which seeks to understand the contextual explanatory factors perceived to have underlain the gender, ethnic and type of diabetes differences observed in the psychological status and socio-cognitive health of the participants in the quantitative phase 1 of the study. The mixing of method gives more priority however to the QUAN stance and this approach is in line with the *sequential explanatory mixed method* given that the qual phase 2 of the study was mainly to complement and explore the QUAN findings so as to reveal the in-depth experience, and a general picture of how diabetic patients struggle with their illness. More so, other extant literature was consulted in the integration phase to explore any parallel or divergence with the newly created findings from the conjunction of both the QUAN and qual results.

The description and interpretation presented in this thesis is inevitable limited. To the present samples and testing methods. The multiple interactions of gender, ethnicity and type of diabetes on psychological health, and the difficulties of maintaining diabetes self-management care makes a wholly definitive analysis elusive. It is important to acknowledge that the experience of others with diabetes as they live their life with the challenges of diabetes self-care may diverge from the description of the perceptions of participants in this study principally because everyone is unique, although similar perceptions may be held.

11.1 Overview of the Findings:

Many socio-cognitive and socio-demographic factors explored in this study were found to be important contributors to psychological health in either a positive or negative manner and in dynamic and complex ways. In particular the QUAN data identified that that gender, ethnicity and type of diabetes has a significant interaction effect on depression. Ethnicity and type of diabetes has a significant interaction effect on anxiety.

More so, the finding showed a significant interaction between gender and type of diabetes on insomnia. While ethnicity and type of diabetes has a significant effect on anxiety, insomnia, stress, depression, fatigue, quality of life, and life satisfaction and gender had a significant main effect in all the psychological health indicators except on anxiety.

Similarly, in terms of socio-cognitive health indicatorsthe finding shows that gender, ethnicity and type of diabetes has a significant interaction on self-efficacy, locus of control and religiosity, while ethnicity and type of diabetes had significant interaction on coping. Also, gender and type of diabetes has a significant interaction on religiosity and negative religiosity, while gender and ethnicity had non-significant interaction effect in all the socio-cognitive health indicators.

Furthermore, gender significantly had a main effect in each of socio-cognitive health indicators except on optimism. While, ethnicity had a significant main effect on self-esteem, social support, coping, self-efficacy, and religiosity. And type of diabetes significantly had a main effect in each of the socio cognitive health indicators.

In terms of the pattern of association of socio-demographic factors with psychological health indicators the QUAN data showed that: Being a type 2 diabetes Patients, with medium income, married, age bracket between 35-51 year old, civil servant, having a university degree, with duration of diabetic for 6 months and above, having 1-4 children was significantly associated with lower depression, stress, fatigue, mild anxiety, absence of insomnia and higher quality of life and life satisfaction. Patients who are member of protestant religious faith and who lived in town significantly reported mild anxiety, absence of insomnia, higher stress, and low level of depression, fatigue, lower quality of life and were dissatisfied with life. Patients who are Igbo significantly reported low depression stress and mild anxiety while patients who are Yoruba ethnic group significantly reported lower fatigue, absence of insomnia and were dissatisfied with life whereas patients who are of ‘Others’ ethnic groups significantly reported low quality of life. Female gender significantly reported higher stress and depression, mild anxiety sub-threshold of insomnia, lower in fatigue, quality of life and life satisfaction whereas their male counterparts significantly reported lower stress and depression, higher in fatigue, quality of life and life satisfaction. Many of these patterns were evident in both the QUAN and qual data. Important aspects of this overlap in the QUAN and qaul data especially in regard to the key research question of the study about gender, ethnicity and type of diabetes.

The variables below were combined because of their strong connection or link within the QUAN and the qual findings. In others words the linkage was based on the notion that linking constructs explains more of the relationship between gender, ethnicity and type of diabetes and address the key aims of the research question.

11.1.1 QUAN- (Quality of life and social support) ↔ qual sub-theme (bearing multiple responsibilities for self and others)

Of key importance to the aims of the study in regard to possible gender, ethnic and type of diabetes differences, the QUAN findings showed that gender, ethnic and type of diabetes has a significant effect on quality of life and social support. The qual component findings explain or complement the difference from the QUAN findings as one of the emergent sub-theme from the qual findings identified that bearing multiple responsibilities for self and others created a serious issue for female patients and those of “other” ethnic monitories. More so, the qual findings showed the difficulties female patients encounter in the attempt to balance competing needs for themselves and that of people around them induces stress and affects their ability to manage their diabetes in everyday life. Interestingly, these differences have been described in previous literature (Murphy et al., 1994; Carter-Edwards et al., 2004) showing that males are likely to have a family member who assists them with various aspects of their self-care regimen. In contrast, the self-care of females is negatively influenced by social role obligations, and this is especially true of certain ethnic monitories group like the Africa-America community, where females often bear a greater responsibility as the caregiver for the entire family. More so, predictably, such females also reported lower quality of life as well as encountering more impediments to the self –management of their diabetes. The finding of Murphy et al., (1994), and Carter-Edwards et al., (2004) are thus consistent with and help to explain the integration of QUAN and qual findings in the current study regarding gender and ethnicity issues affecting the link between Quality of life and social support/ bearing multiple responsibilities for self and others.

11.1.2 QUAN- (Anxiety and coping) ↔ qual sub-theme (fear of complication)

The finding from the QUAN study indicated that ethnicity and type of diabetes has a significant interaction on anxiety. Nevertheless, one of the qual data emergent- sub-theme fear of complication indicated a similar concern among type 1 and type 2female patients of different ethnicity: there was a dominant concern of the likelihood of complication across female patients, but not for their male counterparts.Similarly, the qual data showed thatfemaleparticipants of ‘Hausa’ and ‘Others’ ethnic groups with type 1and type 2 diabetes were of much concern in developing complications of diabetes that would affect other areas of their life and as such wondered whether, if this happens, what will be the possibility of continued acceptance by people. Hence, the qual finding explained in detail what seems to be a source of worry for the patients within this category that potentiate their anxiety as identified from the QUAN study finding. The qual finding emergent sub-theme of fear of complication is congruentwith the finding from the QUAN stance in which the study observed interaction between ethnicity and type of diabetes on anxiety. However, from the integration of the QUAN and qual study, this finding can be compared with the study of Pera, (2011) who used a descriptive, exploratory evaluation study in a public hospital in Barcelona, Spain and reported that most diabetic patients in their study showed concern about the chronic complication of diabetes. More so, that their concern was due to fear of vulnerability and lack of coping strategy that induces anxiety and, as such, became a harmful consequence of poor diabetes control.

11.1.3 QUAN- (health locus of control) ↔qual sub-theme (acceptance and integration)

The finding from the QUAN component indicated that gender significantly hada main effect on locus of control, Nonetheless, the qual finding complemented the result of QUAN finding when this were linked into the emergent sub-theme of acceptance and integration of diabetes illness with this acceptance being a core central issue among male patients with type 2 diabetes in the qual data. The male patients in particular embraced their condition and its management as part of their life in more positive terms by accepting the disease positively and expressed hope, searching for positive meaning and which, in turn enables them to get used to their illness. For instance, one of the male patients with type 2 diabetes expressed constant effort that stem from education received from the medical doctor which helped in the management of diabetes problem.

This finding among male participants of type 2 demonstrated how patients in thecategories of acceptance and integration see health, illness, control and management as predictive of outcome of lifestyle and as such they tend to be the ones who also take personal responsibility for their condition in adapting/making the necessary lifestyle choices such as healthy diet. This connection between the QUAN finding of patient health locus of control and the qual emergent sub-theme of acceptance and integration has given this present study a clearer picture of the need to ensure that diabetic patients are helped to accept and integrate their condition. Interestingly, a study conducted with the purpose to develop the multidimensional health locus of control among diabetic sample (Wallston et al., (1978) showed that acceptance of personal responsibility for most aspects of diabetes self-care was dominant issue consistent with the construct of internal locus of control, where an individual believes his or her own self-care Behavior determines or influences an outcome.

Additionally, Wallston et al., (1978) further explained that for the patientwho accepts responsibility of their health and believes positively thatthe outcome of their self-care action will influence such patient’s metabolic control. The finding of Wallston et al., (1978) is consitstent with and help to elucidate in thecombination of health locus of control and acceptance/integration from the current study QUAN and qual data.

11.1.4 QUAN- (health locus of control) ↔ (qual sub-theme self- failure to compliance)

As explained above the QUAN finding showed that gender and type of diabeteshad a significant main effect on health locus of control. From the qaul data the emergent sub-themes of ‘self-failuer to compliance’ showeda consistent link withthe result ofthe QUAN finding regarding themain effect of gender and type of diabetes on health locus of control as type 2 femalesand type 1 male and female patients expression showed a constant battle regarding the temptation of indulging into food that required them to have prohibition for. However, the qual finding is congruence with the QUAN result in regards to the main effect of gender, type of diabetes on locus of control which explains the issue of self-failure to compliance to be more prevailing for type 2 female and type 1 males and females patients as observed from the QUAN finding. In other words low health of control induced self failure to compliance for these groups of patients for not taking care of their diabetes.This finding is important for diabetic health-care professionals, highlighting the need for more support to help patients make appropriate lifestyle changes especially dietary choice. Interestingly, Schlenk & Hart (1984) noted in their study that health locus of control were associated with failure of compliance using the Multidimensional Health Locus of Control scales. However, the finding of Schlenk & Hart (1984) supported with and helps to explain the integration of the QUAN and qual finding in the current study regarding the main effect of gender and diabetes type affecting the link between health locus of control and self-failure and compliance.

11.1.5 QUAN- (depression) ↔ qual sub-theme (dissatisfaction with the treatment option and the impact on physical vocational work)

The QUAN findings showed that gender, ethnicity and type of diabetes hasa significant interaction on depression. Moreover, from the qual finding males with type 1 and females with type 2 diabetes of Hausa ethnic group and male with type 1 of Yourba ethnic group expresseddissatisfaction with the treatment available to them and wish for other treatment options out of their reach. Equally, males with type 2 of Yourba ethnic group and male with type 1 of Igbo ethnic group expressed more concern on the physical vocational work impact. In other words, from the qual finding the impact on physical vocational work was a realistic issue for male patients who are type 1 and type 2. Thus, the researcher was unable to determine this difference regarding the females in term of physical vocational impact as such further studies on this is encourage.

More so, male and female gender with type 1and type 2 and of Hausa and Yoruba expresses dissatisfactionwith the treatment option available to them. However, the qual sub-theme finding of dissatisfaction with treatment option is congruence with the interaction effect observed between gender, ethnicity and type of diabetes on depression from the QUAN data.

Nevertheless the current study generally supports the observation from the study of Schram, Bean and Pouwer (2009) that individual with diabetes who are depresssed are less satisfied with their treatment, more worried about the impact of diabetes in the future and above all, about the social and vocational impact of diabetes.

11.1.6 QUAN- (self-efficacy) ↔qual sub-theme (lack of knowledge and failed expectation)

The QUAN result revealed that gender, ethnicity and type of diabetes significantly had interaction on self-efficacy. From the emergent sub-themes of the qual data, showed that females with type 1 and 2 diabetes of different ethnicity expression‘lack of knowledge’ and ‘failed expectation’this complemented the interaction effect observed between gender, ethnicityand type of diabetes on self-efficacy from the QUAN study. In other words the eight emergent themes of empowerment to self-management from the qual datawhich lack of knowledge and failed expectation are sub-themes demonstrated the extent female’s with type 1 and 2 diabetes participants within different ethnic groups described the limited knowledge on their awareness of diabetes care and their failed expectations. However, this finding offer a practical implication for the diabetic health provider as people with diabetes need empowerment to best manage their condition to achieve optimal biomedical and psychosocial outcomes. Interestingly, Anderson and Funnell (2010) also explained that the person with diabetes who is empowered has a higher perceived self-efficacy, is actively engaged in their own health care (including self-care), and seeks out necessary support and information. And so, the current study supported the finding of Anderson and Funnell (2010) in terms of the QUAN and qual data linkage of self-efficacy and lack of knowledge.

11.1.7 QUAN- (Stress and self-efficacy) ↔qual sub-theme (insufficient time in consulting, appointment day frustration, and long waiting time).

The QUAN data analysis observed that gender, ethnicity and type of diabetes had a significant and main effect on stress and self-efficacy; similarly there was a significant interaction between gender, ethnicity and type of diabetes on self-efficacy. This findingis is in congruence with the qual datawhereby each of the sub-themes of medical system frustration*i.e. (Appointment day frustration; insufficient time in consulting and long waiting time)* complemented with the interaction effect observed between gender, ethnicity and type of diabetes. For instance, malepatients with type 1 diabetes of Igbo and Hausa ethnic groups and females with type 1 and type 2 diabetes of others and Igbo ethnic group strongly voiced their concerns in terms of the *appointment day frustration,* More so, insufficient time in consulting was a resource of concerns for females and males gender with type 1 and 2 diabetes who are of others ethnic group and same for females and males gender with type 1and type 2 of Igbo ethnic group. Similarly, females with type 1 and 2 diabetes of other ethnic group and male with type 1 of Igbo ethnic group were stressed in terms of the long waiting time.

Although, from the QUAN data the interaction effect between gender, ethnicity and type of diabetes characteristics were not the same for each of the sub-theme from the main emerged theme of medicial system frustration. Diabetes patientswithin these categories above was overburden with frustration on their appointment day, insufficient time in consulting with their Physican, and issue relating to long waiting time.

The qual finding was of utility in explaining why differences of stress and self-efficacy are obtained from the QUAN data. As females patient with type 1 and 2 and males with type 1 in each of this category was demotivated for seeing fellow patients with complication which generated for them apathy for life. This also explained the concept of *'modelling'* which is a self –efficacy technique by which the patient becomes aware of seeing someone else with a similar problem and evaluates their own caperability of handling or undergoing a particular situation. Thus, female patient with type 1 and 2 Type 1 and male with type 1 diabetes in this current study appear to have relinquished their endurance capabilities of handling stress generated during the cause of their self – care management. Therefore, the interaction between gender, ethnicity and type of diabetes on self-efficacy observed in the QUAN datacomplemented the qual finding that revealed the extentpatients struggled with un-adjustable long waiting time of appointment. Indeed, this wrestling with the length of waiting during appointment has been reported by various researchers (e.g. Grunebaum et al., 1996; Wai et al., 2005; and Moore et al., 2004) and this caused a great source of concern for the patients inducing stress which produces the idea of giving up treatment.

11.2 Overall Finding for both Quantitative and Qualitative study:

In the introductory chapter, despite the increasing prevalence of psychological burdens among people with diabetes and the impact of socio-cognitive factors on this disease, the lack of evidence on the socio-cognitive factors for the diabetes population in Nigeria context is clearly indicated by considering the evidence available prior to this PhD research. So the aims of the study were to answer the following questions:

Quantitative:

1. What is the pattern of psychological health as determined by diabetic patient's socio-demographic and socio-cognitive factors?

The aim of the research question 1 above seeks to assess the significant differences in pattern of psychological health of diabetic patients in regards to socio-cognitive factors and socio-demographic variables. The finding provided a satisfactory answer to the question in that patients with manageability sense of coherence, external locus of control, emotional focus-coping, and higher in self-esteem, self-efficacy, optimism, religiosity, social support, and lower negative religiosity significantly reported low stress, depression, mild anxiety, absence of insomnia and fatigue and higher quality of life and were satisfaction with life. While for the pattern for psychological health by socio-demographic factor showed that patients being a type 2 diabetes, with a medium income, married, age bracket between 35-51 year old, civil servant, having a university degree, with duration of diabetic for 6 months and above, having 1-4 children, significantly associated with lower depression, stress, fatigue, mild anxiety, absence of insomnia and higher quality of life and life satisfaction.

Furthermore, the finding revealed that patients who belong to protestant religious faith and who lived in town significantly reported mild anxiety, absence of insomnia, higher stress, and low level of depression, fatigue, lower quality of life and were dissatisfied with life. Also for ethnic groupings, patients of Igbo significantly reported low depression stress and mild anxiety while patients of Yoruba ethnic group significantly reported lower fatigue, absence of insomnia and were dissatisfaction with life but patients of 'Others' ethnic groups significantly reported low quality of life. And for the gender female patients significantly reported higher stress and depression, mild anxiety sub-threshold of insomnia, lower fatigue, quality of life and lower life satisfaction but their male counterparts significantly reported lower stress and depression, higher in fatigue, quality of life and life satisfaction.

2. To what extent may differences in psychological health (e.g., depression) among diabetic patients in Nigeria be explained by gender, ethnicity and type of diabetes?

   The aim of the research question 2 was to identify any significant differences in the psychological status among diabetic patients in Nigeria by gender, ethnicity and type of diabetes. And the findings provided a satisfactory answer to the question in that, gender, ethnicity and type of diabetes has a significant interaction on depression. While for ethnicity and type of diabetes the finding showed a significant interaction on anxiety. More so, the finding showed a significant interaction between gender and type of diabetes on insomnia. And finally, the finding showed that ethnicity and type of diabetes has a significant main effect on anxiety, insomnia, stress, depression, fatigue, quality of life, and life satisfaction, while gender has a significant main effect on insomnia, stress, depression, fatigue, quality of life, and life satisfaction.

3. To what extent may differences in socio-cognitive factors (e.g., self-efficacy) among diabetic patients in Nigeria be explained by gender, ethnicity and type of diabetes?

   The aim of the research question 3 was to identify any significant differences in the socio-cognitive factors among diabetic patients in Nigeria by gender, ethnicity and type of diabetes. The finding provided a satisfactory answer in addressing the question in that gender, ethnicity and type of diabetes has a significant interaction on self-efficacy, locus of control and religiosity, while ethnicity and type of diabetes had significant interaction on coping. Also, gender and type of diabetes has a significant interaction on religiosity and negative religiosity, while gender and ethnicity has a significant interaction effect on self-esteem and coping.

More so, gender significantly had main effect in each of socio-cognitive health indicators except on optimism. While, ethnicity had a significant main effect on self-esteem, social support, coping, self-efficacy, and religiosity. Type of diabetes significantly had main effect in each of socio-cognitive health indicators.

Qualitative:

1. What are the contextual explanatory factors perceived to have underlain the gender, ethnic and type of diabetes differences observed in the psychological status and socio-cognitive health of the participant in the quantitative phase 1 of the study?

   The aim of the qualitative research question is to explore the contextual and explanatory factors perceived to have underlain the gender and ethnic differences observed in psychological status and socio-cognitive factors. The finding provided was able to address the question in thattype 2 males' participants who are Igbo ethnic group were more adaptive to self-care management of their diabetes than the participants of Igbo (type 1 males and females), and (type 2 females) and participants of Hausa, Yoruba and patients of others ethnic groups. Another difference from the emergent themes was that of the personal impact, both gender within the two types of diabetes elaborated how they felt that diabetes impacted all aspects of their live, the frustration they usually encounter while seeking for treatment management, they also expressed worries about their diabetes at the present and in future time. Similarly, 'concerns about the present and the future' is a realistic issue for persons with type 1 and 2 diabetes among males and females participants except for participants who are type 2 males. Additionally, issues about non-compliance were a major concern for the participants in this present study as they voiced out their inability to adopt a healthy lifestyle. This study participant described how they face isolation from people around them, and reported intake of medicine and regimen as hard task. However, this was more dominant for the participants except for people with type 2 males. Conversely, female participants of type 1 and 2 felt the need for empowerment as to enable them manage their diabetes.

The present study findings showed the extent each of the research questions were answered satisfactorily and these findings were able to build upon the findings of previous investigation. The review of the literature has contributed to the knowledge of these issues by offering a comparison of the existing theories and models, of the study constructs, and how the existing models have influenced patients with diabetes. In addition to this, a review on relevant essential socio-cognitive and socio-demographic variables on how they are related with psychological health status of the diabetic patient has been offered. This thesis has also reviewed the methods used to conduct research in this field (in Pp. 146-166 & 210-218 the two main research approaches, (quantitative and qualitative), are clearly analysed by considering their philosophical dimensions. The epistemological assumption has clarified the selection and position of mixed methods to answer the research question. The present results from this combination of methods have contributed to the knowledge in this field, by clarifying the patients' views and experiences. One key general question for this study was the role of type of diabetes and gender in this area of enquiry. This study found that type of diabetes explains more of the variance than gender which, in turn, explains more of the variance than ethnicity. Thus, the qualitative data expanded and clarified the differences as observed between gender and type of diabetes which majority of type 1 males and females and type 2 female patients were less able to demonstrate competence in maintaining optimal expected lifestyles and Behavioral change or adjustment with diabetes. In contrast, type 2 male patients consider more that their self-management is essential and they should take more responsibility for their diabetes and health care, and as such their level of psychopathology is likely to be less.

Many of the socio-cognitive health seemed to contribute to the patients' outcomes as described in Chapter 7 (Pp. 146-166). These results generally support the findings from previous studies (e.g. Bluhm, 1984; and Sabri et al., 2014) which specified the relationship between socio-cognitive indicators and the psychological status of diabetic patients. In this study, many socio-cognitive health indicators are associated with the psychological response of the patients. More so, the study revealed specific areas in which diabetic patients struggle to achieve the optimal bio-psycho-Behavioral demands of the disease. Interestingly, this finding offers a clearer understanding for diabetic patients in Nigeria context. Moreover, the findings from the present study are similar to some of the extant literature reviewed across the developed worlds which are as follows:

In term of quantitative perspective, Talbot et al., (1999) reported that patient with low self-efficacy had higher depression than patients with higher self-efficacy. Also, Murawski et al., (1970) reported that patients with low self-esteem significantly reported high depression than patients with high self-esteem. Kaholokula et al., (2003); Osborn and Egede (2012) reported higher depression in patients with lower social support than those with higher social support. Ridder and Bensing (2002) found that patient with high optimism reported low depression than patients with low optimism. Kilbourne and Cummings (2009); and Kelly, Hertzan and Daniel (1997)found that patient who endorsed higher religious beliefs significantly reported low depression, low anxiety and stress than patients who endorsed low religious belief. Moreover, in term of quality of life, Sabri, et al., (2014) reported that patients with higher self-esteem had better quality of life than the patient with low self-esteem. Rose et al., (2004) reported that patients with higher self-efficacy had high quality of life than patient with low self-efficacy. More so, Carrillo et al., (2009); and Huang et al., (2010) found higher quality of life in patients with higher social support than patient with lower social support.

While from the qualitative perspective, Moonaghi et al. (2014) found that the diagnosis of diabetes offer participant an opportunity to improve their health.The finding of Sue et al., (2007) revealed that women expressed concern about the overwhelming economic cost of diabetes and its devastating complication. Glasgow et al., (1997); Petterson et al., (1998); Ward et al., (1997); Lignowska, (1989) found that men with diabetes experience less disease impact and more treatment satisfaction than women and that that women have multiple role responsibilities and may find the diabetes regimen difficult to fit into their busy live. Brashers et al., (2003); Carnett Martin et al., (2010); Mishel, (1990) found issues related to uncertainty in people with diabetes. Furthermore, Lerman, (2005) found issue of non-compliance that person with diabetes have difficulty with compliance of their regimen.

11.3 Contribution to Knowledge

Mixed methods methodology was well utilized in examining factors associated with differences in psychological health status of type 1 and 2 diabetes patients. The findings revealed a variety of socio-cognitive resources and socio-demographic factors associated with patient's psychological health. The quantitative data provided insights in terms of the relationships and differences between the constructs of interest, while the qualitative data expanded the findings by providing rich and full descriptions which were in consistent with the quantitative findings. However, the implications of the results are considered in three areas: implications for clinical application, implications for policy making and implication for Health Psychological Practice and service Delivery.

Implication for Clinical Application

Interestingly, the result of the combined DVs of psychological health indicators for research question two showed a significant interaction between gender, and ethnicity on psychological health, whereas the detailed analysis on each of the DVs of psychological health, found no significant interaction between gender and ethnicity on anxiety, insomnia, stress, depression, fatigue, quality of life and life satisfaction. Appropriately conducting research with ethnicity and gender may identify important characteristic to be useful in clinical practice. The finding of the current study is expected to generate more debate and several research opportunities. While these results add to the body of research on diabetic patients psychological health status and socio-cognitive health, the findings also calls for more research and interventional studies on diabetic related stress, depression, anxiety, insomnia and fatigue in addition to studying diabetes patients. Future clinical research may be broadened to include patient's parents, relatives and caregivers. This group may help to give some information retrospectively on diabetes impact and experiences as well as to benefit from research interventions within group discussion.

More so, from this study, it seems logically correct to state that long term condition care is necessarily multifaceted and required constant review and evaluation to enable integration of the identified outcomes. Therefore, future study would benefit from using qualitative method in the first phase to explore the subjective experiences of the patient and generate questionnaires for follow up in the quantitative phase with a large sample as to generalize results to the patient’s populations. Although, this suggested approach is in opposite direction with the current study method process, but it application in future study will enable specific constructs that is of more pertinent to patients to be first discovered using a qualitative phase before following up the results in the Quantitative phase.

Specifically, future research into the socio-cognitive effect of diabetes self-care management is warranted given the range of different pattern expressed by participants in the qualitative analysis. As these expressions were only illuminated through the use of qualitative methods in the current study, it is reasonable to suggest that this may be an important approach to investigate the true extent of socio-cognitive health of patient perception and misconception. It would be of particular interest for researchers across developing nations to explore further on specific results revealed in this study within the quantitative and qualitative findings as to validate the study outcome regarding participants’ rating of high psychopathology. Participants with a higher self-rated level of socio-cognitive health were linked and defined by adaptation of self-care management and such participants felt to be diabetic is an opportunity to improve their health. An investigation on the benefit finding on how health professionals could cultivate and support the development of positive emotion could be instrumental in improving patient socio-cognitive health and their psychological health outcomes overall. Participants described the difficulties in understanding recommendation from diabetic care provider. Further exploration of this attribute would be helpful to enable informative knowledge that will enhance patients’ adherence.

Implications for Policy Making

The outcome of this investigation provides information that can be utilized by the field of health psychological and health care management in charge of policy making in Nigeria on the prevalence of psychological illness and socio-cognitive risk factors. This will enable for appropriate formulation of specific intervention for psychological care, and generate forum whereby these findings will be deliberated between the researcher and members within diabetic care centres. This will also encourage the Ministry of Health in Nigeria in seeing the psychological needs of the diabetes patients and then employ health psychologist who can works with the endocrinologist and other health care provider and offers support that will boost psychological health of patients and enhances their motivation in engaging efficiently in every day self-care of their condition. In addition, it is anticipated that by adopting the recommendations from this study, the government and other health care givers in Nigeria within the diabetic care will save more money due to early intervention rather than waiting until the disease got into the stage of complications and causes death.

Implication for Health Psychological Practice and Service Delivery

The findings of this study have benefit for future practical application in educating patients by counselling and by therapy. The study also supports the effectiveness of socio-cognitive indicators external locus of control and self-efficacy as beneficial in the intervention of psychological health. The study provided evidence for a positive association between psychological health and measures of socio-cognitive factors especially self- efficacy and external locus of control. This finding has implication to health psychologists and therapists in motivating patients and in developing the skills that will enable the patients stand up to challenges, and consequently this will improve patients' self -care performance. Similarly, the externalization for controlling diabetes as showed from the finding of this study has an implication for the health care practices in the Nigeria context signifying dependence of the patients' on their health care professional which would be a basis to foster adherence. However, psychological care of diabetes patients in Nigeria would receive a boost in the service delivery if the health care experts (Health Psychologist) recognised that diabetes patients highly relied on their support to achieve optimal control, meaning that patients who received such perceived support will likely be in charge of diabetes self-care.

It is very clear from the participants' descriptions that living with and self-managing of diabetes can be extremely challenging. The relentless nature of diabetes self-care is demanding and can be overwhelming, and negatively impact on psychological health. It is also evident that health care systems and the way medical practitioners interact with people with diabetes has a degree of influence on psychological status which then compromised optimal diabetes self-care. The researcher believe this study can make a significant contribution to understanding how health care systems and their professionals can maximise the limited consulting time they have with people with diabetes who are left to self-care 95% of the time (Anderson et al., 1995). More so, there is already a substantial body of knowledge on the multiple barriers to good diabetes management, spanning the social determinants of health. Likewise, there is a considerable body of knowledge on the need for patient empowerment that is creating a patient-centred and collaborative approach to match the fundamental realities of diabetes care from the time of diagnosis in helping patient discover and develop the inherent capacity to be responsible for their own life. This study shows that in addition to diabetes specific expertise, the things that can support participants the most were issues based on operating principles of health care systems such as the educational information. One has to ask the question why that is so hard to implement in practice. Although the self-care regimen is complex, patients with good diabetes self-care Behaviors can attain excellent control. However, many patients do not achieve good control and continue to suffer other health related problems. More so, diabetes health care providers know that if only their patients adhered to their treatment recommendations, they could do well and avoid diabetes-related complications. The fact that so many patients do not can be very frustrating.

Research has demonstrated that increased patient-centred Behavior by physicians leads to greater compliance in patients' at-home medical care, such as taking pills (Stewart, 1984). This thesis provides insight and more understanding as to why non-adherence occurs. Similarly, a substantial literature has documented a number of factors related to diabetes non- adherence problems (Delamater et al., 2001). However, this study identified the importance of patient centred care as an interconnected aspect that could improve adherence and boost psychological health status of diabetic patients. Consequently, these factors such as the socio-demographic, psychological, socio cognitive factors, as well as health care provider, medical systems, and disease- and treatment-related factors were linked together to form a different new pathway, and is called the 'Pathway Collaboration Model' (PCM).

Consequently, prior to this study, there was no singular model or structural design showing the pathway within which the psychological, socio-cognitive, Health Behavioral outcomes and health care system management intersect within diabetes care. However, the results from this study give a new evidence of the stages and scope of patient responsibilities to self-care and the primary principles of health care professionals. The integration of the findings from the qualitative and quantitative data highlights the need for collaboration between health care provider and diabetic patient to achieve optimal diabetes care. An essential pathway for this collaboration is proposed and described in figure (11.1).The central theme in the pathway collaboration model is that it shows the process by which diabetic patients can achieve optimal Bio-psycho-Behavioral management of their condition which required an intersect between the patients factors and Health care system/care providers factors

The Pathway Collaboration Model (PCM) is an integration of the major variables selected in the quantitative study and the once that emerged from the focus group theme. In other words the major constructs of the PCM was identified from the current study: (a) Clinical/socio-demographic characteristics, (b) Medical system/ providers management of the illness and(c) Patients socio-cognitive resources.

The implied dynamics between these constructs is that patients are constantly confronted with stimuli which are either clinical or socio-demographic characteristics and that does affect the medical system management of the illness which in turns, influence the socio-cognitive resources of adaptation of the illness and this elicit positive or negative response which represent good or poor psychological health. However, below is the description that explains the link within the constructs of Pathway Collaboration Model (PCM):

- The pathway collaboration model demonstrates the stimuli that confront patients with diabetes or the contributing factors of socio-demographic characteristic such as ethnic identification, education, economic status, number of children and employment history. This whole of factors disproportionately affects vulnerable diabetic populations such as women and patient living in rural areas as they are relatively few health care resources which are barriers to the patients. Establishing and maintaining support for these categories of patients does foster their management of diabetes while failure to this do elicit to poor psychological health.

- The empowerment for self-management of diabetes is dependent on the influence of the medical system factors as helping patients to optimally self-manage their illness requires teaching and empowering them how to seek and use their socio-cognitive resources.
- Also for the adaptive of diabetes is, to a considerable extent, dependent on the socio-cognitive factors and for the effectiveness of good psychological health and patients who do self-manage their diabetes successfully, it is likely that their quality of life will be enhanced.

This model makes a clear contribution by stressing the complexity of factors for understanding the experience and views of those with diabetes and the management of their condition. The current thesis makes a clear case for this model not only from the current data, but also by examining the evidence from other studies that also identify the complexity of living with diabetes and the challenges the suffers encounter when consulting the healthcare system. These results have expanded our understanding that achieving diabetic optimal psychological health and self-care management must crucially; involve collaboration between the healthcare team and the patients.

Furthermore, in relation to all the major aspects of the models adopted, the current study findings relates with some of the key issues in those models. For instance, one of the current study results indicated that people who embraced their condition and its managements as part of their life in more positive terms by accepting the disease positively and expressed hope, searching for positive meaning were able to get used to their illness. Similarly, this current study finding is consistent with the explanation stated in the social cognitive transitional model of (Brennan 2001) whereby Brennan opined that some people appear to be more adapting at negotiating the dramatic changes forced upon them when struck by illness, and undergo a positive transformation characterised by a sense of personal growth. However, the social cognitive transitional model which focuses on personal control and re-appraising the meaning of control to accommodate distress and foster change at intra-psychic and interpersonal level is consistent with the finding of the current study.

In another development, this current study identified other potential factors such as medical systems, and disease-and treatment-related factors, and adherence of diabetes regimen as mediating factors on the psychological health outcome which were absent across the models. Furthermore, it became more apparent to suggest a new pathway via amalgamating the models' core factors to establish the relationship between the socio-psycho-Behavioral and health care management system factors as identified from the qualitative findings rather than the singular models adopted in chapter 1 of this thesis, more so, this new suggested pathway is illustrated in figure (11.1). Despite the core variables, as explained in those different models, that were adopted for this thesis, it remains elusive and do not explain other outcomes and general experience encountered for long term conditions (diabetes) as the patients continues to suffer from the 'tyranny of the urgent' Bodenheimer (Wagner et al., 2002). Furthermore, this study has illuminated the pathway by which diabetic patients can be helped via the suggested relationship between the contributing factors with which diabetic patients struggle. These respective and complementary understandings should be incorporated in the delivery of diabetes care.

Interestingly, results from various studies supported the specific core factors as identified in the new suggested pathway which is discussed below according to each of the factors and their related outcomes. In addition, the suggested pathway warrants further empirical investigation for the validation of those core factors.

Socio-cognitive factors

Psychological health is closely linked with regimen adherence. Socio-cognitive factors were found in this study to impact on psychological health (see chapter 6 . Pp.167-193). Appropriate health beliefs, such as perceived seriousness of diabetes, vulnerability to complications, and the efficacy of treatment, can predict better adherence (Brownlee-Duffeck et al., 1987). Patients adhere well when the treatment regimen makes sense to them, when it seems effective, when they believe the benefits exceed the costs, when they feel they have the ability to succeed at the regimen, and when their environment supports regimen-related Behaviors. In summary, evidence from the integration of quantitative and qualitative phase showed that there is an association between adherence and patient socio-cognitive health indicators.

Psychological Factors

Higher levels of stress and mal-adaptive coping have been associated with more adherence problems (Peyrot, McMurry, and Kruger 1999). Psychological problems such as anxiety, and depression, have also been linked with poor diabetes management in both youths and adults with diabetes (Delamater et al., 2001). The recent DAWN study showed that a significant number of diabetic patients have poor psychological well-being and that providers reported that these psychological problems adversely affected regimen adherence (Peyrot et al., 2005). The integration of quantitative and qualitative phase in this study showed that the adherence and psychological have a bio-directional relationship.

Socio-demographic factors

The contributing factors within the socio-demographic characteristic showed that ethnic identification, education, economic status, number of children and employment does confront patients with diabetes and affects adherence and their psychological health. The study of Sweileh et al., (2014) showed that low educational level, having no current job, and low medication adherence was significantly associated with high depression. While Rivero-Santana et al., (2013) found that diabetic patient of majority ethnic group were more likely to adhere to treatment of compliance than the minority ethnic group patients. The present study also observed an association of various socio-demographic factors with adherence and psychological health.

Health Care Provider and Medical System Factors

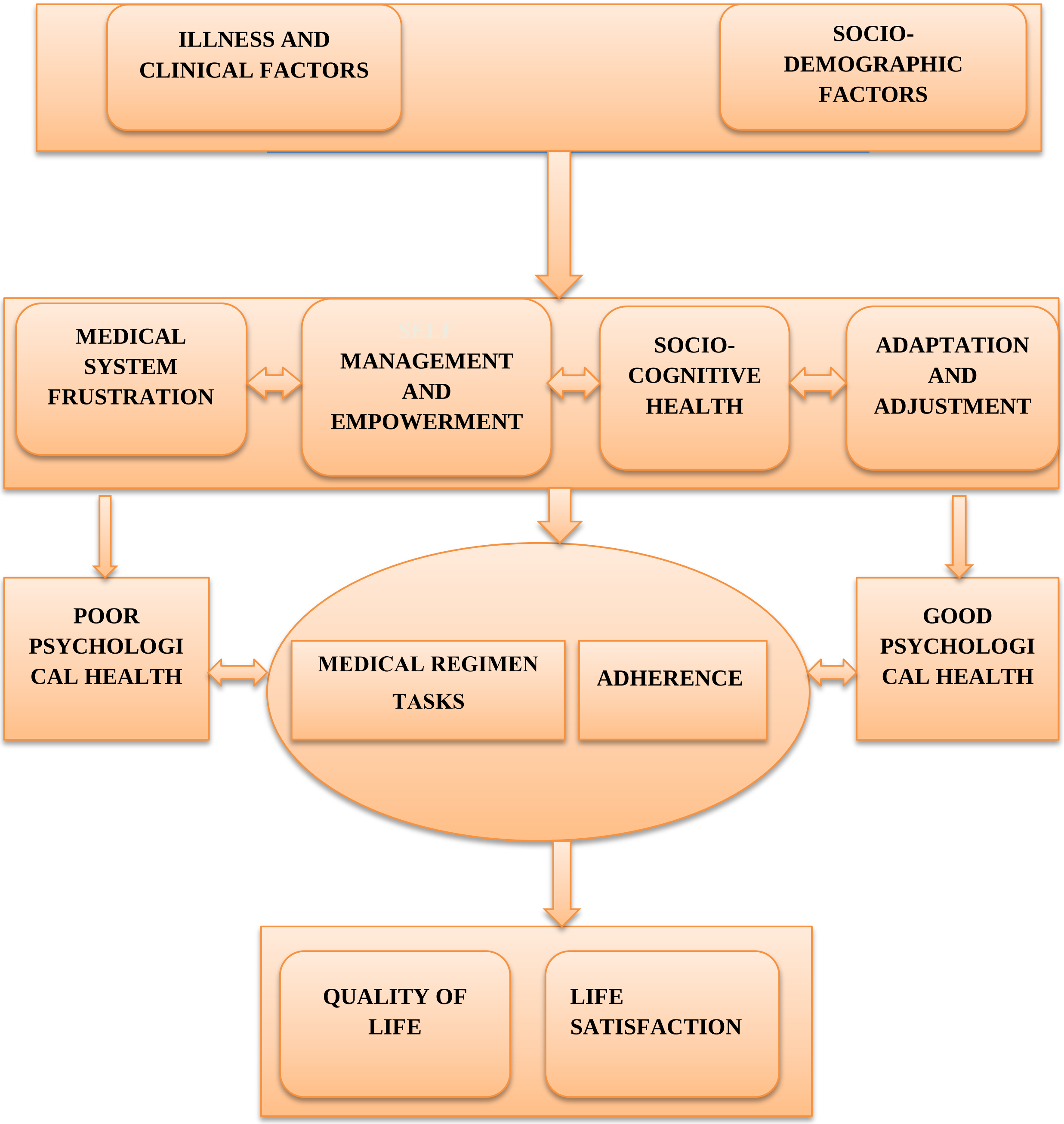
Social support provided by nurse case managers has been shown to promote adherence of diabetic patients to diet, medications, SMBG, and weight loss (Sherbourne et al., 1992). Another study showed that having regular, frequent contact with patients by telephone promoted regimen adherence and achieved improvements in glycaemic control, as well as in lipid and blood pressure levels (Aubert et al., 1998). It was observed in the Diabetes Control and Complications Trial that one of the key elements to success in achieving good glycaemic control was the availability of support provided to patients by the health care team (DCCT Research Group: (1995). In addition to ability to obtain support from health care team members, the quality of the patient-doctor relationship is a very important determinant of regimen adherence.

Research has demonstrated that patients who are satisfied with their relationship with their health care providers have better adherence to diabetes regimens (Von et al., 1997). In addition, patients who have a “dismissing attachment” style (discomfort trusting others (negative view of others) and therefore greater self-reliance (positive view of self) toward their doctor and who rate their patient-provider communication as poor have been shown to have lower adherence rates to oral medications and SMBG (Ciechanowski et al.,2001). Organizational factors that promote adherence include reminder post cards and phone calls about upcoming patient appointments and appointments that begin on time (Haynes, Taylor, and Sackett1979). Similarly, the present study found that patients who perceived to be frustrated with the health care system had poor psychological health and adherence problems.

Disease-and Treatment-related Factors

Research has generally shown that lower regimen adherence can be expected when a health condition is chronic, when the course of symptoms varies or when symptoms are not apparent, when a regimen is more complex, and when a treatment regimen requires lifestyle changes (Haynes, Taylor, and Sackett1979). Studies have shown that diabetic patients indicate better adherence to medications than to prescribed lifestyle changes (Anderson, Fitzgerald, and Oh 1993), and better adherence to simpler regimens than to more complex ones Ary, et al., 1996). The present study found that patients who use insulin had adherence problem due to the insulin regime which were tasking and making it more complex for them to handle.

Figure11.1: Pathway Between Socio-demographic Factors and Patient Socio-cognitive Coping Resources and Health care Institution Factor with Health Behaviour and Psychological Health.



11.3 The Strength of the Study

Evidences from extant literature revealed that most previous studies that had examined diabetic patient's psychological health and socio-cognitive factors were based on one or two variables, and with small sample size (e.g. Adejoh 2012; Agbir et al., 2010). Others also used non-probability techniques i.e., convenience samples rather than a probability technique stratified sampling of all diabetic patients within the study population that meet the inclusion criterion. Consequently, the application of the findings from such studies for evidence-based practice is limited, because the generalization of the results is limited. The present study improved upon the limitations of the previous studies in the following areas: sample size, range of variables, objective and subjective measures, the use of validated measures and mixing quantitative and qualitative methods.

Sample Size

The present study employed a large sample (n=486) compared to studies found in the literature that examine diabetic patients psychological status and socio-cognitive response. The large sample in the current study enabled the various statistical analyses to be carried out. Researchers agree that a scientifically valid sample of sufficient size is important to detect small to medium sized effects (Cohen 1992; Dowdall and Weichsler 2003).

Range of Variables

Since the present study investigated psychological health status, socio-cognitive and socio-demographic factors of diabetic patients, it employed numerous variables that are reported in the literature in the study of diabetes patients' psychological health status, socio-cognitive factors and socio-demographic factors. In addition, variables selected for inclusion in the current study weres also based on the factors mentioned in the health models discussed in chapter 2 of the present study. As discussed in chapter 1, employing such a wide range of potentially related variables from the health models is an advantage of the current study since it allows for the identification of more complex interactions than would be possible in studies using fewer variables.

Objective and Subjective Measures

Previous studies were limited by recall and selective response biases, which questions the generalizability of such studies (Kyrios et al., 2006). The current study employed self-reported measures (objective) and then explored the sub-objective experiences of the patients. The present study has the advantage of this dual approach, since limited study was found in past literature that combined both approaches and such measurements in diabetes study in Nigeria.

Use of Validated Items

Another Aadvantage of the present study is the use of validated items (e.g. HRQoL, PSS and BDI) that are commonly used in the study of diabetic population. The results of the present study can be compared with similar studies across the world. In addition, using validated popular items can enable the current study to be repeated or reproduced by another researcher in Nigeria or elsewhere.

11.4 Reflections on Methodology

Mixed methods methodology, an approach to knowledge derived from theory and practice, is commonly patterned with a pragmatic approach, and attempts to take into account, multiple stances, perspectives, positions and research approaches (Johnson, 2008). Mixed methods methodology has been utilized in this study to seek complementary data (to provide elaboration, enhancement, illustration and clarification); and expansion of data (to expand breadth and range of inquiry by using different inquiry methods for different inquiry components).This study has clearly evinced the value of a mixed methods methodological approach in exploring the complexities of psychological health behaviors. It has broadened the repertoire of different methodologies for studying diabetes issues and increased the range of methods of understanding psychological health in diabetes in ways that account for inherent subjectivity (Brannon, 2005; Thorne, 1993). The data obtained from the structured questionnaire provided data for statistical analysis to assist with answering the research questions through the utilization of the disproportionate stratified sampling scheme. That is, every person in the desired population had an equal and independent chance of being chosen as they were drawn from each stratum (ethnicity) where a random selection was made so as to have the total sample needed in this study (Collins et al., 2007). This information has complemented and added to what is currently known about psychological health. In particular, it has generated knowledge about these constructs specifically into the context of Nigeria.Qualitative data obtained through focus group interviews of a smaller number of purposely selected participants enabled the collection of rich context-laden data. The strength of using mixed methods is in the understanding of multiple contextual factors influencing patients' psychological responses. Its use in this study has revealed "potentially silenced voices or perspectives" (Boyatzis, 1998, p .30) to be brought forward and acknowledged.

Furthermore, throughout the research process, data and the evolving analysis has been shared in scholarly dialogue with supervisors, and expert colleagues. The diverse ways the data has been analyzed were described in chapter 6 & 9. More so, throughout the research process, the researcher attempted to acknowledge and take into account the inherent subjectivity in how the data has been analyzed, interpreted and reported. Premium was also placed on how the reseacher's position as a clinician may influence participants' responses. Developing explanations for influences on psychological health indicators has been the main aim of this thesis. Both the quantitative and qualitative data contribute to the explanations presented in the study.

As already known, individual experiences are rather more "unique and mysterious than statistical norms suggest" (Thorne, 1993, p. 5). The level of understanding about individual perspectives gained in this study would not have been possible without a mixed methods approach to research.

Ethical issues were of prime consideration in the conduct of this study as patients confidentiality was fully protected by ensuring that all the records that contain patients names and other identifying information were kept in closed, locked files; and there was total restriction in accessing any of the electronic databases to other people except for the designated supervisory teams for this thesis. There was a careful protection on the computer used, as it was pass worded, and the code was never given to unauthorized persons. Also, the printouts of electronic information were kept in a restricted or locked area; printouts that are no longer needed were destroyed. Most importantly, obtaining the ethical approvals from the Ethics and Research committees (ERCs) were challenging.

11.5 Rigour in Mixed Methods Methodology

Ouwuegbuzie and Johnson (2006) provided a typology of legitimation for studies utilizing mixed methods methodology. This typology which included a number of strategies to ensure legitimation (or validation) criteria were met for the study and was consistent with the methodology discussed in chapter 4. . In describing the study patient's perceptions, the reasearcher used the words of samples as exemplars to demonstrate the individuality of the experiences while also illuminating the universal meanings of their perception in the thematic description. Individual patient transcripts informed the understanding of the individual experiences, their priorities in life and with diabetes, continuing engagement in their social world, and together as a body of data the overall analysis was informed by all patients' transcripts.

Furthermore, the validity, reliability and credibility of the description and interpretation were checked with the researcher's supervisors, other research expertise at the University of Gloucestershire and a practising Medical Doctor at the endocrinology unit at the university of Benin teaching hospital Nigeria. More so, the influence of my supervisors' thought and contribution were considered and my emotional responses to participants' description and how this may shape my interpretation of their account. However, the discussion with the expertise and that of the endocrinologist in diabetes care and other long term conditions had verified my interpretation.

The details regarding the process of statistical analysis of quantitative data and thematic analysis of qualitative data and writing has been provided for the purpose of auditability. For the quantitative data, this involved ensuring that the validity of measures are utilized, on the other hand, the qualitative data involved engaging with the data as words on a tap, transcribing verbatim importing into NVivo software and then coding.

Final interpretations have been made on the basis of findings from both quantitative and qualitative data analyses thereby meeting inquiry purpose of providing complementarity and expansion. Furthermore, the findings of the study sufficiently answered the research key questions by providing a significant interaction and main effect between gender, ethnicity and type of diabetes on psychological and socio-cognitive health indicators.

11.6 Limitation of the Study

Every study should be open to critique and the nature of that critique is usually informed by the ontological and epistemological assumptions for the study. One critique may address the utilization of mixed methods methodology, while the other may be the utilization of qualitive or quantitative method. However, as discussed in the methodology chapter, rather than dichotomising the world, the tensions produced by the two opposing poles (i.e., quantitative and qualitative methods) have been adequately examined. The mixed method methodological approach, with its methodological pluralism (Johnson & Onwuegbuzie, 2004), fits conformably within the philosophy of the discipline of health psychology and other disciplines within health and is considered to be justified in this study on "pragmatic rather than ideological grounds, to help researchers to engage with the complexity of health, health care and the environment in which studies take place" O' Cathians, 2009, p. 4).

Throughout the process, the validity and reliability of the study measures were maintained (Creswell and Plano Clark, 2011; Creswell, 2012). However, this study has some limitations which particularly related to some aspects of data analysis and integration. As the integration of the quantitative and qualitative findings was complex due to the number of themes and variables involved, this integration has produced comprehensive findings but each approach has its strengths and weaknesses. The quantitative methods used validated scales as noted above, nevertheless patients may not have responded truthfully on the scales. Likewise, the qualitative analysis followed a systematic course and the scope for interpretative error was therefore reduced but nonetheless, findings might have been different if the analyses were conducted by other researchers with different assumptions and views and there may be some issues regarding whether patients responded exactly as they felt. For example, the males replied in a more self-assured way than they really felt. Interestingly, evidence from the literature showed that male gender is perceived to be strong and tough while female gender is soft and weak (Oakley 1980; Oyewumi, 2002; Germov, 2010 cited in Ngum 2012). Similarly, Ezeah, (2004) reported that gender determines production and social relations and that most productive resources are controlled by the men and this in turn affect health disparities between men and women.

11.8 Concluding Statements

This study set out to contribute to the understanding of factors associated with differences of psychological health status of people with diabetes. An additional objective of the study was to explore the contextual and explanatory factors perceived to have underlain the gender, ethnic and type of diabetes differences observed in psychological status and socio-cognitive health. The study key aims and hypothesis below have being satisfactorily actualized:

- The first aim of the study was to assess the significant differences in pattern of psychological health of diabetic patient’s socio-demographic variables and socio-cognitive factors.
- The second aim was to identify significant differences in the psychological status among diabetic patients in Nigeria by gender, ethnicity and type of diabetes.
- The third aim was to identify significant differences in the socio-cognitive factors among diabetic patients in Nigeria by gender, ethnicity and type of diabetes.

In the discussion of the findings of this study, proper interpretation and understanding are achieved. This makes the study informative in terms of diabetic patients’ psychological health. These findings provide baseline information to the multidisciplinary team care for people with diabetes. Similarly, the potential influence of socio-cognitive and socio-demographic factors on psychological health status explored in this study acknowledges the complexity of psychological health Behavior in the delivery of care. Understanding the complex and dynamic nature of individuals’ responses to the challenges of diabetes in day-to -day self-care management can expand the compassion of those providing diabetes cares.

The outcome of this study will continue to extend knowledge on how best to support people with diabetes in promoting adherence, treatment processes, providing assistance to the physical discomfort associated with diabetes, and support pro-diabetes coping Behaviors (diet), manage psychopathology, especially anxiety and depression.

Furthermore, since diabetes affects every aspect of human functioning, it requires skilled and well-structured multidisciplinary workforce. Additionally, this study emphasises the need for a functional multidisciplinary diabetes health care to support the patients on diabetes related burden, as well as lifestyle changes which demand on the fortitude and motivation of the sufferers. Although, it is clear from this study that people with diabetes vary in their socio-cognitive responses, the critical importance of such responses to diabetes care has been highlighted by the findings in the study.

Furthermore, the growth of the psychological burden of diabetes incidence will continue to challenge the health care system unless a complex plan to assist patients in the management of their illness is reinforced by rigorously complementary treatment. For instance, the psychologist can support diabetics in adhering to regimen and help in coping with maladaptive responses to stress.

Interestingly, the field of health psychology per se, are practically and philosophically committed to functional wellness in the context of chronic illness. Nevertheless in Nigeria health care system, health psychology is rarely practiced as compared to larger primary health care, and as such the findings from this study offer a basis and an opportunity, within the general practice, to develop the required attention to the complex psychological health of those with diabetes.

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APPENDICES

APPENDIX A

UNIVERSITY OF
GLOUCESTERSHIRE

QUESTIONNAIRE FOR HEALTH RESEARCH IN NIGERIA

The researcher is interested in your experience as a patient who lives with and takes care of your diabetes. The information you provide will be used to help improve the care provided to people with diabetes in the future.

To take part all you need to do is:

Fill in the questionnaire by ticking or circling your response to each statement.

Thank you in anticipation

Onyekachi.P. David

Principal Investigator/PhD Student- University of Gloucestershire

About you

The questions about you will help the researcher to better understand and interpret the results.

How old are you? ________________________

What is your gender? Male ☐Female☐

What is your ethnic group?
Hausa/Fulani ☐Yoruba ☐Igbo/Ibo ☐Other, Please state______________________

What type of diabetes do you have?
☐ Type 1 ☐ Type 2
(treated with tablets first and then insulin)

How long have you had diabetes? _________________________

What is your overall monthly income?
Less <₦5,000☐₦5,000– ₦25,000 ☐₦25,000–₦45,000☐₦45,000– ₦65,000☐
₦65,000– #85,000 ☐₦85,000– ₦105,000 ☐₦105,000–above☐

What is your marital status?
Single☐ Married☐ Separated ☐ Divorced ☐ Widowed ☐

What is the level of your education?
No formal education☐Primary education☐ secondary education☐ University education ☐

What is your Nationality? Nigeria ☐ Others ☐

Where do you live?
Village☐ Town☐

How many children do you have? __________________

What is your religion?
RomanCatholic☐ Islam☐Protestant☐Orthodox☐ None☐ Others, please state_____

What is your Occupation?
Unemployed ☐ Civil Servants☐ self-employed☐ Student☐ Others, please state________

GAD-7 SCALE

Over the last 2 weeks, how often have you been bothered by the following problems? Please cycle the number that best describe your answer.	**Not at all sure**	**Several days**	**Over half the days**	**Nearly every day**
1. Feeling nervous, anxious, or on edge	**0**	**1**	**2**	**3**
2. Not being able to stop or control worrying	**0**	**1**	**2**	**3**
3. Worrying too much about different things	**0**	**1**	**2**	**3**
4. Trouble relaxing	**0**	**1**	**2**	**3**
5. Being so restless that it's hard to sit still	**0**	**1**	**2**	**3**
6. Becoming easily annoyed or irritable	**0**	**1**	**2**	**3**
7. Feeling afraid as if something awful might happen	**0**	**1**	**2**	**3**

ISI SCALE

For each question, please *CIRCLE*the number that best describes your answer.Please rate the*CURRENT (i.e. LAST 2 WEEKS) SEVERITY* of your insomnia problem(s).

Insomnia problem	None	Mild	Moderate	Severe	Very severe
1. Difficulty falling asleep	0	1	2	3	4
2. Difficulty staying asleep	0	1	2	3	4
3. Problem waking up too early	0	1	2	3	4

4. How SATISFIED/DISSATISFIED are you with your CURRENT sleep pattern?

Very Satisfied	Satisfied	Moderately Satisfied	Dissatisfied	Very Dissatisfied
0	1	2	3	4

5. How NOTICEABLE to others do you think your sleep problem is in terms of impairing the quality of your life?

Not at all Noticeable	A Little	Somewhat	Much	Very Much Noticeable
0	1	2	3	4

6. How WORRIED/DISTRESSED are you about your current sleep problem?

Not at all Worried	A Little	Somewhat	Much	Very Much Worried
0	1	2	3	4

7. To what extent do you consider your sleep problem to INTERFERE with your daily functioning (e.g. daytime fatigue, mood, ability to function at work/daily chores, concentration, memory, mood, etc.) CURRENTLY?

Not at all	A Little	Somewhat	Much	Very Much Interfering
0	1	2	3	4

PSS SCALE

The questions in this scale ask you about your feelings and thoughts during THE LAST MONTH. In each case, you will be asked to circle one response that describes HOW OFTEN you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

		Never 0	**Almost Never** 1	**Sometimes** 2	**Fairly Often** 3	**Very Often** 4
1	In the last month, how often have you been upset because of something that happened unexpectedly?	**0**	**1**	**2**	**3**	**4**
2	In the last month, how often have you felt that you were unable to control the important things in your life?	**0**	**1**	**2**	**3**	**4**
3	In the last month, how often have you felt nervous and "stressed"?	**0**	**1**	**2**	**3**	**4**
4	In the last month, how often have you felt confident about your ability to handle your personal problems?	**0**	**1**	**2**	**3**	**4**
5	In the last month, how often have you felt that things were going your way?	**0**	**1**	**2**	**3**	**4**
6	In the last month, how often have you found that you could not cope with all the things that you had to do?	**0**	**1**	**2**	**3**	**4**
7	In the last month, how often have you been able to control irritations in your life?	**0**	**1**	**2**	**3**	**4**
8	In the last month, how often have you felt that you were on top of things?	**0**	**1**	**2**	**3**	**4**
9	In the last month, how often have you been angered because of things that were outside of your control?	**0**	**1**	**2**	**3**	**4**
10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	**0**	**1**	**2**	**3**	**4**

M-BDI (20 items)
Please indicate how frequent you have experience each of the following statements in the last 4 weeks with the two extreme categories labelled as (**0= 'Never', to 5= 'Almost Always').**

		Never **0**	**1**	**2**	**3**	**4**	**Almost Always** **5**
1	**I feel sad much of the time**	**0**	**1**	**2**	**3**	**4**	**5**
2	**I feel my future is hopeless and will only get worse**	**0**	**1**	**2**	**3**	**4**	**5**
3	**I feel I am a total failure as a person**	**0**	**1**	**2**	**3**	**4**	**5**
4	**I can't get any pleasure from the things I used to enjoy**	**0**	**1**	**2**	**3**	**4**	**5**
5	**I feel guilty over many things I have done or should have done**	**0**	**1**	**2**	**3**	**4**	**5**
6	**I feel I am being punished**	**0**	**1**	**2**	**3**	**4**	**5**
7	**I am disappointed in myself**	**0**	**1**	**2**	**3**	**4**	**5**
8	**I blame myself for everything bad that happens**	**0**	**1**	**2**	**3**	**4**	**5**
9	**I would like to kill myself**	**0**	**1**	**2**	**3**	**4**	**5**
10	**I cry over every little things**	**0**	**1**	**2**	**3**	**4**	**5**
11	**I am so restless or agitated that it's hard to stay still**	**0**	**1**	**2**	**3**	**4**	**5**
12	**it's hard to get interested in anything**	**0**	**1**	**2**	**3**	**4**	**5**
13	**I have much greater difficulty in making decisions than I used to**	**0**	**1**	**2**	**3**	**4**	**5**
14	**I feel more as worthwhile as compared to other people**	**0**	**1**	**2**	**3**	**4**	**5**
15	**I don't have enough energy to do very much**	**0**	**1**	**2**	**3**	**4**	**5**
16	**I sleep a lot less than usual**	**0**	**1**	**2**	**3**	**4**	**5**
17	**I am much more irritable than usual**	**0**	**1**	**2**	**3**	**4**	**5**
18	**My appetite is much less than usual**	**0**	**1**	**2**	**3**	**4**	**5**
19	**I am too tired or fatigued to do a lot of the things I use to do**	**0**	**1**	**2**	**3**	**4**	**5**
20	**I have lost interest in sex completely**	**0**	**1**	**2**	**3**	**4**	**5**

(FAS) SCALE

The following ten statements refer to how you usually feel. Per statement you can choose one out of five answer categories, varying from **Never** to **Always.**
Please circle the answer to each question that is applicable to you. Please give an answer to each question, even if you do not have any complaints at the moment.

1 = Never, 2 = Sometimes; 3 = Regularly; 4 = Often and 5 = Always

		Never	**Sometime**	**Regularly**	**Often**	**Always**
1	I am bothered by fatigue	**1**	**2**	**3**	**4**	**5**
2	I get tired very quickly	**1**	**2**	**3**	**4**	**5**
3	I don’t do much during the day	**1**	**2**	**3**	**4**	**5**
4	I have enough energy for everyday life	**1**	**2**	**3**	**4**	**5**
5	Physically, I feel exhausted	**1**	**2**	**3**	**4**	**5**
6	I have problems to start things	**1**	**2**	**3**	**4**	**5**
7	I have problems to think clearly	**1**	**2**	**3**	**4**	**5**
8	I feel no desire to do anything	**1**	**2**	**3**	**4**	**5**
9	Mentally, I feel exhausted	**1**	**2**	**3**	**4**	**5**
10	When I am doing something, I can concentrate quite well	**1**	**2**	**3**	**4**	**5**

WHOQOL-BREF

This assessment asks show you feel about your quality of life, health, or other areas of your life. **Please answer all the questions.** If you are unsure about which response to give to a question, **please choose the one** that appears most appropriate. This can often be your first response. Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last two weeks.** For example, thinking about the last two weeks, a question might ask:

		(Please circle the number)				
		Very poor	**Poor**	**Neither poor nor good**	**Good**	**Very Good**
1.	How would you rate your quality of life?	**1**	**2**	**3**	**4**	**5**

	(Please circle the number)				
	Very dissatisfied	**Dissatisfied**	**Neither satisfied nor dissatisfied**	**Satisfied**	**Very satisfied**
2. How satisfied are you with your health?	**1**	**2**	**3**	**4**	**5**

The following questions ask about **how much** you have experienced certain things in the last two weeks.

	(Please circle the number)				
	Not at all	**A little**	**A moderate amount**	**Very much**	**An extreme amount**
3. To what extent do you feel that physical pain prevents you from doing what you need to do?	**1**	**2**	**3**	**4**	**5**
4. How much do you need any medical treatment to function in your daily life?	**1**	**2**	**3**	**4**	**5**
5. How much do you enjoy life?	**1**	**2**	**3**	**4**	**5**
6. To what extent do you feel your life to be meaningful?	**1**	**2**	**3**	**4**	**5**

	(Please circle the number)				
	Not at all	**Slightly**	**A Moderate amount**	**Very much**	**Extremely**
7. How well are you able to concentrate?	**1**	**2**	**3**	**4**	**5**
8. How safe do you feel in your daily life?	**1**	**2**	**3**	**4**	**5**
9. How healthy is your physical environment?	**1**	**2**	**3**	**4**	**5**

The following questions ask about **how completely** you experience or were able to do certain things in the last two weeks.

	(Please circle the number)				
	Not at all	**A little**	**Moderately**	**Mostly**	**Completely**
10. Do you have enough energy for everyday life?	**1**	**2**	**3**	**4**	**5**
11. Are you able to accept your bodily appearance?	**1**	**2**	**3**	**4**	**5**
12. Have you enough money to meet your needs?	**1**	**2**	**3**	**4**	**5**
13. How available to you is the information that you need in your day-to-day life?	**1**	**2**	**3**	**4**	**5**
14. To what extent do you have the opportunity for leisure activities?	**1**	**2**	**3**	**4**	**5**

	(Please circle the number)				
	Very poor	**Poor**	**Neither poor nor well**	**Well**	**Very well**
15. How well are you able to get around?	**1**	**2**	**3**	**4**	**5**

The following questions ask you to say how **good** or **satisfied** you have felt about various aspects of your life over the last two weeks.

	(Please circle the number)				
	Very dissatisfied	**Dissatisfied**	**Neither satisfied nor dissatisfied**	**Satisfied**	**Very satisfied**
16. How satisfied are you with your sleep?	**1**	**2**	**3**	**4**	**5**
17. How satisfied are you with your ability to perform your daily living	**1**	**2**	**3**	**4**	**5**

			(Please circle the number)				
			Very dissatisfied	**Dissatisfied**	**Neither satisfied nor dissatisfied**	**Satisfied**	**Very satisfied**
	activities?						
18.	How satisfied are you with your capacity for work?		**1**	**2**	**3**	**4**	**5**
19.	How satisfied are you with your abilities?		**1**	**2**	**3**	**4**	**5**
20.	How satisfied are you with your personal relationships?		**1**	**2**	**3**	**4**	**5**
21.	How satisfied are you with your sex life?		**1**	**2**	**3**	**4**	**5**
22.	How satisfied are you with the support you get from your friends?		**1**	**2**	**3**	**4**	**5**
23.	How satisfied are you with the conditions of your living place?		**1**	**2**	**3**	**4**	**5**
24.	How satisfied are you with your access to health services?		**1**	**2**	**3**	**4**	**5**
25.	How satisfied are you with your mode of transportation?		**1**	**2**	**3**	**4**	**5**

The following question refers to **how often** you have felt or experienced certain things in the last two weeks.

		(Please circle the number)				
		Never	**Seldom**	**Quite often**	**Very often**	**Always**
26.	How often do you have negative feelings, such as blue mood, despair, anxiety, depression?	**1**	**2**	**3**	**4**	**5**

SL SCALE

Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by circling the appropriate number. Please be open and honest in your responding.

1=Strongly Disagree 2=Disagree 3= Slightly Disagree 4= Neither Agree or Disagree 5= Slightly Agree 6= Agree 7= Strongly Agree

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
1	In most ways my life is close to my ideal.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2	The conditions of my life are excellent.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3	I am satisfied with life.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4	So far I have gotten the important things I want in life.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5	If I could live my life over, I would change almost nothing.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

SOCIO-COGNITIVE

RSE SCALE

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle **SA**. If you agree with the statement, circle **A**. If you disagree, circle **D**. If you strongly disagree, circle **SD**.

1.	On the whole, I am satisfied with myself.	SA	A	D	SD
2.	At times, I think I am no good at all.	SA	A	D	SD
3.	I feel that I have a number of good qualities.	SA	A	D	SD
4.	I am able to do things as well as most other people.	SA	A	D	SD
5.	I feel I do not have much to be proud of.	SA	A	D	SD

6.	I certainly feel useless at times.	SA	A	D	SD
7.	I feel that I’m a person of worth, at least on an equal plane with others.	SA	A	D	SD
8.	I wish I could have more respect for myself.	SA	A	D	SD
9.	All in all, I am inclined to feel that I am a failure.	SA	A	D	SD
10.	I take a positive attitude toward myself.	SA	A	D	SD

Life Orientation Test-Revised (LOT-R)

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer.

A= I agree a lot	**B**= I agree a little	**C**= I neither agree nor disagree	**D**= I disagree a little	**E**= I disagree a lot

		A	**B**	**C**	**D**	**E**
1	In uncertain times, I usually expect the best.	○	○	○	○	○
2	It's easy for me to relax	○	○	○	○	○
3	If something can go wrong for me, it will.	○	○	○	○	○
4	I'm always optimistic about my future.	○	○	○	○	○
5	I enjoy my friends a lot.	○	○	○	○	○
6	It's important for me to keep busy.	○	○	○	○	○
7	I hardly ever expect things to go my way	○	○	○	○	○
8	I don't get upset too easily.	○	○	○	○	○
9	I rarely count on good things happening to me.	○	○	○	○	○
10	Overall, I expect more good things to happen to me than bad.	○	○	○	○	○

MOS MODIFIED SOCIAL SUPPORT SURVEY (MSSS)

People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you needed it. Please circle the appropriate response (1, 2, 3...) based on the support available to you during the past 4 weeks. If you are not sure which answer to select, please choose the one answer that comes closest to describing you.

How often is someone available...

		None of the time	A little of the time	Some of the time	Most of the Time	All of the time
1	to help you if you were confined to bed	**1**	**2**	**3**	**4**	**5**
2	to listen to you when you need to talk	**1**	**2**	**3**	**4**	**5**
3	to give you good advice about a crisis	**1**	**2**	**3**	**4**	**5**
4	to take you to the doctor if you needed it	**1**	**2**	**3**	**4**	**5**
5	to shows you love and affection	**1**	**2**	**3**	**4**	**5**
6	to have a good time with	**1**	**2**	**3**	**4**	**5**
7	to give you information to help you understand a situation	**1**	**2**	**3**	**4**	**5**
8	to confide in or talk to about yourself or your problems	**1**	**2**	**3**	**4**	**5**
9	who hugs you	**1**	**2**	**3**	**4**	**5**
10	to get together with for relaxation	**1**	**2**	**3**	**4**	**5**
11	to prepare your meals if you were unable to do it yourself	**1**	**2**	**3**	**4**	**5**
12	to advice you really want	**1**	**2**	**3**	**4**	**5**
13	to help with daily chores if you were sick	**1**	**2**	**3**	**4**	**5**
14	to share your most private worries and fears with	**1**	**2**	**3**	**4**	**5**
15	to turn to for suggestions about how to deal with a personal problem	**1**	**2**	**3**	**4**	**5**
16	to do something enjoyable with	**1**	**2**	**3**	**4**	**5**
17	to understands your problems	**1**	**2**	**3**	**4**	**5**
18	to love and make you feel wanted	**1**	**2**	**3**	**4**	**5**

NRCOPE:

The following items deal with ways you coped with a significant trauma or negative event in your life. These items ask what part religion played in what you did to cope with this negative event. Obviously different people deal with things in different ways, but we are interested in how you tried to deal with it. Each item says something about a particular way of coping. We want to know to what extent you did what the item says. How much or how frequently. Don't answer on the basis of what worked or not – just whether or not you did it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

1. Wondered whether God had abandoned me.
0= Not at all ○
1 = Somewhat ○
2 = Quite a bit ○
3 = A great deal ○

2. Felt punished by God for my lack of devotion.
0= Not at all ○
1 = Somewhat ○
2 = Quite a bit ○
3 = A great deal ○

3. Wondered what I did for God to punish me.
0= Not at all ○
1 = Somewhat ○
2 = Quite a bit ○
3 = A great deal ○

4. Questioned God's love for me
0= Not at all ○
1 = Somewhat ○
2 = Quite a bit ○
3 = A great deal ○

5. Wondered whether my church had abandoned me.
0= Not at all ○
1 = Somewhat ○
2 = Quite a bit ○
3 = A great deal ○

6. Decided the devil made this happen.
0= Not at all ○
1 = Somewhat ○
2 = Quite a bit ○
3 = A great deal ○

7. Questioned the power of God.
0= Not at all ○
1 = Somewhat ○
2 = Quite a bit ○
3 = A great deal ○

GSE SACLE:

Below are ten statements about yourself which may or may not be true. Using the **1-4 scale** below, please indicate your agreement with each item by shading only one box on the following items.

		Not at all true 1	Hardly true 2	Moderately true 3	Exactly true 4
1	I can always manage to solve difficult problems if I try hard enough.	☐	☐	☐	☐
2	If someone opposes or is against me, I can find a way to get what I want.	☐	☐	☐	☐
3	It is easy for me to stick to my plans and accomplish my goals.	☐	☐	☐	☐
4	I am confident that I could deal efficiently with unexpected events.	☐	☐	☐	☐
5	Thanks to my resourcefulness and ability to figure things out, I know how to handle unexpected or unforeseen situations	☐	☐	☐	☐
6	I can solve most problems if I invest the necessary effort.	☐	☐	☐	☐
7	I can remain calm when facing difficulties because I can rely on my coping abilities.	☐	☐	☐	☐
8	When I am confronted with a problem, I can usually find several solutions	☐	☐	☐	☐
9	If I am in trouble, I can usually think of a solution.	☐	☐	☐	☐
10	I can usually handle whatever comes my way.	☐	☐	☐	☐

HLOC (FORMC)

Instructions: Each item below is a belief statement about your medical condition with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you agree or disagree with that statement. The more you agree with a statement, the higher will be the number you circle. The more you disagree with a statement; the lower will be the number you circle. Please make sure that you answer **EVERY ITEM** and that you circle **ONLY ONE** number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

1=STONGLY DISAGREE**(SD)** 2=MODERATELY DISAGREE **(MD)** 3=STRONGLY DISAGREE**(D)**	4=SLIGHTLY AGREE **(A)** 5=MODERATELY AGREE**(MA)** 6=STRONGLY AGREE **(SA)**

		SD	**MD**	**D**	**A**	**MA**	**SA**
1	If my diabetes worsens, it is my own behaviour which determines how soon I will feel better again.	**1**	**2**	**3**	**4**	**5**	**6**
2	As to my diabetes, what will be will be.	**1**	**2**	**3**	**4**	**5**	**6**
3	If I see my doctor regularly, I am less likely to have problems with my diabetes	**1**	**2**	**3**	**4**	**5**	**6**
4	Most things that affect my diabetes happen to me by chance.	**1**	**2**	**3**	**4**	**5**	**6**
5	Whenever my diabetes worsens, I should consult a medically trained Professional.	**1**	**2**	**3**	**4**	**5**	**6**
6	Other people play a big role in whether my diabetes improves, stays the same, or gets worse.	**1**	**2**	**3**	**4**	**5**	**6**
7	Luck plays a big part in determining how my diabetes improves.	**1**	**2**	**3**	**4**	**5**	**6**
8	In order for my diabetes to improve, it is up to other people to see that the right things happen.	**1**	**2**	**3**	**4**	**5**	**6**
9	Following doctor's orders to the letter is the best way to keep my diabetes from getting any worse.	**1**	**2**	**3**	**4**	**5**	**6**
10	If my diabetes worsens, it's a matter of fate.	**1**	**2**	**3**	**4**	**5**	**6**
11	If I am lucky my diabetes will get better.	**1**	**2**	**3**	**4**	**5**	**6**
12	The type of help I receive from other people determines how soon my condition improves.	**1**	**2**	**3**	**4**	**5**	**6**

(SOC) SACLE

Here is a series of questions relating to various aspects of your lives. Each question has seven possible answers. Please mark the number, which expresses your answer, with number **1** and **7** being the extreme answers. If the words under 1 are right for you, circle 1: if the words under 7 are right for you, circle 7. If you feel differently, circle the number which best expresses your feeling. Please give only one answer to each question.

1. Do you have feeling that you don’t really care about what goes on around you?

1	2	3	4	5	6	7
very seldom or never						very often

2. Has it happened in the past that you were surprised by the behaviour of people whom you thought you knew well?

1	2	3	4	5	6	7
never happened						always happened

3. Has it happened that people whom you counted on disappointed you?

1	2	3	4	5	6	7
never happened						always happened

4. Until now your life has had:

1	2	3	4	5	6	7
no clear goals or purpose at all						very clear goals and purpose g

5. Do you have the feeling that you’re being treated unfairly?

1	2	3	4	5	6	7
very often						very seldom or never

6. Do you have the feeling that you are in an unfamiliar situation and don’t know what to do?

1	2	3	4	5	6	7
very often						very seldom or never

7. Doing the thing you do every day is:

1	2	3	4	5	6	7
a source of deep pain andsatisfaction boredom						a source of pleasure

8. Do you have very mixed-up feelings and ideas?

1	2	3	4	5	6	7
very often or never						very seldom

9. Does it happen that you have feelings inside you would rather not feel?

1	2	3	4	5	6	7
very often						very seldom or never

10. Many people – even those with a strong character – sometimes feel like sad sacks (losers) in certain situations. How often have you felt this way in the past?

1	2	3	4	5	6	7
Seldom or never						very often

11. When something happened, have you generally found that:

1	2	3	4	5	6	7
Youoverestimated or underestimated its importance						you saw things in the right proportion

12. How often do you have the feeling that there's little meaning in the things you do in your daily life?

1	2	3	4	5	6	7
very often or never						very seldom

13. How often do you have feelings that you're not sure you can keep under control?

1	2	3	4	5	6	7
very often						very seldom

DUREL: Duke University Religion Index

Please answer the following questions about your religious beliefs and/or involvement. Please indicate your answer with a checkmark in one of the boxes.

(1) How often do you attend church or other religious meetings?

1.Morethanonce/week ☐
2.Onceaweek ☐
3.Afewtimesamonth ☐
4.Afewtimeayear ☐
5.Onceayearorless ☐
6.Never ☐

(2) How often do you spend time in private religious activities, such as prayer, meditation or Bible study?

1.Morethanonceaday ☐
2.Daily ☐
3.Twoormoretimes/week ☐
4.Onceaweek ☐
5.Afewtimesamonth ☐
6.Rarelyornever ☐

Thefollowingsectioncontains3 statements about religious belief or experience. Please mark the extent to which each statement is true or not true for you.

(3)In my life, experience the presence of the Divine (i.e., God).
1.Definitelytrue of me ☐
2.Tends to be true ☐
3.Unsure ☐
4.Tends not to be true ☐
5.Definitelynot true ☐

(4) My religious beliefs are what really lie behind my whole approach to life.
1**.Definitelytrue of me** ☐
2.Tends to be true ☐
3.Unsure ☐
4.Tends not to be true ☐
5.Definitely not true ☐

(5) I try hard to carry my religion over into all other dealings in life.
1.Definitelytrue of me ☐
2.Tends to be true ☐
3.Unsure ☐
4.Tends not to be true ☐
5.Definitelynot true ☐

BriefCOPE

We are interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you generally do and feel when you experience stressful events. Obviously, different events bring out somewhat different responses, but think about **what you usually do when you are under a lot of stress**.

Then respond to each of the following items by circling one number on your answer sheet for each, using the response choices listed just below. Please try to respond to each item separately in your mind from each other item. Choose your answers thoughtfully, and make your answers
As true FOR YOU as you can. Please answer every item. There are no "right "or "wrong" answers,so choose the most accurate answer for YOU—not what you think "most people" would say or do. Indicatewhat YOUusuallydowhen YOUexperienceastressfulevent.

1=I usually don't do this at all 2=I usually do this a little bit 3=I usually do this a medium amount 4=I usually do this a lot

	I usually don't do this at all	**I usually do This a little bit**	**I usually do this a mediumm ount**	**I usually do this a lot**
1. I turn to work or other substitute activities to take my mind off things.	**1**	**2**	**3**	**4**
2. I concentrate my efforts on doing something about the situation I'm in.	**1**	**2**	**3**	**4**
3. I say to myself "this isn't real."	**1**	**2**	**3**	**4**

4. I use alcohol or other drugs to make myself feel better.	**1**	**2**	**3**	**4**
5. I try to get emotional support from friends or relatives.	**1**	**2**	**3**	**4**
6. I give up trying to deal with it.	**1**	**2**	**3**	**4**
7. I take action to try to make the situation better.	**1**	**2**	**3**	**4**
8. I refuse to believe that it has happened.	**1**	**2**	**3**	**4**
9. I say things to let my unpleasant feelings escape.	**1**	**2**	**3**	**4**
10.I try to get help and advice from other people.	**1**	**2**	**3**	**4**
11.I use alcohol or other drugs to help me get through it.	**1**	**2**	**3**	**4**
12.I try to see it in a different light, to make it seem more positive.	**1**	**2**	**3**	**4**
13.I criticize myself.	**1**	**2**	**3**	**4**
14.I try to come up with a strategy about what to do.	**1**	**2**	**3**	**4**
15.I get comfort and understanding from someone.	**1**	**2**	**3**	**4**
16.I give up the attempt to cope.	**1**	**2**	**3**	**4**
17.I look for something good in what is happening.	**1**	**2**	**3**	**4**
18.I make jokes about it.	**1**	**2**	**3**	**4**
19.I do something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.	**1**	**2**	**3**	**4**
20.I acceptthe realityof thefactthatithas happened.	**1**	**2**	**3**	**4**
21.I express my negative feelings.	**1**	**2**	**3**	**4**
22.I try to find comfort in my religion or spiritual beliefs.	**1**	**2**	**3**	**4**
23.I try to get advice or help from someoneabout what to do	**1**	**2**	**3**	**4**
24.I learn to live with it.	**1**	**2**	**3**	**4**
25.I think hard about what steps to take	**1**	**2**	**3**	**4**
26.I blame myself for things that happened.	**1**	**2**	**3**	**4**
27.I pray or meditate more than usual.	**1**	**2**	**3**	**4**
28.I make fun of the situation.	**1**	**2**	**3**	**4**

APPENDIX: B

FOCUS GROUP DISCUSSSION PARTICIPANTS VOLUNTARY SHEET

PART A:

Instruction: Please you are only required to filled the part A of this sheet

Please indicate if you will be willing to participate in a group discussion phase 2 of this study.

Yes ○ No ○

Gender: Male ○ Female ○

What is your Ethnic Group: Hausa ○ Igbo ○ Yoruba ○ Others Please indicate ---------------------

Your Phone Number --------------------------------------

PART B: For researcher only

Hospital Name: ------------------------------------

Researcher Remark: Is participant contacted and arranged for the group discussion? **Yes/ No**

THANKS I HOPE TO BE IN CONTACT WITH YOU SOON

APPENDIX:C

UNIVERSITY OF GLOUCESTERSHIRE
at Cheltenham and Gloucester

Natural & Social Sciences,
Francis Close Hall,
University of Gloucestershire,
Cheltenham, Gloucestershire,
GL50 4AZ
U.K.

Information Sheet

IRB Research approval number:

This approval will elapse on:

Title of the research: ***Ethnic and Gender differences in the relationship between Psychological, socio-cognitive and socio-demographics Variables in people with diabetes Mellitus in Nigeria.***

Thank you for showing an interest in this study. Please read this information sheet carefully before deciding whether or not to take part. If you decide to take part we thank you. If you decide not to take part there will be no disadvantage to you of any kind and we thank you for considering our request**.** The research forms the basis of a PhD degree in (Health Psychology) at the University of Gloucestershire, England United Kingdom.

Purpose of Research: The current study intends to assess the prevalence, differences and correlates of Psychological, Socio-cognitive and Socio-demographic health factors among clinically diagnosed diabetic patients in Nigeria.

Procedure of the research, what shall be required of each participants and approximate total number of participants that would be involved in the research:

This study will stratify participants based on time frame patients whose diagnoses are between 1-12 months. You will be inform and explained to issues related to your participation and once you are happy with the information you will need to fill the questionnaire and hand it back to the investigator. The expected goal of sample is to recruit 600 participants in 4 randomly selected Teaching hospitals throughout the Federal Republic of Nigeria.

Expected duration of research and participants (s)' involvements:

In total, you are expected to be involved in this research for 1 day. The questionnaire will take you between 45 minutes to 1 hour to fill.

Risk(s):

It is not anticipated that there will be any risks resulting from your participation in this study. However, if you are concerned at any stage throughout the study please contact your local support healthcare services or the principal investigator.

Cost to participants, if any, of joining the research:

Your participation in this research will not cost you anything.

Benefit(s):

The information will help health professionals to know how we can provide care differently to meet your needs better and the only way we can find out those things is to ask <u>you</u>. The information you provide will be used to help improve the health care provided to people with diabetes in the future.

Confidentiality:

Your individual information collected in this study will be given code numbers and no name will be recorded. However, since this study forms part of a University degree a thesis will be submitted to University of Gloucestershire. It may also be published in Psychological/Medical journals. No material which could personally identify you will be used in any report on this study. Results of the study will be sent to all participants who requested them once the study has been completed. If you would like to discuss the outcomes the Principal Investigator is happy to talk to you.

Voluntariness:

Your participation in this research is entirely voluntary.

Alternatives to participation:

If you choose not to participate, this will not affect your treatments in this hospital in any way.

Due inducement(s):

You will not be paid any fees for your participation during the first phase of this research; however participants chosen for the second Phase of this research will be given a sum of ₦1,000 each for transportation.

Consequences of participants' decision to withdraw from research and procedure for orderly termination of participation:

You can also choose to withdraw at any time. Please note that this applies mainly on the time or period of data collection. This is because after the questionnaire is been handed over to the investigator it becomes more difficult for personal details to be traced as questionnaire were anonymous. However the researcher promise to make good faith effort to comply with your wishes as much as is practicable.

Modality of providing treatments and action(s) to be taken in case of injury or adverse events(s):
If you suffer any injury as a result of your participation in this research, you will be treated at this hospital and the researcher will bear the cost of this treatments.

What happens to research participants and communities when the research is over:

During the course of this research, you will be informed about any information that may affect your participants. Results of the study will be sent to all participants who requested them once the study has been completed. If you would like to discuss the outcomes the Principal Investigator is happy to talk to you.

Statements about sharing of benefits among researchers and whether this includes or exclude research participants:

If this research leads to commercial products, the University of Gloucestershire and the principal investigator shall jointly owned it. There is no plan to contact any participants now or in the future about such commercial benefits.

Student researcher local address in Nigeria
Road 3, 4A Agip Housing estate,
Mile 4 Rumueme, Port Harcourt,
Rivers State, Nigeria
Tel 08136742014
E-mail: onyekadavid@yahoo.co.uk

Name and full address of Head Supervisor
Professor Dianne Catherwood,
School of Natural & Social Sciences,
Francis Close Hall campus, University of Gloucestershire,
Cheltenham, GL50 4AZ, U.K. Phone +44 1242 714808 dcatherwood@glos.ac.uk

APPENDIX: D

Consent for Participants

I have read (or have had read to me) the information sheet concerning this research and understand the explanation of what it is about. I had an opportunity to ask questions and all my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage from the address provided.

I understand that:

1. My participation in the study is entirely voluntary (my choice);
2. I am free to withdraw from the study an any time without any disadvantage;
3. The data will be destroyed at the conclusion of my study but any unprocessed information on which the results of the study depend will be kept in secure storage for five years, after which it will be destroyed;
4. Any information I provide will be kept confidential to the researcher and his supervisor; and that no material which could identify me will be used in any reports of this study;
5. That no discomfort or risk is associated with my taking part in this study;
6. I understand that no remuneration or compensation will be given in this first phase study;
7. The results of the study may be published and available in the library but every attempt will be made to protect my identity.

I consent to take part in this study.

……………………………………………… ………………………………….
(Signature of Participant) Date

Researcher Name………………………………….. Signature ……………………….Date…………………..

I will like to receive a summary of the study outcome: **Yes /No** (Circle one).

This research has been approved by the University Research Degree Committee (URDC) University of Gloucestershire and the chairperson of this committee can be contacted at Faculty of Applied Sciences Postgraduate Research Director Co-Director Exercise and Sport Research Centre University of Gloucestershire **Email:**mdestecroix@glos.ac.uk**Telephone:** +44 (0)1242 715159. Or the head, supervisory team **Professor Dianne (Di) Catherwood**, on dcatherwood@glos.ac.uk, **Telephone** +44 (0) 1242 714808.

APPENDIX: E

Focus Group Discussion (FGD) Interview Guide

I. Warm-up and Explanation (10 minutes)

A. Introduction

a. Thanks for coming.

b. Your presence is important; you are representing many patients.

c. Explain and read Informed Consent/Confidentiality document No signatures needed.

d. Describe importance of information they are providing; may help other patients with diabetes receiving care at the hospital.

e. Describe what a focus group is – to learn about your beliefs and viewpoints.

B. Purpose

a. We will be discussing your experiences in regards to the problems, and challenges in managing your diabetes and how we may be able to provide better care/information to you.

b. I'm interested in all your ideas, comments, and suggestions.

c. All comments - both positive and negative - are welcome.

d. Please feel free to disagree with one another. We want to have many points of view.

C. Procedure

a. Explain that session is being recorded and check if there are some objections. All comments are confidential and will be used only for project purposes. Nothing will be reported to your primary care provider or anyone else. This session will last 60 minutes.

b. I want this to be a group discussion, so don't wait for me to call on you. Please speak one at a time so that the recorder can pick up everything.

c. We have a lot of ground to cover, so I may change the subject or move ahead. Please stop me if you want to add something.

d.Give Focus Group Demographic and Survey form. Please complete this short demographic and survey form. Please do not write your name – your answers will remain confidential and private.

Turn on Tape Recorder

D. Self-Introductions

a. Ask each participant to introduce him or herself, but only use first name. Tell us your name and something about yourself.

Probe*: What ethnic group are you from?*

Are you employed, in school, or work at home?

II. Let us start by looking at the existing levels of your day to day life about your diabetes. (15 minutes)

Can you tell me how you feel/ diabetes affects your daily life experiences?

And/or maybe (Is this a concern for you? To what extent do you place importance on the concerns?

Tell me, do you usually or currently feel that being diabetic you are prone to the consequence of diabetes that is the complications?) ***Probe****: Is this an issue for you? – In what way?* (*In what way is this causing Psychological distress)?*(Get a rough figure and proceed). – *Why not?*

5. What would you say are the major challenges of being diabetic? ***(Probe:*** *How did you feel about those challenges of been diabetic? Is it a negative experience in your life? If so, explain how it is negative. Is it a positive experience in your life? If so, in what ways it is positive.* ***Probe:*** *What is it that makes it good or bad?*

III. Problem solving (20 minutes)

A. What is hard for you about taking care of your diabetes?
Probe: *money, transportation, time, appointment availability, plans to exercise, knowing food choices, diet, treatment or family issues. What do you do to address such problems?*

B. How do you deal with problems that come up with taking care of your diabetes? ***Probe***: *How would you describe your typical ways of coping about the problems in your life?*

C. What do you do when the same problems come up over and over again***? Probe:*** *Resilience factors (capacity belief- self efficacy, control beliefs -locus of control*

D. What do you do when new problems come up?

E. What types of things help you handle problems with your diabetes? ***Probe:****Do you use any spiritual and or/ physical means to deal with problem such as churches or exercise? If so, please describe how.*

V. What is your experience from health care and social support networks (10 minutes)

In your view describe either a good or bad experience you have being receiving from health care providers, family members and friends in managing your diabetes?***Probe***: *Are there specific barriers to receiving diabetes care?What made the experience either good or bad?*

REITERATE CONFIDENTIALITY – it is okay to share, your name will not be mentioned or recorded and will not affect the care you receive at the hospital

VI. Closing (5 minutes)
A. Before we finish, I'd like to go around the room one more time just to see if there's anything else you'd like to say about the topics we've discussed (Reflect on prior comments).
B. Thank you so much for coming. Your time is much appreciated, and your insights have been very helpful.
C. Provide an inceptive

E. List four (or more) themes that you discovered throughout the focus group and share with Research Assistant via email.

APPENDIX: F

FOCUS GROUP INTERVIEW TRANSCRIPT

Themes and sub-themes emerging from the thematic analysis

Themes	Sub-themes
Adaptation and Self-management	*Acceptance & Integration, Opportunity to improve one health, Information aid compliance.*
Personal Impact	*Finance, Career, Vocational and Physical work, Bearing multiple responsibility for self & others, Altering of one potential*
Worries about present & future	*Living in Uncertainty, Fear of complication, Fear of losing loves one and job.*
Medical System Frustration	*Insufficient time in consulting, Appointment day frustration, Long waiting time, difficulty in understanding.*
Non-Adherence	*Self-failure to compliance, Failure to adherence due to financial constraints, difficulty of constant diet, failure to compliance due to forgetfulness.*
Interpersonal Interaction and social isolation	*Rejection, Access to social role, Labeling, Criticism.*
Empowerment to Self-management	*Lack of knowledge, Failed expectation.*
Medical and regimen task	*Dissatisfaction with treatment options.*

Theme one: Adaptation and self-management

<Internals\\Diabetic patient FG> - § 28 references coded [15.27% Coverage]

*Sub-theme: Acceptance and Integration (**n=7**)*

Reference 11 - 0.35% Coverage

I have being trying my best to be able to manage this sickness called diabetes because most times what my doctor said I shouldn't eat I'm kind of avoiding to eat them even when the temptation is there you have no option but to avoid eating if you love your life because as human being if you want to just satisfied yourself at the moment then prepare for the worst ***[Male 42, Yoruba Type 2]***

Reference 13 - 0.30% Coverage

*the doctor told me ehm if I don't take care of myself, this illness diabetes will kill me on time as it will go to the chronic level of it and when it does then I will be the one to suffer it so that has being what motivated me to stick to all the required food intake and following my medications routine.****[Male 50, Others Type 2]***

Reference 15 - 1.09% Coverage

I know the consequences of not following my medication and not obey the rules although the rules are so many that sometime it becomes difficult to obey all but because my physician created so much fear in me on what will happen if I don't adhere that is why I told you earlier on that I have decided to sacrifice most of my lifestyle because of the diabetes to avoid those complications you know that might result from my inability to not adhere, because of my future I don't want a situation where I can't feed my family I don't want a situation where I can't go to work I love my job so much even in my place of work I do everything , I do wear globes , I wear my foot protecting equipment's eh clothing's my boot is very different from every other persons own my hamlet is different even when people use bear hands to do some work I use globes to do the work so it gives me extra cost in buying my PPE that is my personal practice equipment's always so sometime people say I'm over careful but these are the prizes I have to pay because of my condition so I keep doing it because of fear of having problem in the future. ***[Male 47, Yoruba Type 2]***

"I have now come to understand that being diabetic you are going to have to work, you are going to cry, you are going to get frustrated, you are going to change your plans and you are going to hate yourself, but you are going to get through it, so there is no point in just killing yourself, so you have got to live for something and take care of yourself, it is not a day thing, it is not something you come to know within a day, it is definitely a process. For me I think no matter what and how my condition is going now, I have the awareness that having diabetes is like having a terrible friend you have got to live with, so you have to get well along with. So focusing on the challenges it involved its weigh one down and which I have just make sure I eat well as if I'm fine and trying my best, that is what I did, and I felt really good, in fact I felt like I don't have diabetes anymore" ***[Male 50, Others Type 2]***

Reference 18 - 0.56% Coverage

what has helped my condition has to do much about me not necessarily what people can really do for me, however I do recognized the support from people can really be of help some time but the patients I mean myself have to take the bull by the horn so after I gave real thought to my condition that my happiness is in my hand so even since that day it has being a different experience for me altogether because I now know what to do every time to make myself not getting upset even it warrant me to be upset because it all will make me or add more problem to my condition.

[Male 42, Hausa Type 2]

Reference 19 - 0.87% Coverage

since I got to know it to be a lifetime illness, I just decided to take it in good fate because when you wake up in every day you will start to be thinking, how will you start that day. But there is nothing I can really do than just seal up my heart about the whole thing and try as much as possible to live with it, after all it is a condition for the rest of my life, because if you too much fixing your attention on the way the difficulty that will actually stand against your progress for life I have come to learn one thing and that is there is nothing now that has never happened before I got to have this illness there are others also who have had it too and more will still continue to have it, is the environment we are just living I think so and why I just have to live with it if is like a sickness which is only me that is having it then that should a big issue for me but this one is not. ***[Male 46, Igbo Type 2]***

Reference 28 - 0.50% Coverage

There is no real point in creating more problems to the one I have already seriously, so therefore to be a diabetic patient is not the end of life. In fact I see it more like a journey I need to go through because I caused it for myself it is all my faults you see people still have diabetes and live well with it, for me there is worse diseases than diabetes so I don't worry myself over the illness, as the doctor usually explained that it all just depend on me now and nobody can do it for me so you got to carry on because it is my own cross. ***[Male 44, Igbo Type 2]***

*Sub-theme: Opportunity to improve one's health (****n = 2)***

Reference 10 - 0.33% Coverage

after i was diagnosed with diabetes I got to know the importance of managing my health irrespective of severe family problems I decided to seek for information on the best way I can really manage my health, you know I can said that the diagnoses of diabetes has provided me with a good opportunity to put an eye on my lifestyle and diet. ***[Male 47 Yoruba Type 2]***

Reference 6 - 0.45% Coverage

diabetes does give so much challenge as you have to be up doing every time, but honestly comparing other disease with diabetes if you ask me to choose I rather choose diabetes because this diabetes teaches you how to live a healthy life, like now that I know eating is best for me, I'm one of the heathiest people in my family. At least in the way I eat although not my organs and everything, but my diet is the heathiest diet out of my entire family and friends ***[Male 50, Others Type 2]***

Sub-theme: Information aid compliance: ***(n = 3)***

Reference 8 - 0.79% Coverage

when I was diagnosed I did not have enough information on what my condition is all about and my wife was troubled too because all what the doctor told us that day that I will be taking the medication he asked us to buy and that I need to avoid any carbohydrate food so we left the hospital that I can still remember how serious it look like for me over one week period I couldn't take food because all available food in the house are more of carbohydrate food. And you know all my children are all married only me and my wife are left at home so the children only come for visit, not until 2 months later when one of my sons visited me, he started teaching me and explaining to me what diabetes is about and how I can really control it and then make a meal time table for me and I still follow that plans till today. ***[Male 50, Others Type 2]***

Reference 9 - 0.53% Coverage

There is a saying that the problem shared is problem solved, when I shared my situation with my friends most of them was sympathizing with me and I see their willingness in showing their support I never know or had it in mind that they would treat me fine, to me this is more than encouragement because if you know the feeling that one get when you discovered that you got people who is there for you and not just that but also contributing in making sure things move well for you with this kind of illness diabetes that is hopeful you know. ***[Male 42, Hausa Type 2]***

Reference 17 - 0.92% Coverage

While friends ehm this where I'm coming in, you understand, I had asked some of you like my brother [...] he said he had diabetes over 6 months, again so my own case it has being longer so I have more experience okay my own is almost a year now so I felt this way when it all started trying to hide and all that but my physician warned me that hiding myself and trying to behave like every other person and not facing the reality of my condition it will worsen because it will make me not to take my medication it will make me overlook certain things by just behaving like others. And that there are a lot of diabetic patients who are professor who are even engineer , lawyer they are successful people some many of them live very well too in fact even the former president of this country Nigeria Olusegun Obasanjo he is diabetic he is still very healthy today. So is all left for me now to be on the doing in seeing every day of health goes well.

Theme Two: Personal Impact

<Internals\\Diabetic patient FG> - § 24 references coded [9.22% Coverage]

*Sub-theme: Finance (**n** = 2)*

Reference 12 - 0.39% Coverage

*I use to sell and have some money but this diabetes has real affected me, I don't use to have enough money again unlike before when I'm not sick... I feel tiredness and weak… so many things on my head, which I hardly due anything this days and that aspect has being affecting me, and any time I'm couched up like that I don't sleep well then …next morning I can't really do anything again you see me so weak [**Female 24, Others Type 1]***

Reference 24 - 0.77% Coverage

it is expensive to take good care of diabetes, you know as for me it's more of the monetary support that I really want to follow the doctors instruction that means my eating habit has to change and actually it has really change, but my headache has now being that going for those recommended food that really support my eating habit as I have wished is very costly to constantly buy them for myself… it is very hard why because I have kids to take care of in the university, coupled with fact that I'm retired and the most painful part of this is that I retired from this hospital and my pension is just #12,000 and the policy of the hospital is that before you will be entitled for the free NIS you must pay the sum of #18,000 par year which is very difficult thing to save such amount to pay. ***[Female 68, others Type 2]***

Sub-theme: Career (**n** = **3**)

Reference 3 - 0.33% Coverage

*Even since my doctor diagnose me of diabetes I have never being in peace and at night when I want to stand and read my book I leave my book start thinking of the illness am so helpless I don't know what to do sometime I seat and cry because I don't know it has not been easy, for me my studies it has been very really disturbing me a lot…failure has being , I mean the important things I have being fighting for since I became a diabetic patients at times I do have carry over because of the illness**[Female 23, Yoruba Type 1]***

Reference 11 - 0.55% Coverage

Diabetes has created for me just to be so tired, as if you have not sleep for about two or three days. Your eyes actually physically become too hard to hold open, in fact I got *really sluggish and lazy. I don't even want to get up or move around this has affected my performance as a student I have missed several assignment as I could not do them on time and lecturers don't accept nonsense excuses, so this whole thing gives me concern as young as I'm how long would will I be struggling with this condition in a country like Nigeria where things are very difficult.*

Female 22, Hausa Type 1

Reference 21 - 0.57% Coverage

*Having diabetes affect my attendance, I mean have being missing my classes steadily in the school, I have low grads in the exam which ordinarily I know if not because of my present illness I shouldn't have scored lower grades , is it my lunch which use to be different every day and sometimes I missed having my lunch because I have to stay up for the lectures that are arranged for over a stretch of 6 hours without break you know this inconsistence is kind of panicking and sometime you don't seems to just understand how to really put all these things together your life and your career.**[Male 21, Yoruba Type 1]***

*Sub-theme: Vocational and physical work impact (**n = 2**)*

Reference 4 - 0.24% Coverage

*Just of recent my oga has noticed and have started to complain because I have failed in meeting up account due to the fact I get no strength again like before I use to work very hard and everything was fine but now is so-so frustrating for me, you know. **Male 24, Igbo Type 1***

Reference 18 - 0.44% Coverage

*I'm an auto-mechanic I work on cars so the nature of my job is such that we are prone to injury either we have small cut when we are trying to work in the engine, trying to loosen engine parts and some we try to use our hands to remove components one or two things from the engine and before you know I will have a scratch, so the thing has being making me to be too careful and then it will slow down my job you know it will also slow down my income. **Male 47, Yoruba Type 2***

*Sub-theme: Bearing Multiple responsibility for self and others (**n = 4**)*

Reference 1 - 0.25% Coverage

*as a driver I have being finding it hard to give account and moreover I have to feed my family and pay house rent, children school fee and everything and as it stands now even as 'am speaking with you 'I'm not fine because so many things that I'm facing. **[Male 24, Igbo Type 1]***

Reference 9 - 0.24% Coverage

As a married women with children no house help only me it has not being easy as a trader on top is not easy o to cope with this diabetes every day you will wake you have to do this, you have to do that in fact it has affected my entire life negatively **. *[Female 24, Others Type 1]***

Reference 22 - 0.42% Coverage

*I find it hard to cope with my condition because I got so many things to take off, my 6 children and my husband. Most of my days are so fully of cooking, washing and managing the household activities and in addition to that I have to be watchful about what I eat and do, you see you got too much work to do in the house without any help or support from any one with all these truly I find it very hard to really take of my condition. [**Female 45, Others Type 2]***

Reference 23 - 0.43% Coverage

*as a mother I'm the cook for the family, and for me I usually cook two meals one for me and one for the family, however, I have informed my children that look for me doing the whole preparation is just frustrating while I have continued doing the cooking is because they are still tender and as such can't really cook for themselves … I just try keep telling my children about how difficult it is for me to do the meal preparations always.**[Female 43, Others Type 2]***

*Sub-theme: Altering of ones self-potential (**n = 4**)*

Reference 6 - 0.47% Coverage

*I'm a talkative before, but this diabetes has made me to be a shy person I don't use to talk again am sad, I use to be moody, I just will be looking at people when they pass in-fact diabetes has told me shout up so even now people has started asking me madam ehm wow you've change oh you don't talk again this diabetes has weigh me down it has touch my emotion I don't do the way I use to be, I use to be a sociable somebody you know but it has calm me down so that is problem in this diabetes. [**Female 24, Others Type 1]***

Reference 14 - 0.36% Coverage

I use to be driving from morning till night and even going to any distance, but this days when I just drive small I will rest small and when I do rest I don't usually meet up the *account for that day. Also like before I do jugging and road work and other things sometimes, but because of this sickness diabetes so much has change and reduced and is just like tiring me. [**Male 24, Igbo Type 1]***

Reference 19 - 0.51% Coverage

*I have passion for missionary work as a Christian I involved in a lot of things. I used to volunteer. I was the evangelist coordinator for our church youth ministry; when I found out I had diabetes, I just didn't get involved with them as much, it was kind of hard to just keep doing it all and as such it gives me concern on my ability to function and who knows the way things might turn out in future so it worries me a lot just imagine what you have passion for you see yourself not even getting alone in doing them. [**Male 21, Yoruba Type 1]***

Reference 17 - 0.31% Coverage

*anytime I think about this diabetes I don't sleep well at night so you know what it mean one will not be sleeping all the long time it gives me problem the next morning, I'm not myself as I can't do anything and I can't cope with my day to day activities feeling tired and weak so these are areas ehm I'm being affected. [**Female 40, Igbo Type 2]***

Theme Three: Worrying about Present and Future

<Internals\\Diabetic patient FG> - § 19 references coded [9.40% Coverage]

*Sub-theme: Living in Uncertainty (**n = 9**)*

Reference 1 - 0.29% Coverage

Any time it is just five o clock in the morning […]my mind fly's I will think oh how I will cope that day how is my activity going to look like how am I going to take care of my little kids send them to school then my husband my house chaos then, I will go to my place of business it has never being easy[…] now I don't even make enough of money in my business as I use to make because of diabetes and which money will I use treating myself so is a really problem on my own side presently and […] in time to come who knows how it will be if I don't take care of myself now.
*[**Female 24, Others Type 1]***

Reference 7 - 0.70% Coverage

Recounting on what my condition has put my parents, I feel so sorry because I just keep wondering how a young girl in my 20s can really go far with the financial demand of my illness. In fact my Parents are heartbroken because of my condition but there is nothing they could to help, as a retired civil servants they try's everything possible to make me happy if I needed money for something they would give me money, to me I feel so worried due to the amount of money they are spending on my health even some times I will deliberately lair to them that I still have medications just to avoid them spending too much. As I'm speaking it makes me to feel confused, I don't know how really to handle the whole situation. ***[Female 23, Yoruba Type 1]***

Reference 9 - 0.33% Coverage

I feel so hopeless about myself like I used to want children, I used to want to travel the world I used to want to do everything I have the desire, I just know I can't necessarily do it as easily. I can't just take off for myself and visit friend or family for a year and expect it to all be okay. It is not always going to work out. ***[Female 22, Hausa Type 1]***

Reference 10 - 0.58% Coverage

diabetes is scaring and threaten because is not just a disease for the poor like me as it required money, just over 6 months so my business has reduced since I got this illness. I'm the bread winner of a family of five, my husband has no job over 3 year now and how the family is surviving is being from my business. So this diabetes has created a total fear for me I wouldn't be the main financial provider of my family and my children and my husband will be really disappointed if things goes worst and I can't just imagine how the family will be feeding and surviving with this my diabetes. ***[Female 49, Igbo Type 2]***

Reference 11 - 0.57% Coverage

My problem presently is money because is what you need to buy the medication and then for the future I'm afraid because it might get worsen by my present inability of handling my illness because I know very well each time I get to the hospital and see some patients who are diabetic I feel so sorry for them of the difficulties […] when I look at what they are going through I will just be imaging if I will be able to go through all this kind of things in the future so I'm always afraid of the future, don't know what might come up of it since I'm unable to manage my sickness. ***[Male 21, Yoruba Type 1]***

Reference 12 - 0.43% Coverage

since I got diabetes my entire life has change […] my eating habit with diabetes is like you will desire to eat want hungry you I mean what you have appetite for like beef meat and all that and you will see them but because of diabetes you can just eat them to me do you call that life…this happens all the times and to me it make me feel so worried as I don't really know how long I can go on with denial myself things that I'm used to eat.
[Female 68, Others Type 2]

Reference 13 - 0.78% Coverage

My parents are diabetic and my husband is also a diabetic and myself I'm also diabetic although my was just diagnosed 8 months now[…] do you know again two of our sons are also diabetic and already we've lost one of them for the case of diabetes. With all this just happening on one family are we the only people on this world that deserve this kind of illness even these day I can see fear in the looks in my son eyes and it all pain me greatly because I contributed to his suffering now. I got to discovered my husband parents had diabetes too you can see that both my parents and my husband parent do have diabetes […] it's all sad story to hear, I'm very much worry what a diabetic family await the future of my son and the unborn once what can I do as this is the trouble that is eating me up like worm. ***[Female 45, Others Type 2]***

Reference 14 - 0.50% Coverage

Having diabetes is full of stress, like how you will survival the challenges you have with your school demands in fact you stress about your future a lot, about life, about moving on, especially as a young person, about being able to afford what it takes for the rest of your life, I need a job that either has really good health benefits or make enough money that I can afford to stay alive because you can't depend off your parents or friends forever. I think that is one of the serious parts of this my illness.
[Male 22 Hausa Type 1]

Reference 19 - 0.52% Coverage

when you look at all the things involve in this illness you will feel hopeless, where is the money to pay for the medication most time you have to borrow money so that you can buy the medication. Presently I'm owning people who helped me borrowed money you know how long will I continue to be asking people for money to use buy medication and already the other time I asked of the people who usually gives me money she turned me *off all because I was still owning her so whenever I have money will be the time I can really buy my medication. [**Female 43, Others Type 2]***

*Sub-theme: Fear of complications (**n = 3**)*

Reference 2 - 0.64% Coverage
as a single who is not married the major thing that is giving me concern is on the complication… as I can't just imaging myself as a beautiful girl to begin having foot ulcer, like the other day I saw people with bandages, and others having amputation you know because of this diabetes you see the future is too beautiful for me, now by the time I start bandaging my legs because of may be complications of a thing do to diabetes what will happen to me it will not be fun because men will run away from me so I don't think I will like that, but how long will this illness diabetes continue every time you will be adjusting- adjusting, today you are on this , tomorrow you are on that so … my future is really given me concern as a single with diabetes. ***[Female 22, Hausa Type 1]***

Reference 6 - 0.36% Coverage
*like I said earlier I use to fail myself, you know at times I will say okay let me eat now only for today I don't have money the fear of it, is that if I don't take care of myself and stay away from those eh foods Doctor said I should not eat and take medication properly and I will be victim of the complication may be one day so that has always being my fear. [**Female 24, Others Type 1]***

Reference 17 - 0.70% Coverage
I'm very much aware that taking my medication and following the lay down rules for diabetic patient is only way I can really manage my condition, but I just like telling myself how long can you be taking medication and abstaining from normal foods then another though will then come into my mind I mean disturbing thought that what is the essence of even following all that doctor have said you shouldn't eat that I will develop some kind of complications wither I'm trying to follow or not you know because I know for sure that since I don't usually have money on a regular basis to buy my medication and all others things that my health might get worsen, this is very hard situation and is just all sad experience for me. ***Female 45, Others Type 2]***

*Sub-theme: Fear of losing loved ones and job (**n = 3**)*

Reference 5 - 0.51% Coverage

[…] my concern is that my parents know about my diabetes but my fancies does not know or noticed anything of it and that is my fear oh, that is my fear.

MODERATOR PROBE: Why do you think he shouldn't know?

if I tell him now he might leave me for other you know that there are other fine, fine girls and beautiful girls and he might go for one, am afraid I don't want to lose him that is it.

MODERATOR PROBE: **Does it give you concern and if it does how?**

'Am afraid of losing him and if I tell him now don't know what can happen'.

[Female 23, Yoruba Type 1]

Reference 8 - 0.27% Coverage

seriously I will not lie to you for my career it has changed so many things you know as a drive I will try everything possible to make sure I meet up account, and that there are some many competition everywhere and my ago may likely take this car from me if things contained this way. ***[Male 24, Igbo Type 1]***

Reference 15 - 0.48% Coverage

*My biggest problem as a diabetic patient is that I just feel physically weak and the work I do required to be up doing you know after my retirement I only go for jobs for people that is farming so because of this diabetes I can't really do much and it gives me concern because since the farming I do is only what I used to take care of my health and my family if I'm not able to work well to the standard in the cultivation of the farm land as required then I may stand chance of losing the work.****[Female 68, Others Type 2]***

Theme four: Healthcare System Frustration

<Internals\\Diabetic patient FG> - § 15 references coded [5.30% Coverage]

*Sub- theme: Insufficient time in consulting (**n= 6**)*

Reference 2 - 0.34% Coverage

When you got appointment to the hospital, the doctor will be then telling you what is *going to happen over the next few weeks which requires one to do them and will be very brief about all the things that is expected to do, in fact the doctor tells you to come back within three months but there are no free appointments and it doesn't matter if you insist because everything's full up. They tell you '… that's the way it is …' and give you an appointment for four months' time" so to me it so difficult to really understand most of the things and truly I felt so confused on what to avoid and what exactly I'm to eat.* ***[Female 42, Hausa Type 2]***

Reference 6 - 0.28% Coverage

This days my experience in seeing the doctor that supposed to examine me and tell me what next to do each time… getting to the hospital there will be a long cue and if I finally see the doctor he will just be in the rush and give me another appointment to come see him it's so painful. ***[Male24, Igbo Type 1]***

Reference 9 - 0.29% Coverage

Yes the doctor will be rushing and will not take time to talk to you …the doctor will just say madam don't worry, don't worry every time don't worry, don, worry you know, even if you want to explain something he will say ehm okay, okay […] the next thing you will see take the paper go and buy your drugs. ***[Female 24, Others Type 1]***

Reference 11 - 0.26% Coverage

[...]the doctor attitude towards patients, they be like please telling you don't worry' don't worry whereas you are trying to explain how you are feeling they would not want you to explain because you are always wrong not adhering to instructions and this attitude upset me. ***[Female 40, Igbo Type 2]***

Reference 14 - 0.36% Coverage

when you ask question the way the question will be answered will be just in hurry and some time you will be told don't worry, we will talk about that next time, and then you will be like trying to say something but at the end of the day you be rushed. So you like a blind person who is being directed on the way to go because you don't have your own control for your life. ***[Female 43, Others Type 2]***

Reference 15 - 0.46% Coverage

I think there is need for the management to reduce the interval we are normally given to come for our appointments because you will see something the need to visit the doctor may be due some sudden change you have noticed but you have then wait until whenever you have being giving appointment which usually takes longer periods sometimes months you know so I think illness like diabetes should be given at most two weeks' time I strongly pray that it really can be like that. **[Female 45, Others Type 2]**

*Sub-theme: Appointment day frustration (**n = 4**)*

Reference 3 - 0.96% Coverage

it makes me feel down especially when I go for visit when I go for my appointment any day I have to go for appointment it has always being giving me serious tough time, to wake early that day to meet up because if you don't go early you will not come back early[...]you will stay on the cue on the line before your own turn will get to you then from there you go and pay, do test then from there before you will be done l, my appointment day has always being the worse day anytime am visiting, it has always being worse day for me so it always weigh my spirit down because by the time I go there I will see other people I will be looking at them some with big-big wound on their legs I will ask what kind of wound is this and I will be told that it is diabetes that cause it and I will say ahah my own has not gotten to this level o so later on I will be thinking does it means that ehm if I don't take care of myself my own will also get to this level at times I will boast into crying. **[Female 24, Others Type 1]**

Reference 4 - 0.61% Coverage

if you go to hospital you will see cue long cue and you know, me being a driver I don't have to come and stay on the cue for long time, at some time I will almost think to give up this treatment is so frustrating and because of my work to make sure I met up with the account, like as I use to give before you know and see the long cue you wouldn't not know where you will stand wither you will seat and even if you stand or seat you will spend the whole day in the hospital which myself I suppose to use and get money[...] seriously I'm really tired. **[Male 24, Igbo Type 1]**

Reference 10 - 0.18% Coverage

during appointment days it has always being giving me a lot of concern and do you know what often time when you will go for your appointment to see the doctor there will be always a long cue, you see being a diabetic is frustrating and even to seek for

medical care frustrates the more.
[Female 40, Igbo Type 2]

Reference 12 - 0.62% Coverage
My entire life is dominated with diabetes, you will be so tired the way you are being treated when you go for your appointment in the hospital and the one that disturbs me is the confusion you will have at the end of the day.

Moderator Probe: Why does it become for you confusion, please could you say more about it?

Okay, what usually happened is that the way things will be explained to you on what you need to do had never be consistence, I mean ***d****ifferent version of the recommendation especially what to eat so when you will be told use this amount of that and take half of that you know things like that.* ***[Male 22, Hausa Type 1]***

*Sub-theme: Long waiting time (****n = 3****)*

Reference 7 - 0.27% Coverage

On the appointment day as you see just as the doctor also gives you appointment likewise he also did give other people appointment too. For you to be able to see the doctor when you come for your appointment you will seat down and be waiting till whenever you will be called. ***[Male24, Igbo Type 1]***

Reference 8 - 0.09% Coverage

[…] if you don't come earlier other people are already there so your number will be very far. ***[Female 24, Others Type 1]***

Reference 13 - 0.20% Coverage
appointment days since I live very far place I have to arrive in the hospital on time still I will have to wait on the cue you know this diabetes is not something we can just talk about only for one day. ***[Female 43, Others Type 2]***

*Sub-theme: difficulty in understanding (**n = 1**)*

Reference 1 - 0.27% Coverage
*when you go to the hospital , doctor will be telling me about these things you know that I should be doing and my problem is that I'm very slow to learn because of my level of education so seriously this diabetes issue, if you ask me I have not gotten myself till today. **[Male 24, Igbo Type 1]***

Theme five: Non-Adherence

<Internals\\Diabetic patient FG> - § 13 references coded [5.82% Coverage]

*Sub-theme: Self failure to compliance (**n = 4**)*

Reference 3 - 0.45% Coverage
*the few once i know I find it hard to keep them like as I said the other time I was tempted longer throat will not allow me, longer throat will not allow me so I will just say let me eat for today, today, today, after now then tomorrow I will not do it again. I have not being consistence in taking care of myself so I fail myself because of longer throat so changing from one lifestyle to another new lifestyle is hard that is a difficult thing that am facing. **[Female 24, Others Type 1]***

Reference 5 - 0.44% Coverage
*going to the hospital doctor will be giving me so many medications and then place me on things I will be doing and things I need or not supposed to be doing and after hearing from my doctor when you come back you will see temptations everywhere and you know me as a driver if I'm driving you will see some many things that will enter your eye to buy because you are hungry and then you will like to buy them and eat as to get energy to do your work. **[Male 24, Igbo Type 1]***

Reference 6 - 0.28% Coverage
*sometimes you know friends in school they will like calling me to go out with them you know Mr Biggs and […] things in Mr Biggs they will you know those things are attractive but at times I go with them take some of them I will say tomorrow I just take today, tomorrow maybe I won't take again. **[Female 23, Yoruba Type 1]***

Reference 12 - 0.41% Coverage
I find it so hard that I just don't change easily that is another side of my life anyway[…] and that burders me because the issue we are talking about it is a matter of life and death and I'm quite unhappy with that I mean my very kind of person. Like I still

*consciously go ahead some of the times in eating things that a diabetic patients shouldn't be eating and for me you know I don't know what is really wrong with me.****[Female 68, Others Type 2]***

Sub-theme: Failure to adherence due to financial constraint (n = 3)

Reference 7 - 0.36% Coverage
*I'm not really adhering to doctors ehm instruction, I'm not meeting up my medications expectation often times I get run short of my medications, because no money sometimes to buy so these are the things, and even some time you will not have transport money to come to the hospital because I live far away from this hospital you see when I don't have money to purchase my medications you know I will be so distressed at that point I know that anything can happen to me so in such a case I'm afraid [****Female 22, Hausa Type 1]***

Reference 9 - 0.35% Coverage
*This day this drugs are very expensive o the whole thing is so tiring, and I don't take my medication regularly because of how expensive the drugs are I don't usually afford it most of the times. Even I don't get things for my family and they do complain even my wife was telling me the other time that I don't use to buy her things when I'm coming back from work. [****Male 24, Igbo Type 1]***

Reference 11 - 0.40% Coverage
it is hard to really get fruit and vegetable and other healthy food […] they are too expensive all for me I really- really wished to take good care of my diabetes but I can't because I don't work no money, in fact I just live with whatever I see every blessed day of my life. You know this is really serious problem and I don't know how to go about what I think and was told to eat that would be helpful to my condition.

*Sub-theme: Difficulty of constant diet (****n = 2****)*

Reference 1 - 0.59% Coverage
[…] if I'm longing for a certain food, I don't stop myself from having it. I will indulge a little bit if I need to, because if you don't give yourself what you need or restricting yourself too much you will get worried and that make you a little emotional about it. You get worried being on a permeant diet you know; you have to have that meat-pia sometimes, and you need to go out with your friends and go to restaurant. Either you go out or you restrict yourself from everything and hate yourself to me it kind of making me feel apprehensive because is this what you will be living all days.

[Female 22, Hausa Type 1]

Reference 10 - 0.60% Coverage
I try to see that i meet up but it couldn't be easy, and that certain things am asked to avoid is an inconvenient to me that is why I'm telling you that this not a small illness, as I find it very difficult because it consumes money, it consumes energy as I said that is why thing are hard for me very had like when you are teaching a child ABCD, very-very hard that I cannot be able to meet up in things they ask me to avoid [...] things I use to eat for example from kids I started eating eba, fufu, and yam , but now I don't eat them only eating wheat that is a frustrating issue that so frustrating to me.

*Sub-theme: Failure to compliance due to forgetfulness (**n = 2**)*

Reference 2 - 0.55% Coverage

I know myself I have never -never anytime see that am really keeping emh in accordance with my taking care of my diabetes, yes I have failed myself several times and sometime I usually forget taking my medication in fact the other day I went to ehm what do they call it our child, marriage blessing in our church their they gave me maltina so I was hungry I have to take the maltina so these are the things I fail myself every time and the way am taking care of myself really is painful there is nothing is just like a-m-am I don't know how to go about it at times.
[Female 24, Others Type 1]

Reference 4 - 0.51% Coverage

I often time forgotten taking my medication and I will remember oh I have not taken my medication and by that time I might be in the lecture hall so coming back home to take my medication is so hard and apart from that when it come of adhering to doctor instructions I think I have failed myself greatly several of the times I will just say to myself today let me take this one then after today I wouldn't do that again but its seems as if I see myself doing this thing over and over so several times I have failed myself[...] I have different col ours of bags like today I will package this ehm my kits in a particular bag , then tomorrow because of the way I want to dress may be I will not carry that bag so I will forget so this are challenges like myself as a student is not really easy. ***[Female 22, Hausa Type 1]***

Theme six: Interpersonal Interaction and Isolation

<Internals\\Diabetic patient FG> - § 11 references coded [5.21% Coverage]

*Sub-theme: Rejection (**n = 3**)*

Reference 4 - 0.45% Coverage

you see me, do you know that the first time I came back with the result of diabetes I showed my husband, my husband say you're leaving this house today if not of God intervention that my husband left me in the house he want me to pack, send me packing, […] if not of my little kids were crying daddy don't do that, you see is so frustrating and annoying that your husband that married you will tell you to go out of the house because of one nonsense illness they call diabetes. ***[Female 24, Others Type 1]***

Reference 5 - 0.33% Coverage

diabetes is tiring I don't think you will really understand us because you are not in our shoe … even now are days I don't play ball with my team mate again like I use to do you know and people snubs me because I don't usually do the way I'm used to, I was a strong person before but this days I'm very clam person and people are still wondering. ***[Male 24, Igbo Type 1]***

Reference 8 - 0.54% Coverage

[…] I have to hide my condition by keeping it secretive so that nobody knows where husband will come from (she responded in-laughter- haha) I mean it and it is true because by exposing myself people will begin to ask questions ehm sweet heart what are you doing, and then I will be like I'm taking my medications or what can kind of illness are you suffering that you always take medicine you know I have hide myself not letting people know about it so is very dangerous if I do expose myself like that to people I don't want to be rejected. ***[Female 40, Igbo Type 2]***

*Sub-theme: Access to social role (**n = 2**)*

Reference 1 - 0.86% Coverage

I even stop not to be going to gathering […] for me i don't want people to know about it am trying to restrict myself I use to belong ehm this our age group mate you know as we are married in our marriage […] that is the way we do for people who comes from our culture, so I have to single myself out so that they wouldn't know am diabetic because every time they will ask me madam why you don't take mineral again when did you start stop taking mineral I will just be like no, I don't want them to know about it again instead let me stop to be involving myself in those gathering so that they wouldn't know what is happening, even in my maternal home too you know all these matrimonial home my sister in-law, mother-in-law they can talk, talk, talk so I hide myself and now I don't *want anybody to know so that if I hide myself a little from people ehm you know that will be better for me* ***[Female 24, Others Type 1]***

Reference 11 - 0.40% Coverage

[…] among social group and family responsibility that normally if not that I'm diabetic I think I would have being given most of the leading roles but because they see me as a weak person due the fact I usually complain that I'm tired because of my condition and this has even making some people to keep far away from me just imagine you going all through this because of diabetes it really upsetting I mean it.

*Sub-theme: Labeling (**n = 3**)*

Reference 6 - 0.78% Coverage

I 'm speaking on the aspect of what I did which I know is not helping but I got no option , to be honesty with you almost all my friends does not know I have diabetes, I have hid it from them.

MODERATOR PROBE: what is you reason for doing that?

I don't want to single myself out as a diabetic, that is I don't want people to see it as a weakness to me, you know to be diabetic most people don't understand what it is like my condition which was explained to me by the doctor I got it because my system failed to supplied insulin which is needed but it does not happened as a result of my habit so you know people got bad perception in fact they have this stigma of that you doesn't take care of yourself, that may be you eat whatever you want, so I don't want people to know that I'm a diabetic. ***[Female 22, Hausa Type 1]***

Reference 9 - 0.41% Coverage

*for me it not really easy to even come and expose myself like that and tell the whole world that you have diabetes […] even my visitations you know to the clinic I keep it secret, I use to go late when even I have appointment because people are already going, for me you just don't know what it look like exposing myself seating in the diabetic clinic and people sees me as diabetic I don't want to expose myself like that***.**

[Female 40, Igbo Type 2]

Reference 10 - 0.44% Coverage

being diabetes is a burdening issue because it all about tiredness that is it carry's tiredness and frustration, in fact where will you start where will you end all days… most of my friends who are hair dresser they are really strong in putting food on their *families table but myself where is the strength to do thing as I use to do this diabetes is just full of frustrating to me, also people will be seeing you as incapable unfit to take responsible* ***[Female 49, Igbo Type 2]***

*Sub-theme: Criticism (**n = 2**)*

Reference 2 - 0.32% Coverage
*If I allow them to know about my diabetes they will worsen my situation, they give frustration, I will not enjoy my marriage again they will be using my name to talk, talk, talk, talk ehm this one she is diabetic she will be eating all his husband money I don't want them know that is why sometimes I avoid them as to I hide it**.*** ***[Female 24, Others Type 1]***

Reference 3 - 0.35% Coverage

[…]my best the only friend I clam to have as a friend she notice that am a diabetic patient because she saw me some time taking insulin injection, do you know what she did any time we go for …mid night class to read this time around she start talking nonsense making jokes about my condition, you see I don't know just that is making me feel bad for myself, am really- really afraid she might also will be discussing my condition to others. ***[23, Yoruba Type 1]***

Theme Seven: Empowerment to self-Management

<Internals\\Diabetic patient FG> - § 9 references coded [2.60% Coverage]

*Sub-theme: Lack of Knowledge (**n = 2**)*

Reference 1 - 0.36% Coverage
when you have no knowledge on what to do especially when you needed such information that will disturbs you, so you know the whole thing just keep upsetting me as you don't know amount of food, I mean the one that has too much carbohydrate, so all I'm doing is what I think is okay which I might not be doing what is really needed to help my condition, I'm just like guessing. ***[Female 42, Hausa Type 2]***

Reference 3 - 0.25% Coverage
If you don't know how you will take care of yourself how will you be productive, you will not do anything and you will not be useful to yourself. This diabetes has really affected my life that has being you know the impact it has on my own personal life yes.
[Female 24, Others Type 1]

*Sub-theme: Failed expectation (**n = 5**)*

Reference 4 - 0.15% Coverage

[…] is very expensive so at times you be like this ehm disease they call diabetes should not be there again so that you will get yourself but this is not the case. ***[Female 24, Others Type 1]***

Reference 5 - 0.39% Coverage

I don't understand how I can do to manage my health, so because of this I don't want anything to do with being normal again like someday I wouldn't get out of bed, because of tiredness, some days I wouldn't even brush my hair and don't wash my face, and I never wore makeup I just don't care anymore for what is the essence of looking after yourself while you know nothing is improving in your condition.

[Female 22, Hausa Type 1]

Reference 7 - 0.28% Coverage

I would want to see that my sugar level becomes normal and balance but I cannot meet up, small time you will be told your sugar level has raise little time you will be told that it is low I don't know how I will make myself to see my sugar level be in order that is really burdening me. ***[Female 49, Igbo Type 2]***

Reference 8 - 0.43% Coverage

Living with this diabetes has changed my life in the ways I do not like and this is upsetting me, because I'm became more self-conscious and worried about letting people into my life. I have learned that I'm probably not as strong a person as I used to think I was. I used to think that I would be able to take anything, that you could throw anything at me and I could handle it. I don't think that anymore. I'm not the same person I used to be. ***[Female 40, Igbo Type 2]***

Reference 9 - 0.50% Coverage

It has all being a sad experience to be diabetic, you can't just believe that you are doing everything possible that you know is right for your life to be going well with diabetes still you see problems kept on coming over and over again then you will be like what next as there is actually nothing you've not done to your ability so tell me you got to prepare for the worst to happen this has being a big challenge for me so you see I feel like some days not even taking my medications after all what's the point.

[Female 68, Others, Type 2]

Theme Eight:Medication and regimen task

<Internals\\Diabetic patient FG> - § 4 references coded [2.38% Coverage]

Dissatisfaction of treatment options(**n = 3**)

Reference 1 - 0.31% Coverage
[…]from the day I was diagnosed with diabetes which the doctor told me that I would be on insulin probably throughout my life and I was sent home with some of the medications I feel so worried about the whole thing you know. Personally taking injection when I'm sick I usually find it very hard instead I prefer taking tablets.
[Female 42, Hausa Type 2]

Reference 2 - 0.62% Coverage
when I was told that I had to start injecting myself with insulin, In fact I refused to let anyone give me insulin except a trained Nurse because my parents was like asking me to go the chemist , each time I need to inject insulin I have to go to the chemist, not just of recently that I finally manage to give myself some insulin, and that was probably the hardest things I have ever had to do in my life giving myself an injection about three to four time a day it kind of a prison as I don't have any freedom again in my life. So many times i rather will take one or two noodle in a day because I have had so much piercing in my body. ***[Male 21, Yoruba Type 1]***

Reference 4 - 0.80% Coverage
*For me is hard to continue injecting myself insulin for the rest of my life that will be very terrible, so it worries me so much and another problem is that I cannot eat whatever I wanted because the food we have in Nigeria here you cannot able to measure the sugar content of carbohydrate and non-carbohydrate if not I would have just prefer to match this insulin injecting thing with just diet, you know the challenges in Nigeria to live with this diabetes is very hard unlike other developed country where they have break down of the quality and content of food you can be eating. But this one you will just be doing the mathematic by yourself which is all trying by error. You have no alternative on other ways apart from just living the whole day in injecting insulin; you see this is scaring and serious issue for me.****[Male 22, Hausa Type 1]***

APPENDIX: G

THE RESEARCHER DISCUSSING WITH THE PATIENTS DURING ONE OF THE FOCUS GROUP INTERVIEWS

APPENDIX: H

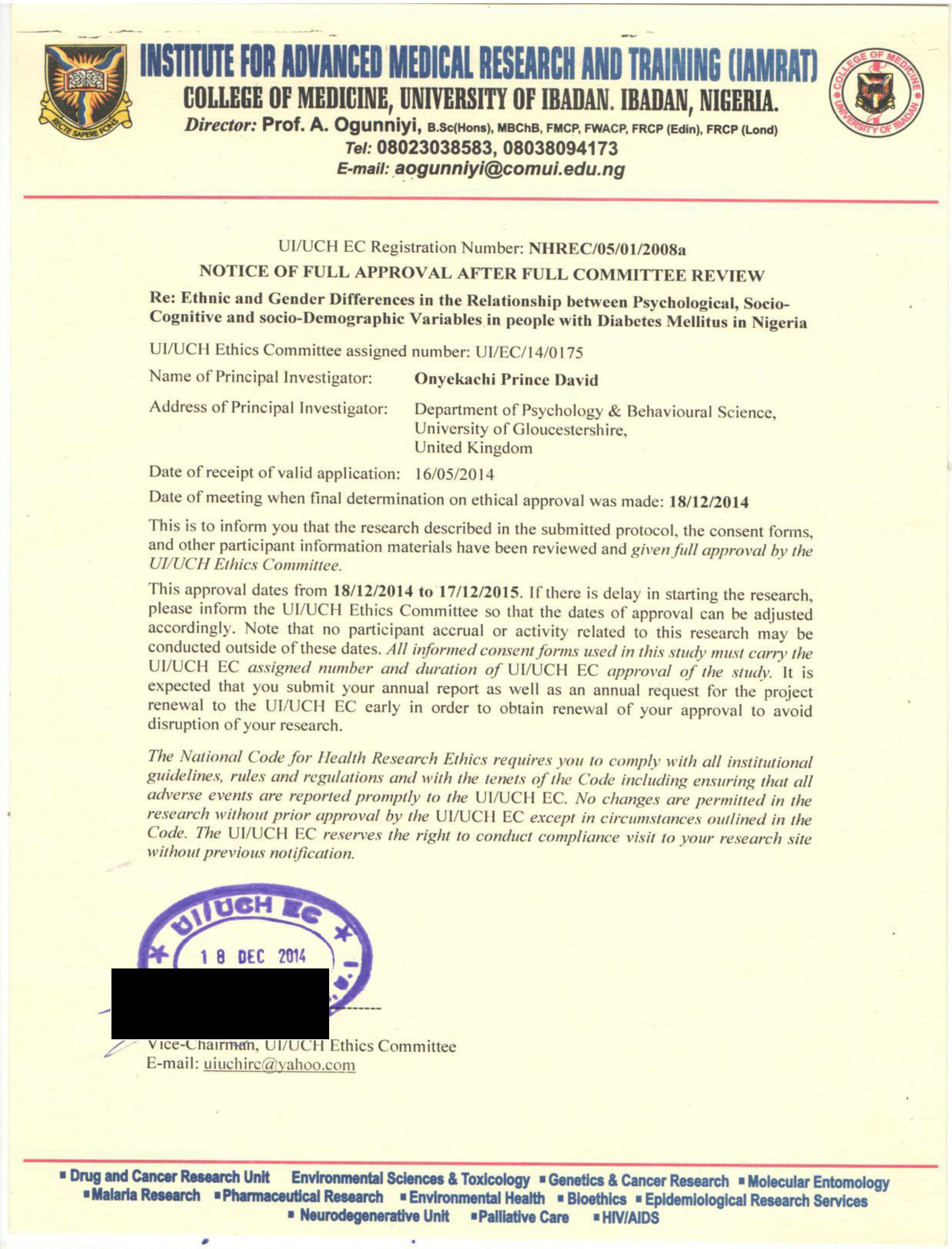
PICTURES OF THE FOUR PARTICIPATED SITE FOR THE STUDY


UNIVERSITY OF PORT HARCOURT TEACHING HOSPITAL
19/09/2014


UNIVERSITY OF BENIN
TEACHING HOSPITAL
P.M.B. 1111,
Benin City,
Edo State, Nigeria
website: www.ubth.org
03/10/2014


UNIVERSITY COLLEGE HOSPITAL, IBADAN
HOSPITAL, IBAD
ION CENTR
EN 24 HRS
14/10/2014

APPENDIX: I



INSTITUTE FOR ADVANCED MEDICAL RESEARCH AND TRAINING (IAMRAT)
COLLEGE OF MEDICINE, UNIVERSITY OF IBADAN. IBADAN, NIGERIA.
Director: **Prof. A. Ogunniyi,** B.Sc(Hons), MBChB, FMCP, FWACP, FRCP (Edin), FRCP (Lond)
Tel: **08023038583, 08038094173**
E-mail: ***aogunniyi@comui.edu.ng***

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

NOTICE OF FULL APPROVAL AFTER FULL COMMITTEE REVIEW

Re: Ethnic and Gender Differences in the Relationship between Psychological, Socio-Cognitive and socio-Demographic Variables in people with Diabetes Mellitus in Nigeria

UI/UCH Ethics Committee assigned number: UI/EC/14/0175

Name of Principal Investigator:	**Onyekachi Prince David**
Address of Principal Investigator:	Department of Psychology & Behavioural Science, University of Gloucestershire, United Kingdom
Date of receipt of valid application:	16/05/2014

Date of meeting when final determination on ethical approval was made: **18/12/2014**

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

This approval dates from **18/12/2014 to 17/12/2015**. If there is delay in starting the research, please inform the UI/UCH Ethics Committee so that the dates of approval can be adjusted accordingly. Note that no participant accrual or activity related to this research may be conducted outside of these dates. *All informed consent forms used in this study must carry the* UI/UCH EC *assigned number and duration of* UI/UCH EC *approval of the study.* It is expected that you submit your annual report as well as an annual request for the project renewal to the UI/UCH EC early in order to obtain renewal of your approval to avoid disruption of your research.

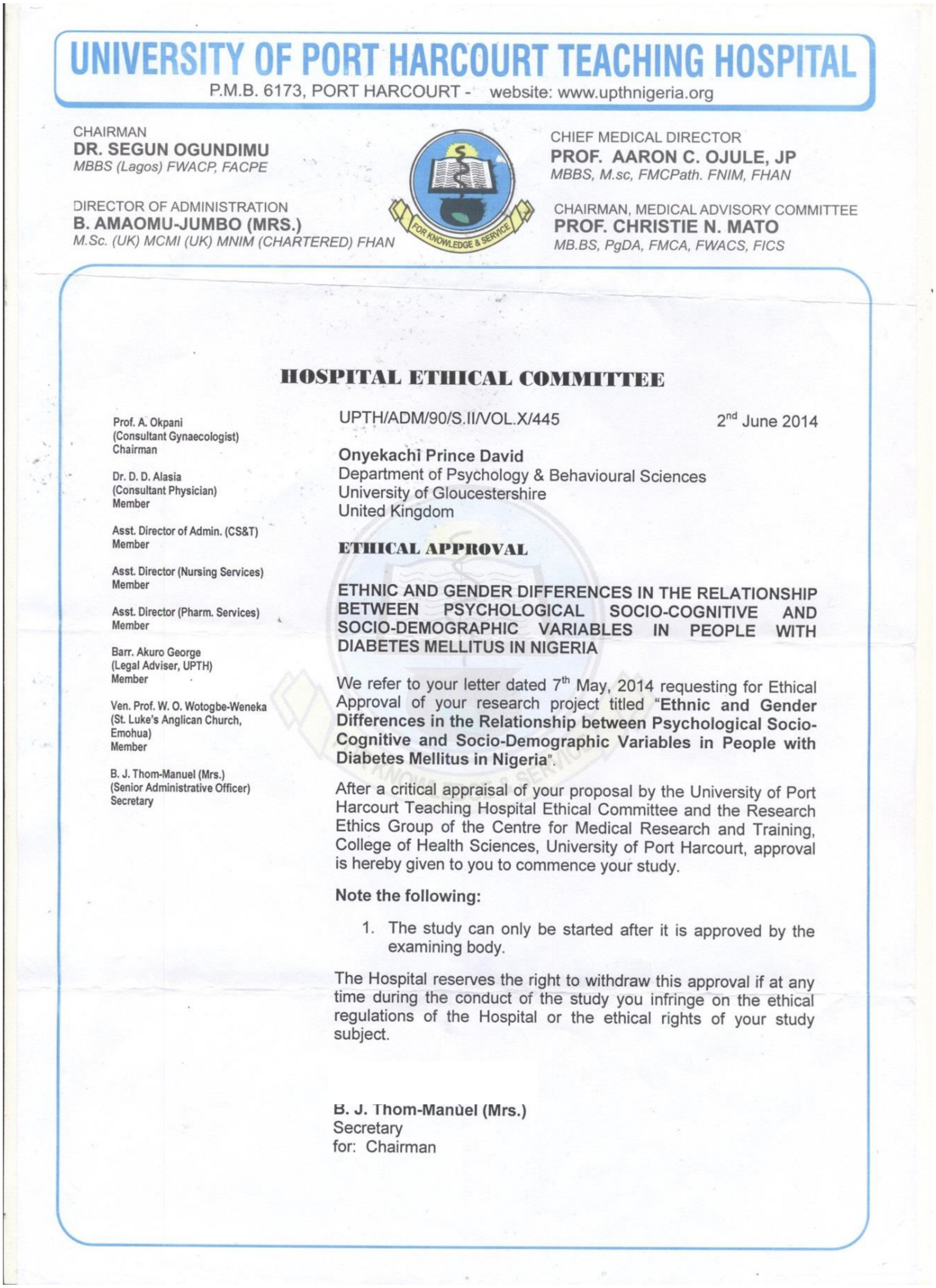
The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the UI/UCH EC. *No changes are permitted in the research without prior approval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

UI/UCH EC
18 DEC 2014

[redacted]

Vice-Chairman, UI/UCH Ethics Committee
E-mail: uiuchirc@yahoo.com

▪ Drug and Cancer Research Unit Environmental Sciences & Toxicology ▪ Genetics & Cancer Research ▪ Molecular Entomology ▪ Malaria Research ▪ Pharmaceutical Research ▪ Environmental Health ▪ Bioethics ▪ Epidemiological Research Services ▪ Neurodegenerative Unit ▪ Palliative Care ▪ HIV/AIDS



UNIVERSITY OF PORT HARCOURT TEACHING HOSPITAL
P.M.B. 6173, PORT HARCOURT - website: www.upthnigeria.org

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MBBS (Lagos) FWACP, FACPE

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PROF. CHRISTIE N. MATO
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(Consultant Gynaecologist)
Chairman

Dr. D. D. Alasia
(Consultant Physician)
Member

Asst. Director of Admin. (CS&T)
Member

Asst. Director (Nursing Services)
Member

Asst. Director (Pharm. Services)
Member

Barr. Akuro George
(Legal Adviser, UPTH)
Member

Ven. Prof. W. O. Wotogbe-Weneka
(St. Luke's Anglican Church,
Emohua)
Member

B. J. Thom-Manuel (Mrs.)
(Senior Administrative Officer)
Secretary

UPTH/ADM/90/S.II/VOL.X/445 2nd June 2014

Onyekachi Prince David
Department of Psychology & Behavioural Sciences
University of Gloucestershire
United Kingdom

ETHICAL APPROVAL

ETHNIC AND GENDER DIFFERENCES IN THE RELATIONSHIP BETWEEN PSYCHOLOGICAL SOCIO-COGNITIVE AND SOCIO-DEMOGRAPHIC VARIABLES IN PEOPLE WITH DIABETES MELLITUS IN NIGERIA

We refer to your letter dated 7th May, 2014 requesting for Ethical Approval of your research project titled "**Ethnic and Gender Differences in the Relationship between Psychological Socio-Cognitive and Socio-Demographic Variables in People with Diabetes Mellitus in Nigeria**".

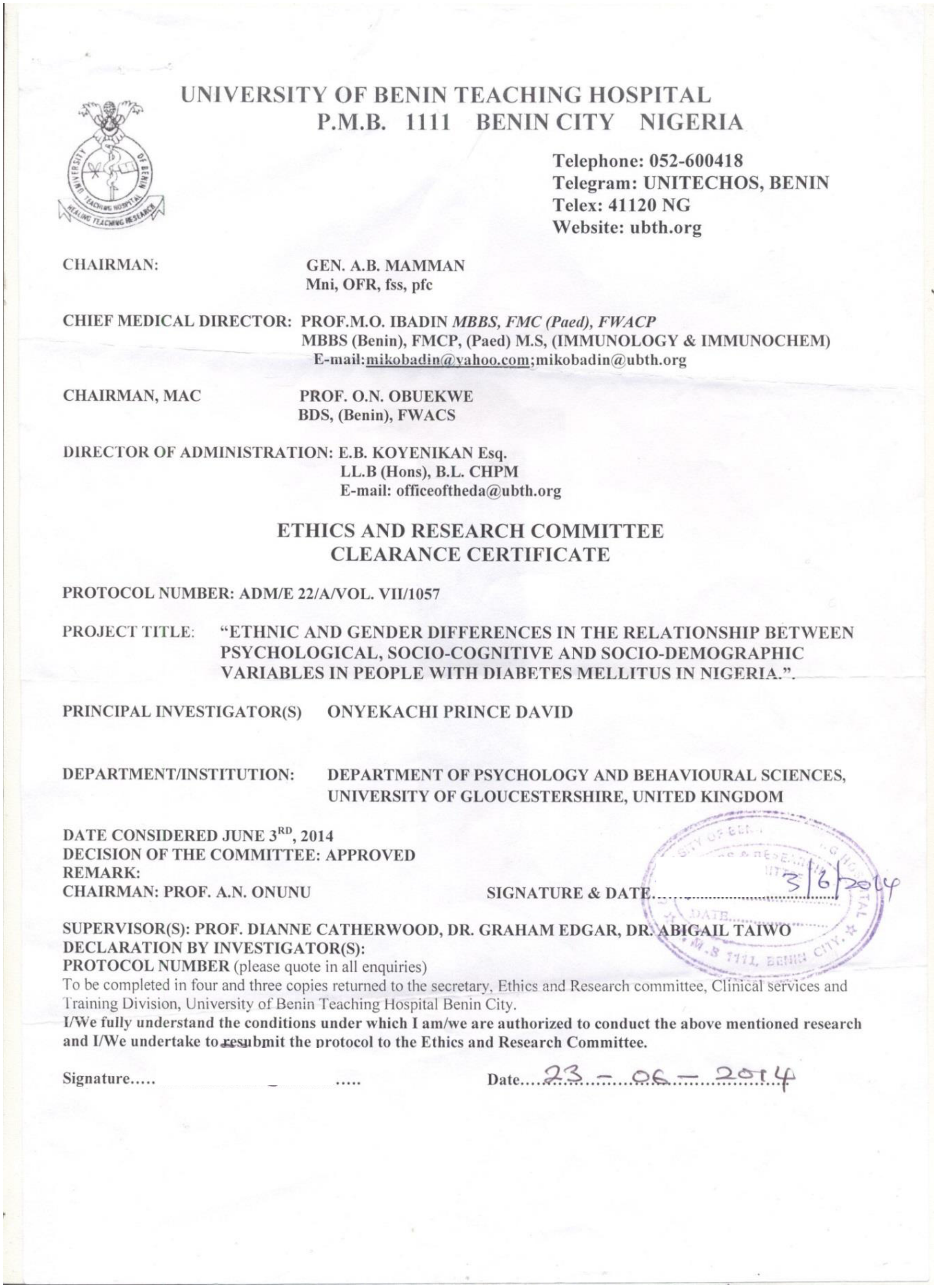
After a critical appraisal of your proposal by the University of Port Harcourt Teaching Hospital Ethical Committee and the Research Ethics Group of the Centre for Medical Research and Training, College of Health Sciences, University of Port Harcourt, approval is hereby given to you to commence your study.

Note the following:

1. The study can only be started after it is approved by the examining body.

The Hospital reserves the right to withdraw this approval if at any time during the conduct of the study you infringe on the ethical regulations of the Hospital or the ethical rights of your study subject.

B. J. Thom-Manuel (Mrs.)
Secretary
for: Chairman



UNIVERSITY OF BENIN TEACHING HOSPITAL
P.M.B. 1111 BENIN CITY NIGERIA

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Mni, OFR, fss, pfc

CHIEF MEDICAL DIRECTOR: PROF.M.O. IBADIN *MBBS, FMC (Paed), FWACP*
MBBS (Benin), FMCP, (Paed) M.S, (IMMUNOLOGY & IMMUNOCHEM)
E-mail:mikobadin@yahoo.com;mikobadin@ubth.org

CHAIRMAN, MAC PROF. O.N. OBUEKWE
BDS, (Benin), FWACS

DIRECTOR OF ADMINISTRATION: E.B. KOYENIKAN Esq.
LL.B (Hons), B.L. CHPM
E-mail: officeoftheda@ubth.org

ETHICS AND RESEARCH COMMITTEE CLEARANCE CERTIFICATE

PROTOCOL NUMBER: ADM/E 22/A/VOL. VII/1057

PROJECT TITLE: **"ETHNIC AND GENDER DIFFERENCES IN THE RELATIONSHIP BETWEEN PSYCHOLOGICAL, SOCIO-COGNITIVE AND SOCIO-DEMOGRAPHIC VARIABLES IN PEOPLE WITH DIABETES MELLITUS IN NIGERIA.".**

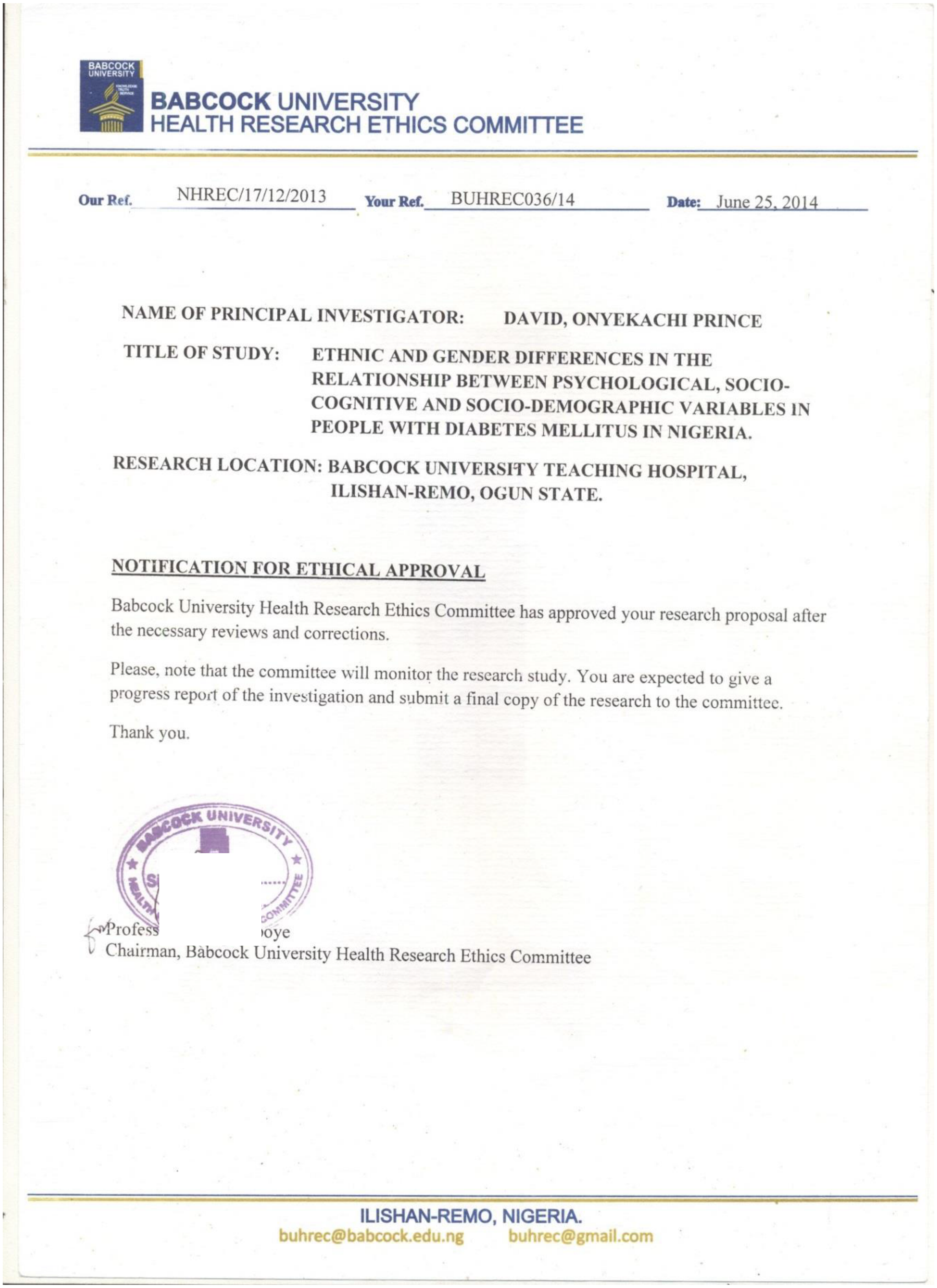
PRINCIPAL INVESTIGATOR(S) **ONYEKACHI PRINCE DAVID**

DEPARTMENT/INSTITUTION: **DEPARTMENT OF PSYCHOLOGY AND BEHAVIOURAL SCIENCES, UNIVERSITY OF GLOUCESTERSHIRE, UNITED KINGDOM**

DATE CONSIDERED JUNE 3RD, 2014
DECISION OF THE COMMITTEE: APPROVED
REMARK:
CHAIRMAN: PROF. A.N. ONUNU **SIGNATURE & DATE**........3/6/2014

SUPERVISOR(S): PROF. DIANNE CATHERWOOD, DR. GRAHAM EDGAR, DR. ABIGAIL TAIWO
DECLARATION BY INVESTIGATOR(S):
PROTOCOL NUMBER (please quote in all enquiries)
To be completed in four and three copies returned to the secretary, Ethics and Research committee, Clinical services and Training Division, University of Benin Teaching Hospital Benin City.
I/We fully understand the conditions under which I am/we are authorized to conduct the above mentioned research and I/We undertake to resubmit the protocol to the Ethics and Research Committee.

Signature..... ..... **Date**...23 - 06 - 2014



BABCOCK UNIVERSITY
HEALTH RESEARCH ETHICS COMMITTEE

Our Ref. NHREC/17/12/2013 **Your Ref.** BUHREC036/14 **Date:** June 25, 2014

NAME OF PRINCIPAL INVESTIGATOR: **DAVID, ONYEKACHI PRINCE**

TITLE OF STUDY: **ETHNIC AND GENDER DIFFERENCES IN THE RELATIONSHIP BETWEEN PSYCHOLOGICAL, SOCIO-COGNITIVE AND SOCIO-DEMOGRAPHIC VARIABLES IN PEOPLE WITH DIABETES MELLITUS IN NIGERIA.**

RESEARCH LOCATION: **BABCOCK UNIVERSITY TEACHING HOSPITAL, ILISHAN-REMO, OGUN STATE.**

NOTIFICATION FOR ETHICAL APPROVAL

Babcock University Health Research Ethics Committee has approved your research proposal after the necessary reviews and corrections.

Please, note that the committee will monitor the research study. You are expected to give a progress report of the investigation and submit a final copy of the research to the committee.

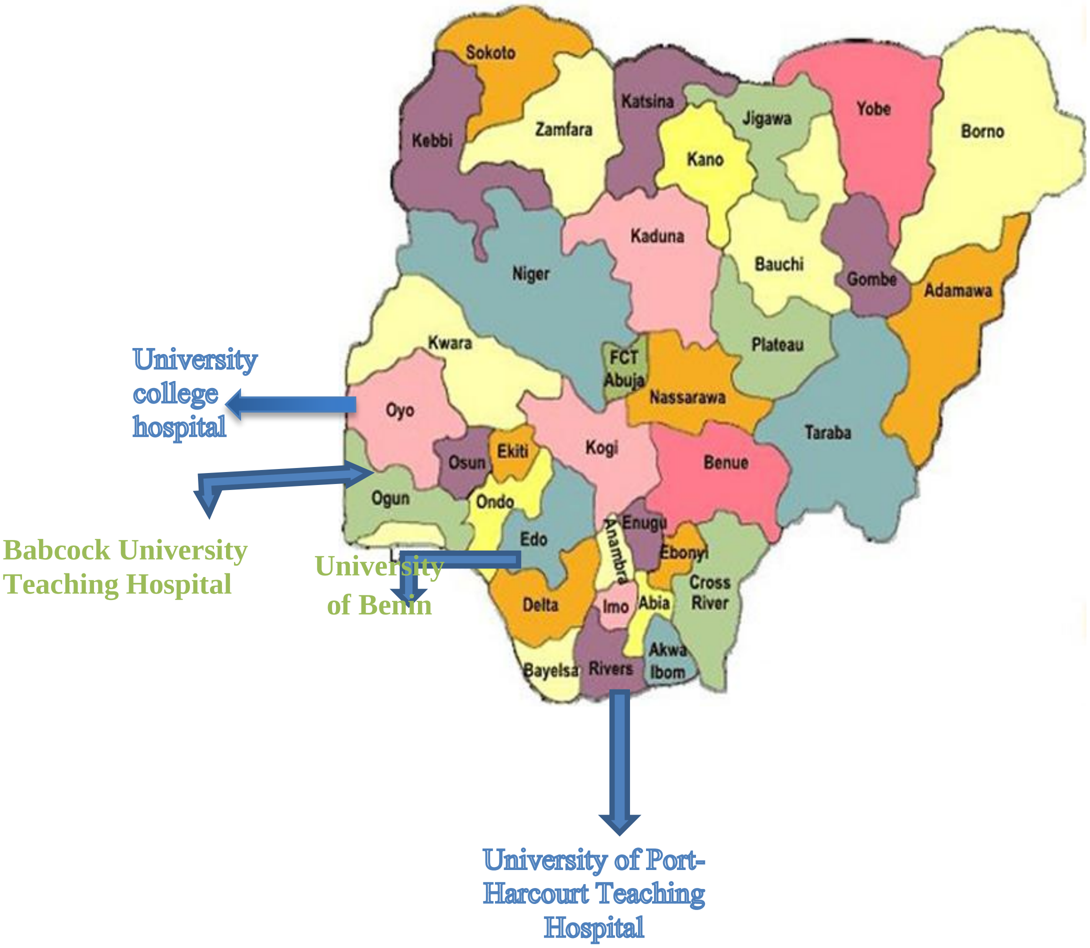
Thank you.

Profess[redacted]oye
Chairman, Babcock University Health Research Ethics Committee

ILISHAN-REMO, NIGERIA.
buhrec@babcock.edu.ng buhrec@gmail.com

APPENDIX: J

Map of Nigeria



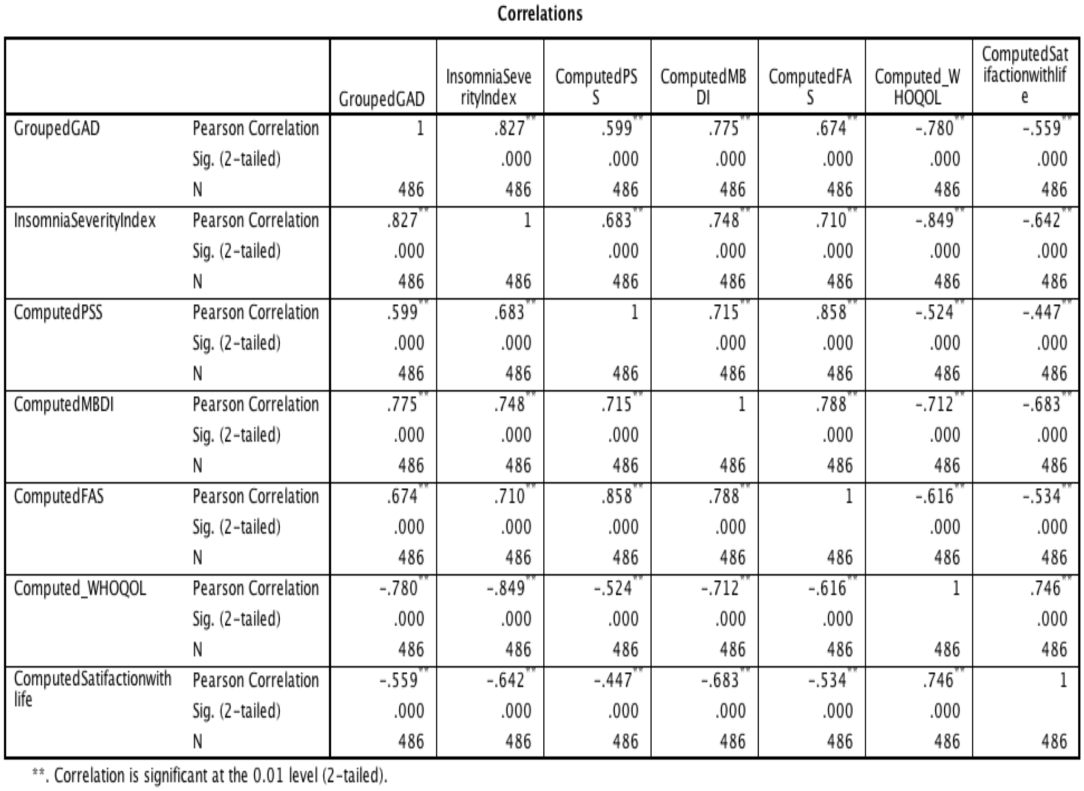
University college hospital

Babcock University Teaching Hospital

University of Benin

University of Port-Harcourt Teaching Hospital

APPENDIX: K
MANOVA ASSUMPTIONS FOR THE HYPOTHESIS TWO ON PSYCHOLOGICAL HEALTH (DVs)



Correlations

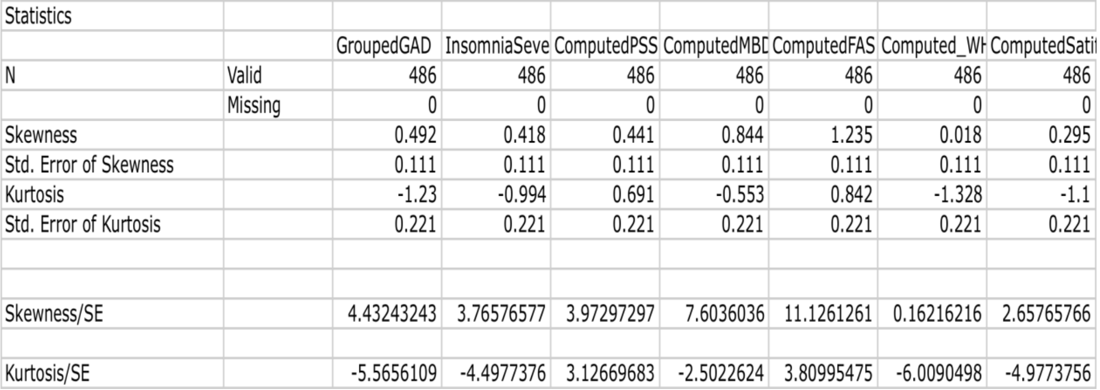
		GroupedGAD	InsomniaSeverityIndex	ComputedPSS	ComputedMBDI	ComputedFAS	Computed_WHOQOL	ComputedSatifactionwithlife
GroupedGAD	Pearson Correlation	1	.827**	.599**	.775**	.674**	-.780**	-.559**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000
	N	486	486	486	486	486	486	486
InsomniaSeverityIndex	Pearson Correlation	.827**	1	.683**	.748**	.710**	-.849**	-.642**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
	N	486	486	486	486	486	486	486
ComputedPSS	Pearson Correlation	.599**	.683**	1	.715**	.858**	-.524**	-.447**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000
	N	486	486	486	486	486	486	486
ComputedMBDI	Pearson Correlation	.775**	.748**	.715**	1	.788**	-.712**	-.683**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000
	N	486	486	486	486	486	486	486
ComputedFAS	Pearson Correlation	.674**	.710**	.858**	.788**	1	-.616**	-.534**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000
	N	486	486	486	486	486	486	486
Computed_WHOQOL	Pearson Correlation	-.780**	-.849**	-.524**	-.712**	-.616**	1	.746**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000
	N	486	486	486	486	486	486	486
ComputedSatifactionwithlife	Pearson Correlation	-.559**	-.642**	-.447**	-.683**	-.534**	.746**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
	N	486	486	486	486	486	486	486

**. Correlation is significant at the 0.01 level (2-tailed).

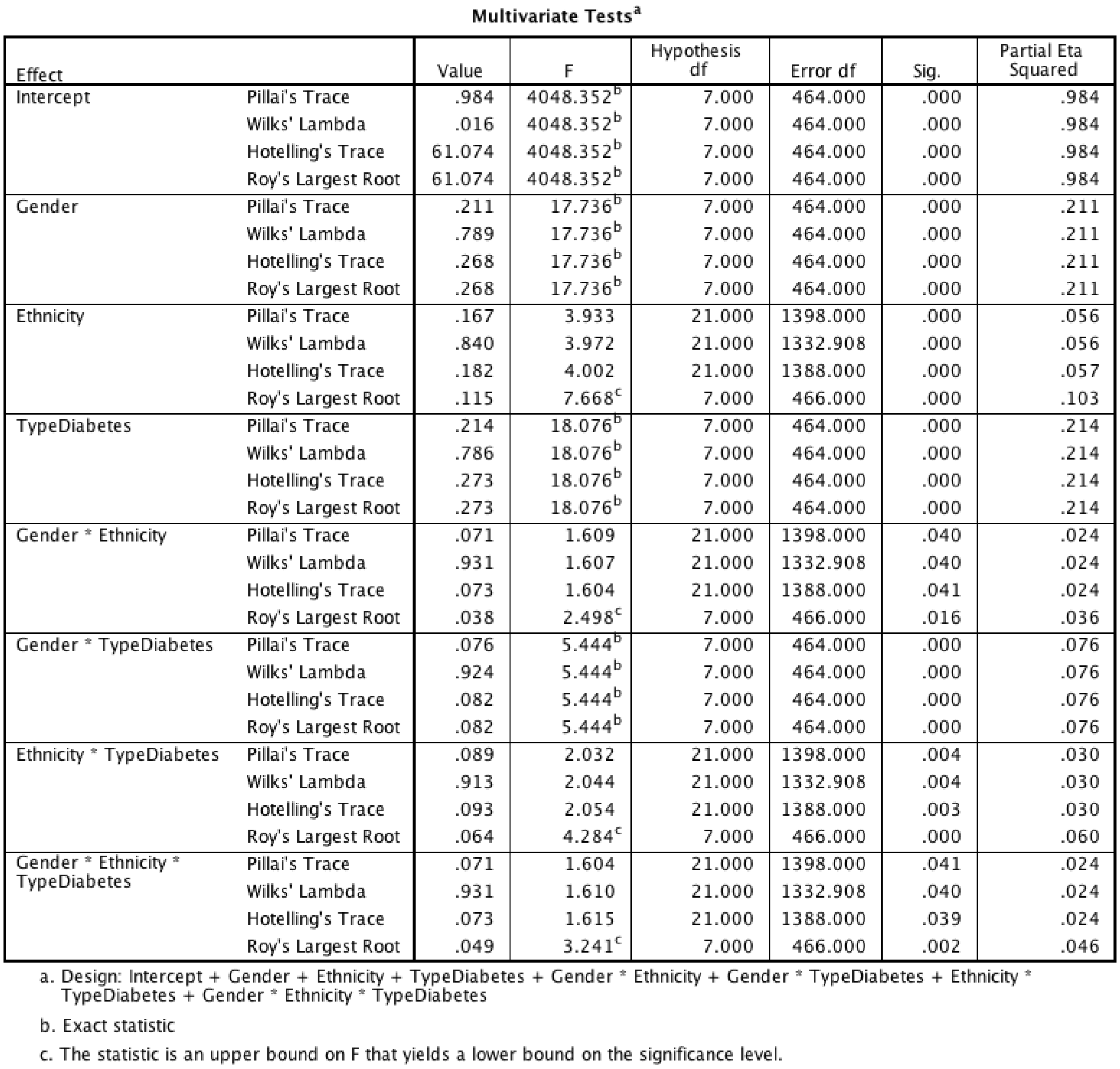
Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
GroupedGAD	8.893	15	470	.000
InsomniaSeverityIndex	5.588	15	470	.000
ComputedPSS	6.692	15	470	.000
ComputedMBDI	10.990	15	470	.000
ComputedFAS	11.492	15	470	.000
Computed_WHOQOL	5.666	15	470	.000
ComputedSatifactionwithlife	3.562	15	470	.000

a. Design: Intercept + Gender + Ethnicity + TypeDiabetes + Gender * Ethnicity + Gender * TypeDiabetes + Ethnicity * TypeDiabetes + Gender * Ethnicity * TypeDiabetes



Statistics								
		GroupedGAD	InsomniaSeve	ComputedPSS	ComputedMBD	ComputedFAS	Computed_WH	ComputedSati
N	Valid	486	486	486	486	486	486	486
	Missing	0	0	0	0	0	0	0
Skewness		0.492	0.418	0.441	0.844	1.235	0.018	0.295
Std. Error of Skewness		0.111	0.111	0.111	0.111	0.111	0.111	0.111
Kurtosis		-1.23	-0.994	0.691	-0.553	0.842	-1.328	-1.1
Std. Error of Kurtosis		0.221	0.221	0.221	0.221	0.221	0.221	0.221
Skewness/SE		4.43243243	3.76576577	3.97297297	7.6036036	11.1261261	0.16216216	2.65765766
Kurtosis/SE		-5.5656109	-4.4977376	3.12669683	-2.5022624	3.80995475	-6.0090498	-4.9773756



Multivariate Tests[a]

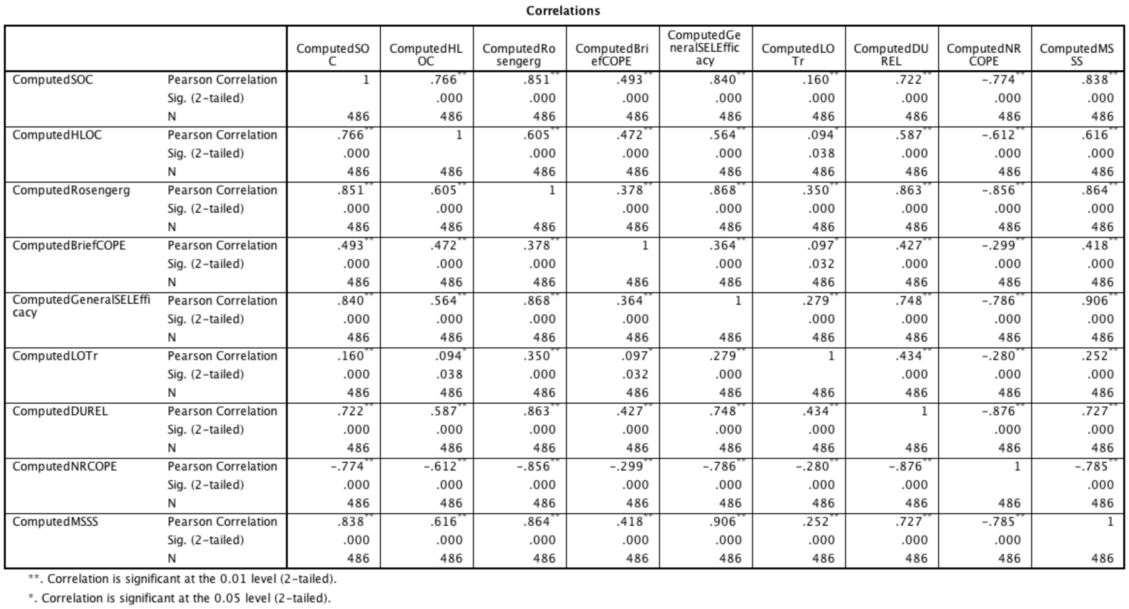
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.984	4048.352[b]	7.000	464.000	.000	.984
	Wilks' Lambda	.016	4048.352[b]	7.000	464.000	.000	.984
	Hotelling's Trace	61.074	4048.352[b]	7.000	464.000	.000	.984
	Roy's Largest Root	61.074	4048.352[b]	7.000	464.000	.000	.984
Gender	Pillai's Trace	.211	17.736[b]	7.000	464.000	.000	.211
	Wilks' Lambda	.789	17.736[b]	7.000	464.000	.000	.211
	Hotelling's Trace	.268	17.736[b]	7.000	464.000	.000	.211
	Roy's Largest Root	.268	17.736[b]	7.000	464.000	.000	.211
Ethnicity	Pillai's Trace	.167	3.933	21.000	1398.000	.000	.056
	Wilks' Lambda	.840	3.972	21.000	1332.908	.000	.056
	Hotelling's Trace	.182	4.002	21.000	1388.000	.000	.057
	Roy's Largest Root	.115	7.668[c]	7.000	466.000	.000	.103
TypeDiabetes	Pillai's Trace	.214	18.076[b]	7.000	464.000	.000	.214
	Wilks' Lambda	.786	18.076[b]	7.000	464.000	.000	.214
	Hotelling's Trace	.273	18.076[b]	7.000	464.000	.000	.214
	Roy's Largest Root	.273	18.076[b]	7.000	464.000	.000	.214
Gender * Ethnicity	Pillai's Trace	.071	1.609	21.000	1398.000	.040	.024
	Wilks' Lambda	.931	1.607	21.000	1332.908	.040	.024
	Hotelling's Trace	.073	1.604	21.000	1388.000	.041	.024
	Roy's Largest Root	.038	2.498[c]	7.000	466.000	.016	.036
Gender * TypeDiabetes	Pillai's Trace	.076	5.444[b]	7.000	464.000	.000	.076
	Wilks' Lambda	.924	5.444[b]	7.000	464.000	.000	.076
	Hotelling's Trace	.082	5.444[b]	7.000	464.000	.000	.076
	Roy's Largest Root	.082	5.444[b]	7.000	464.000	.000	.076
Ethnicity * TypeDiabetes	Pillai's Trace	.089	2.032	21.000	1398.000	.004	.030
	Wilks' Lambda	.913	2.044	21.000	1332.908	.004	.030
	Hotelling's Trace	.093	2.054	21.000	1388.000	.003	.030
	Roy's Largest Root	.064	4.284[c]	7.000	466.000	.000	.060
Gender * Ethnicity * TypeDiabetes	Pillai's Trace	.071	1.604	21.000	1398.000	.041	.024
	Wilks' Lambda	.931	1.610	21.000	1332.908	.040	.024
	Hotelling's Trace	.073	1.615	21.000	1388.000	.039	.024
	Roy's Largest Root	.049	3.241[c]	7.000	466.000	.002	.046

a. Design: Intercept + Gender + Ethnicity + TypeDiabetes + Gender * Ethnicity + Gender * TypeDiabetes + Ethnicity * TypeDiabetes + Gender * Ethnicity * TypeDiabetes

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

MANOVA ASSUMPTION FOR THE HYPOTHESIS THREE ON SOCIO COGNITIVE (DVs)

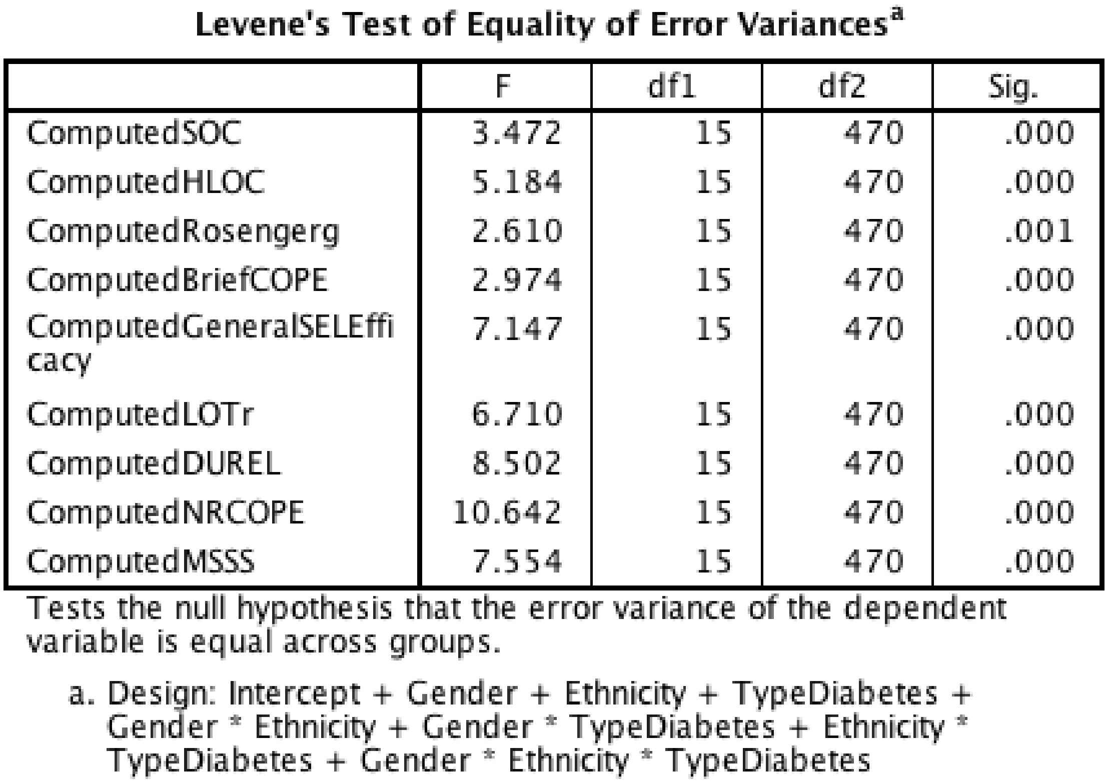


Correlations

		ComputedSOC	ComputedHLOC	ComputedRosengerg	ComputedBriefCOPE	ComputedGeneralSELEfficacy	ComputedLOTr	ComputedDUREL	ComputedNRCOPE	ComputedMSSS
ComputedSOC	Pearson Correlation	1	.766**	.851**	.493**	.840**	.160**	.722**	-.774**	.838**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000
	N	486	486	486	486	486	486	486	486	486
ComputedHLOC	Pearson Correlation	.766**	1	.605**	.472**	.564**	.094*	.587**	-.612**	.616**
	Sig. (2-tailed)	.000		.000	.000	.000	.038	.000	.000	.000
	N	486	486	486	486	486	486	486	486	486
ComputedRosengerg	Pearson Correlation	.851**	.605**	1	.378**	.868**	.350**	.863**	-.856**	.864**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000
	N	486	486	486	486	486	486	486	486	486
ComputedBriefCOPE	Pearson Correlation	.493**	.472**	.378**	1	.364**	.097*	.427**	-.299**	.418**
	Sig. (2-tailed)	.000	.000	.000		.000	.032	.000	.000	.000
	N	486	486	486	486	486	486	486	486	486
ComputedGeneralSELEfficacy	Pearson Correlation	.840**	.564**	.868**	.364**	1	.279**	.748**	-.786**	.906**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000
	N	486	486	486	486	486	486	486	486	486
ComputedLOTr	Pearson Correlation	.160**	.094*	.350**	.097*	.279**	1	.434**	-.280**	.252**
	Sig. (2-tailed)	.000	.038	.000	.032	.000		.000	.000	.000
	N	486	486	486	486	486	486	486	486	486
ComputedDUREL	Pearson Correlation	.722**	.587**	.863**	.427**	.748**	.434**	1	-.876**	.727**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000
	N	486	486	486	486	486	486	486	486	486
ComputedNRCOPE	Pearson Correlation	-.774**	-.612**	-.856**	-.299**	-.786**	-.280**	-.876**	1	-.785**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000
	N	486	486	486	486	486	486	486	486	486
ComputedMSSS	Pearson Correlation	.838**	.616**	.864**	.418**	.906**	.252**	.727**	-.785**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	
	N	486	486	486	486	486	486	486	486	486

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

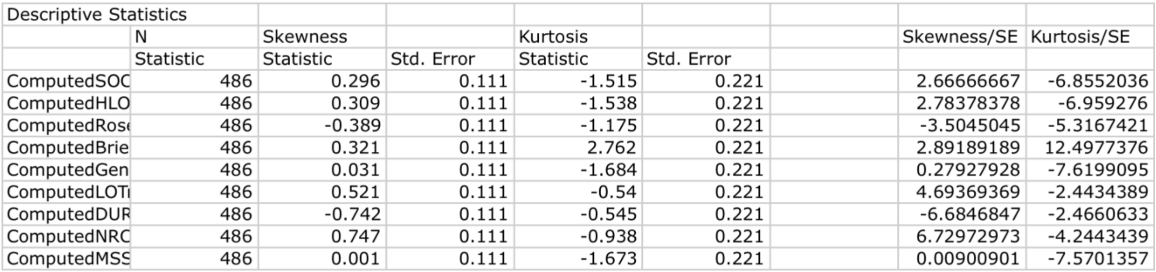


Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
ComputedSOC	3.472	15	470	.000
ComputedHLOC	5.184	15	470	.000
ComputedRosengerg	2.610	15	470	.001
ComputedBriefCOPE	2.974	15	470	.000
ComputedGeneralSELEfficacy	7.147	15	470	.000
ComputedLOTr	6.710	15	470	.000
ComputedDUREL	8.502	15	470	.000
ComputedNRCOPE	10.642	15	470	.000
ComputedMSSS	7.554	15	470	.000

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Gender + Ethnicity + TypeDiabetes + Gender * Ethnicity + Gender * TypeDiabetes + Ethnicity * TypeDiabetes + Gender * Ethnicity * TypeDiabetes



Descriptive Statistics								
	N	Skewness		Kurtosis			Skewness/SE	Kurtosis/SE
	Statistic	Statistic	Std. Error	Statistic	Std. Error			
ComputedSOC	486	0.296	0.111	-1.515	0.221		2.66666667	-6.8552036
ComputedHLO	486	0.309	0.111	-1.538	0.221		2.78378378	-6.959276
ComputedRos	486	-0.389	0.111	-1.175	0.221		-3.5045045	-5.3167421
ComputedBrie	486	0.321	0.111	2.762	0.221		2.89189189	12.4977376
ComputedGen	486	0.031	0.111	-1.684	0.221		0.27927928	-7.6199095
ComputedLOT	486	0.521	0.111	-0.54	0.221		4.69369369	-2.4434389
ComputedDUR	486	-0.742	0.111	-0.545	0.221		-6.6846847	-2.4660633
ComputedNRC	486	0.747	0.111	-0.938	0.221		6.72972973	-4.2443439
ComputedMSS	486	0.001	0.111	-1.673	0.221		0.00900901	-7.5701357

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.987	3845.177[b]	9.000	462.000	.000	.987
	Wilks' Lambda	.013	3845.177[b]	9.000	462.000	.000	.987
	Hotelling's Trace	74.906	3845.177[b]	9.000	462.000	.000	.987
	Roy's Largest Root	74.906	3845.177[b]	9.000	462.000	.000	.987
Gender	Pillai's Trace	.133	7.844[b]	9.000	462.000	.000	.133
	Wilks' Lambda	.867	7.844[b]	9.000	462.000	.000	.133
	Hotelling's Trace	.153	7.844[b]	9.000	462.000	.000	.133
	Roy's Largest Root	.153	7.844[b]	9.000	462.000	.000	.133
Ethnicity	Pillai's Trace	.194	3.557	27.000	1392.000	.000	.065
	Wilks' Lambda	.814	3.641	27.000	1349.921	.000	.066
	Hotelling's Trace	.218	3.722	27.000	1382.000	.000	.068
	Roy's Largest Root	.163	8.417[c]	9.000	464.000	.000	.140
TypeDiabetes	Pillai's Trace	.201	12.896[b]	9.000	462.000	.000	.201
	Wilks' Lambda	.799	12.896[b]	9.000	462.000	.000	.201
	Hotelling's Trace	.251	12.896[b]	9.000	462.000	.000	.201
	Roy's Largest Root	.251	12.896[b]	9.000	462.000	.000	.201
Gender * Ethnicity	Pillai's Trace	.127	2.286	27.000	1392.000	.000	.042
	Wilks' Lambda	.877	2.289	27.000	1349.921	.000	.043
	Hotelling's Trace	.134	2.290	27.000	1382.000	.000	.043
	Roy's Largest Root	.070	3.634[c]	9.000	464.000	.000	.066
Gender * TypeDiabetes	Pillai's Trace	.048	2.599[b]	9.000	462.000	.006	.048
	Wilks' Lambda	.952	2.599[b]	9.000	462.000	.006	.048
	Hotelling's Trace	.051	2.599[b]	9.000	462.000	.006	.048
	Roy's Largest Root	.051	2.599[b]	9.000	462.000	.006	.048
Ethnicity * TypeDiabetes	Pillai's Trace	.098	1.748	27.000	1392.000	.010	.033
	Wilks' Lambda	.903	1.770	27.000	1349.921	.009	.033
	Hotelling's Trace	.105	1.792	27.000	1382.000	.008	.034
	Roy's Largest Root	.083	4.298[c]	9.000	464.000	.000	.077
Gender * Ethnicity * TypeDiabetes	Pillai's Trace	.135	2.426	27.000	1392.000	.000	.045
	Wilks' Lambda	.870	2.445	27.000	1349.921	.000	.045
	Hotelling's Trace	.144	2.462	27.000	1382.000	.000	.046
	Roy's Largest Root	.095	4.894[c]	9.000	464.000	.000	.087

a. Design: Intercept + Gender + Ethnicity + TypeDiabetes + Gender * Ethnicity + Gender * TypeDiabetes + Ethnicity * TypeDiabetes + Gender * Ethnicity * TypeDiabetes

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.