

SCHOOL OF NURSING AND MIDWIFERY

COLLEGE OF HEALTH SCIENCES

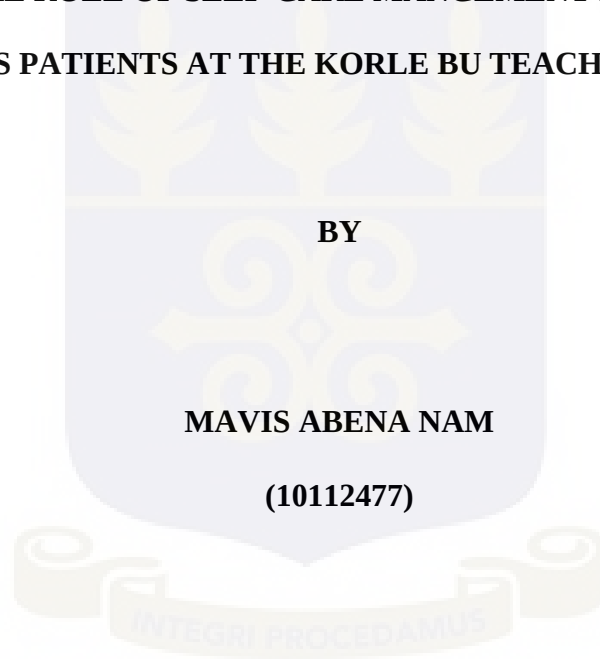
UNIVERSITY OF GHANA, LEGON

**EXAMINING THE ROLE OF SELF-CARE MANGEMENT IN TYPE 2 DIABETES
MELLITUS PATIENTS AT THE KORLE BU TEACHING HOSPITAL**

BY

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**THIS THESIS/ DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF
GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR
THE AWARD OF MPhil NURSING DEGREE**

JULY, 2017



DECLARATION

I, Mavis Abena Nam do hereby declare that this thesis is a record of my own research work.

None of the materials in this write up has been presented either in whole or in part to any other institution for the award of any degree or certificate. References made to the works of other researchers and authors have been duly acknowledged.

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We hereby do certify that the preparation of this thesis was supervised in accordance with the guidelines on supervision of thesis laid down by the University of Ghana.

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DEDICATION

I dedicate this work to the Almighty God for His banner of love over me. Also to my father Mr. Emmanuel Kofi Nam of blessed memory and my husband Mr. Dennis Ehiakpor for having confidence in me and inspired me to pursue this programme.



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TABLE OF CONTENT

Contents

DECLARATION	i
DEDICATION	ii
ACKNOWLEDGEMENT	iii
LIST OF TABLES.....	vii
LIST OF FIGURES	viii
ABSTRACT	xi
CHAPTER ONE.....	1
INTRODUCTION	1
1.0 Background to the Study	1
1.1 Diabetes Mellitus Overview	1
1.2 Statement of the Problem.....	10
1.3 Purpose of the Research.....	13
1.4 Research Objectives.....	13
1.5 Research Questions.....	14
1.6 Significance of the Study.....	14
1.7 Operational Definition	15
1.8 Researcher's Motivation	16
1.9 Summary.....	16
CHAPTER TWO.....	17
LITERATURE REVIEW	17
2.0 Introduction.....	17
2.1 Theoretical Framework.....	18
2.1.1 Illness perception	20
2.1.2 Coping strategies.....	22
2.1.3 Health outcome	24
2.2 Empirical Literature on the Illness perception of people living with Type 2 DM.....	24
2.3 Empirical literature on coping strategies	30
2.4 Self- care management practices among type 2 diabetes patients	34
2.4.1 Lifestyle Modification	35
2.4.2 Strict adherence to treatment/ medication.....	39
2.4.3 Self- Monitoring of Blood Glucose	41
2.4.4 Foot Care	42
2.4.5 Risk-Reduction Behaviours	45
2.5 Factors that influence self-care among type 2 diabetes mellitus patients	47

2.6 Effectiveness of self- care practices among type 2 diabetes patients	48
2.7 Patients' need for education and self-management of DM.....	49
CHAPTER THREE	54
RESEARCH METHODS	54
3.0 Introduction.....	54
3.1. Research Design	54
3.1.1 Research Setting	54
<i>Figure 2. Map of National Diabetes Management and Research Centre – Korle Bu Teaching Hospital, Accra</i>	<i>55</i>
3.1.2. Study Population.....	56
3.2 Sample Size	57
3.3 Sampling Method.....	58
3.4. Research instrument or Data collection tool.....	58
3.5 Instrument Administration Procedure.....	60
3.6 Reliability and Validity.....	61
3.6.2 Pre-testing.....	62
3.7 Data Analysis.....	62
3.7.3 Dissemination of results and publication policy	65
3.8 Ethical Considerations	65
CHAPTER FOUR	67
FINDINGS.....	67
4.1. Socio-demographic characteristics of participants	67
4.2 Medical History and health characteristics of Participants.....	70
4.2 Illness perception of people living with type 2 Diabetes	72
4.3 Coping strategies of participants in managing Type 2 Diabetes Mellitus	75
4.4 Self-care practices among Type 2 Diabetes Mellitus patients	77
4.5 Factors influencing self-care practices among Type 2 Diabetes Mellitus patients.....	78
4.6 Effectiveness of self-care practices.....	85
4.7 Summary of findings	89
CHAPTER FIVE	91
DISCUSSION OF FINDINGS	91
5.0 Introduction.....	91
5.1 Objectives of the study	91
5.2 Major findings of the study.....	92
5.3 Objective 1 discussion of findings.....	94
Illness perception of people living with Type 2 Diabetes Mellitus	94
5.4 Objective 2 discussion of findings.....	97

Coping strategies of participants in managing Type 2 Diabetes Mellitus	97
5.5 Objective 3 discussion of findings	100
Self-care practices among Type 2 Diabetes Mellitus patients	100
5.5 Objective 4 discussion of findings	104
Factors influencing self-care among type 2 diabetes mellitus patients.....	104
5.6 Objective 5 discussion of findings	112
Effectiveness of self-care practices in the management of Type 2 Diabetes Mellitus.....	112
CHAPTER SIX.....	118
SUMMARY, IMPLICATION FOR NURSING, LIMITATION, CONCLUSION	118
AND RECOMMENDATIONS	118
6.0 Introduction.....	118
6.1 Summary	118
6.2 Implications of the study	122
6.3 Limitations of the study	125
6.4 Conclusion	126
REFERENCES	130
APPENDIX A: ETHICAL CLEARANCE.....	149
APPENDIX B: Introductory letter from School of Nursing	159
APPENDIX C: Form from NDMRC-KBTH	160
APPENDIX D: Consent form	161
APPENDIX E: Questionnaire.....	166



LIST OF TABLES

Table 4.1 Socio-demographic Characteristics of Participantss.....	68
Table 4.2 Descriptive statistics of Participants	71
Table 4.3 Complications of Participants	71
Table 4.4 Illness representation and causation of Diabetes Mellitus	74
Table 4.5 Coping strategies of participants in managing Type 2 Diabetes Mellitus	76
Table 4.6 Self-Care Practices among Type 2 Diabetes Mellitus patients	78
Table 4.7 Hierarchical multiple regression for variables that influence self-care practices	83
Table 4.8 Pearson correlation between self-care practices and glycated hemoglobin level	86
Table 4.9 Hierarchical multiple regression of self-care behavior on glycated hemoglobin	88



LIST OF FIGURES

Figure 1 Common Sense Model (CSM) of Self-Regulation of Health and Illness.....	18
Figure 2 Map of National Diabetes Management and Research Centre – Korle Bu Teaching Hospital.....	55



LIST OF ABBREVIATIONS

AADE	-	American Association of Diabetes Educators
ADA	-	American Diabetes Association
AFR	-	African Region
AJOL	-	African Journal online
BMI	-	Body Mass Index
CINAHL	-	Cumulative Index to Nursing & Allied Health Literature
DM	-	Diabetes Mellitus
DSME	-	Diabetes Self- Management Education
DSMT	-	Diabetes Self-Management Training
DSMQ	-	Diabetes Self- Management Questionnaire
EASD	-	European Association for the Study of Diabetes
FPG	-	Fasting Plasma Glucose
HbA1c	-	Glycated or Glycosylated haemoglobin
HIV	-	Human Immune Deficiency Syndrome
IDF	-	International Diabetes Federation
IPQ	-	Illness Perception Questionnaire
IPQ-R	-	Illness Perception Questionnaire Revised
KBTH	-	Korle Bu Teaching Hospital
MODY	-	Maturity onset diabetes of the young
MOH	-	Ministry of Health
NDMRC	-	National Diabetes Management and Research Centre
NHIS	-	National Health Insurance Scheme

NICE	-	National Institute for Health and Clinical Excellence
NIDDK	-	National Institute of Diabetes Digestive and Kidney Diseases
OHA	-	Oral Hypoglycemic Agent
SD	-	Standard Deviation
SDSCA	-	Summary of Diabetes self-Care Activities
SMBG	-	Self- Monitoring of Blood Sugar
WHO	-	World Health Organization



ABSTRACT

Diabetes Mellitus (DM) has become an important area of research over the years, due to the increasing number of people suffering from the disease. In Ghana for instance, the increasing prevalence rate had led to increase in healthcare budget with high economic burden on diabetes patients, families, healthcare system and the nation. There is a great need for self-care management which is relatively cheaper and very important in the treatment of diabetes.

The aim of this research is to examine the role of self-care in the management of type 2 diabetes. Leventhal's Common Sense Model of Self - Regulation of Health and Illness was used as a guiding framework for the study. A cross-sectional hospital based exploratory design was used to conduct this study at The National Diabetes Management and Research Centre (NDMRC) of the Korle Bu Teaching Hospital (KBTH). Survey method was used to collect data from a sample of 400 diabetes patients. Analyses was done using the Statistical Package for Social Sciences (SPSS). Descriptive, correlational statistics and hierarchical multiple regression were the statistical methods used in data analysis. Results from the study showed that total self-care practices was negatively associated with HbA1c. Age, number of years living with DM and total self-care significantly predicted 19.3% of variation in glycated hemoglobin (HbA1c) with total self-care contributing 35.5% to the predictive power. Self-care is effective in controlling glycemic levels (HbA1c) in people with DM. Though participants had high perception on DM and its' management this did not reflect in their self-care practices hence glycemic levels. This study therefore recommends that a balance be drawn between oral health education on DM and monitoring of patients' self-care activities to ensure that patients adhere to self-care practices. In addition, it is recommended that the cost of glucometers be greatly subsidized or factored into NHIS and distributed freely to diabetes patients. A qualitative research is suggested to be done in order to explore the relationship between increased knowledge and practice of self-care among DM patients.

CHAPTER ONE

INTRODUCTION

1.0 Background to the Study

Diabetes Mellitus has become an important area of research over the years. This is primarily due to the already large and increasing number of people suffering from the disease (WHO, 2016). Diabetes Mellitus (DM) is a chronic progressive metabolic disorder characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both (Diabetes, Atlas, 2006, p.17; WHO, 1999). DM is a major cause of illness and death globally, with its impact expected to rise in the years ahead, with population aging and population growth (WHO, 2011; WHO, 2008). Much more needs to be done to ensure that people diagnosed with DM do not suffer the many serious complications of it. For this reason, a research study is designed to examine the role of self-care management in the control of type 2 DM at the Korle Bu Teaching Hospital (KBTH), Accra- Ghana. This research study outlined why self-care management is critical in diabetes care.

1.1 Diabetes Mellitus Overview

There are four general categories of diabetes mellitus: Gestational diabetes, Specific types of diabetes due to other causes, Type 1 diabetes mellitus, and Type 2 diabetes mellitus (American Diabetes Association, 2015). Gestational diabetes refers to high blood glucose levels during pregnancy and this is usually a temporal condition with a long term possibility of type 2 diabetes (National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK] Annual Report, 2016; WHO, 2016). Records in the United States indicate that the probability of women with gestational diabetes to develop type 2 diabetes in the next ten to twenty (10-20) years is 35% to 60% (National Diabetes Fact Sheet, 2011). According to the World Health

Organization's (WHO) criteria: diabetes in pregnancy should be diagnosed if one or more of the following criteria are present: fasting plasma glucose ≥ 7.0 mmol/L (126 mg/ dl), 2-hour plasma glucose ≥ 11.1 mmol/L (200 mg/dl) following a 75g oral glucose load or random plasma glucose ≥ 11.1 mmol/L (200 mg/ dl) in the presence of diabetes symptoms (WHO, 2013, p.4-5).

Another category of DM is the particular or specific types caused by other factors. Examples of these factors are medication- or chemical-induced diabetes (example in the case of: after organ transplant or HIV/AIDS treatment), diseases of the pancreas (like cystic fibrosis) and monogenic diabetes syndromes (such as neonatal diabetes and maturity-onset diabetes of the young [MODY]) (American Diabetes Association, 2015).

Type 1 diabetes (formerly called insulin- dependent, juvenile or childhood- onset diabetes) is an autoimmune condition caused by the body attacking its own pancreas with antibodies and with this DM characterized by deficient insulin production in the body (WHO, 2016). People are born with type 1 DM and they have it all their lives.

Type 2 diabetes is a different type of DM as it is a heterogeneous acquired chronic and therefore long-term and incurable disease. It was formerly called non-insulin- dependent or adult- onset DM. This type of DM happens when the amount of insulin produced is not enough for the body's needs or the body's cells become resilient to it (WHO, 2016). "Type 2 diabetes is characterized by insulin resistance and relative insulin deficiency, either of which may be present at the time that diabetes becomes clinically manifested. The diagnosis of type 2 diabetes usually occurs after the age of 40 years but could occur earlier, especially in populations with high diabetes prevalence (Diabetes Atlas, 2006, p. 17). However, there are increasing reports of children

developing type 2 diabetes (Diabetes Atlas, 2006; “National Diabetes Statistics Report, 2014 - national-diabetes-report-web.pdf,” n.d.). “Type 2 diabetes can linger undetected or asymptomatic or minimally symptomatic for many years, and the diagnosis is often made from associated complications or incidentally from routine laboratory investigations of blood or urine” (International Diabetes Federation, 2006, p.17). It has been established that overweight or obese ($\text{BMI} \geq 25 \text{ kg/m}^2$ or $\geq 23 \text{ kg/m}^2$) adults of all ages who have other risk factors for DM but without any visible symptoms should be screened and tested so that diagnosis of type 2 DM could be made as soon as possible (ADA, 2015).

The occurrence of Type 2 Diabetes Mellitus has been related to factors like lower socioeconomic status, ageing, adjustable factors related to rapid growth of Cities and related changed lifestyle (such as sedentary lifestyle, lack of physical activity, obesity, poor nutrition, high alcohol intake, smoking, physical and emotional hassle), and non-regulating factors such as family history of DM, old age, and ethnicity/race (Bodenheimer, Lorig, Holman, & Grumbach, 2002, “NIDDK Annual Report, 2016. pdf,” n.d.). Incidence of DM in rural areas are increasing more especially where healthcare discrepancies are higher due to lack of access to healthcare facilities, inadequate healthcare providers, higher levels of poverty and cultural practices which may hinder people from seeking or accepting health care (Doherty, Owusu-Dabo, Kantanka, Brawer, & Plumb, 2014). Besides, some people attribute the occurrence of chronic illness like diabetes to spiritual factors (Aikins, Anum, Agyemang, Addo, & Ogedegbe, 2012; Rutebemberwa *et al.*, 2013).

DM in general is characterized by common clinical manifestations of frequent voiding, excessive hunger, excessive thirst, gross weight loss, and slow wound healing. Chronic fatigue and changes in vision are other symptoms. DM affects every system of the body and can cause

complications such as hypoglycemic coma, cardiovascular diseases (heart attack, hypertension), nephropathy (kidney failure), retinopathy (loss of vision) and neuropathy (nerve damage and stroke), and lower limb amputation; all of which lead to chronic illnesses and mortality (WHO, 2016; National Diabetes Statistics Report, 2014; Zucchi et al., 2005, ADA, 2004; Stratton et al., 2000). A report from the National Institute of Diabetes, Digestive and Kidney Diseases stated that 100,000 people are diagnosed with kidney failure each year in the United States. From the report, DM was the most common cause of kidney failure; as it accounts for about 44% of all new cases and about 180,000 of people live with kidney disease resulting from diabetes (“Kidney Disease of Diabetes - kdd_508.pdf,” n.d.). Globally, diabetes inflicts a huge economic burden on the healthcare systems and the wider global economy (WHO, 2016). This problem can be measured directly through medical costs and indirect costs related to loss of productivity, premature mortality, and the negative effect of diabetes on nations’ gross domestic product (GDP) (WHO, 2016).

According to the World Health Organization’s (WHO’s) estimations in 2014, almost 422 million adults worldwide have DM with a prevalence rate of 8.5% among the adult population (WHO, 2016). ‘The total burden of deaths from high blood glucose in 2012 was estimated as 3.7 million with 1.5 million diabetes death and 2.2 million deaths from cardiovascular diseases, chronic kidney disease and tuberculosis’ (WHO, 2016, p.21). The global trend analysis between 1980 and 2014 revealed a substantial rise from 108 million to four times that in the number of diabetes patients. Thus, the prevalence of diabetes has increased substantially, and it is continuing to grow most rapidly in low and middle income countries as well as high income countries (WHO, 2016). From the report,

the largest number of people with DM was estimated by WHO as South East- Asia and the Western Pacific Region. The African region also had an increase from 4 million to 25 million over that time period with a current prevalence of 4% (WHO, 2016, p.25). WHO also projects that non-communicable diseases (NCDs) such as DM, will surpass maternal, perinatal infectious, and nutritional diseases as the leading cause of mortality on the African continent by 2030. In Africa, urban populations are considered to be especially at high risk for diabetes due to the dietetic shift from a minimally-processed, rural nutrition to more ‘Westernized’ foods, as these are quickly gaining popularity in cities (Doherty et al., 2014).

Formally the incidence of DM in the Africa Region (AFR) was rare, but current figures are alarming. The prevalence rate for type 2 DM among the adult group (20–79 years) was 4.9% with the majority of persons with diabetes below 60 years. People aged between 40-59 years were in the highest proportion (43.2%) (Peer, Kengne, Motala & Mbanya, 2014).

Reports from the International Diabetes Federation (IDF) with data from 174 sources (130 countries) indicated that 8.2% of the adults population; aged 20–79 (387 million people) were living with diabetes in 2014 (Guariguata, Whiting, Hambleton, Beagley, Linnenkamp & Shaw, 2014) as compared to 382 million people in 2013 (Forouhi & Wareham, 2014). This figure was projected to rise beyond 592 million in 2035 if nothing is done about the situation (Guariguata et al., 2014). The report also estimated that about 46% of diabetes cases are not yet diagnosed and millions of people are not aware that they are at risk of developing diabetes-related complications (Beagley, Guariguata, Weil, & Motala, 2014). The estimated number of DM cases from low- and middle-income countries was 77% and about 4.9 million diabetes related deaths were recorded worldwide in 2014 (Guariguata et al., 2014; IDF, 2014; da Rocha Fernandes, Ogurtsova, Linnenkamp, Guariguata, Seuring, Zhang, ... Makaroff, 2016).

Diabetologist David Cavan, the International Diabetes Federation (IDF) director of policy and programs, said in a press briefing (*Medscape Medical News*) held during a Congress in 2015 that "The world is facing an unprecedented epidemic of diabetes." According to Dr Cavan, "This increase in type 2 diabetes is associated with modern-day lifestyles, characterized by unhealthy diets, physical inactivity, and increasing obesity. If no action is taken, the IDF estimates that by 2040, there will be 642 million people living with diabetes, an increase of over 50% compared with today's figure." Also, the International Diabetes Federation estimates that in 2015, five million people died from causes related to having diabetes. "That is one death every 6 seconds, and its more than all the deaths from malaria, tuberculosis, and HIV combined," said Dr. Cavan (IDF, 2015). The IDF further approximates that 318 people have impaired glucose tolerance, and about 21 million women developed gestational diabetes (IDF, 2015). China and India were reported to have the maximum number of DM cases thus 110 million and 69 million respectively in 2015. The highest occurrence was found in the Pacific Islands of Tokelu and Nauru where 30% and 24% respectively of all adults are estimated to be living with diabetes (IDF, 2015).

Additionally, the International Diabetes Federation's report showed that Ghana, a low middle- income country, had a raw national prevalence of 3.35% in 2013 and with diabetic-related deaths of 8,529 (IDF, 2013). In 2015, Ghana recorded 266,200 cases of diabetes (IDF, 2015) compared to 39,789 cases in 2005 and 156,076 cases of diabetes in 2010 with prevalence of adult diabetes from 6% to 9% (MOH, 2012 report, pp.13- 14). This shows that the number of diabetes cases has escalated about 6 times over a decade, a large increase in DM in Ghana. Studies indicate that Ghana like most countries in the

Global South is undergoing epidemiological change with increasing incidence of non-communicable diseases such as DM and its related significant burden of disease on the society (Agyei-Mensah and de-Graft Aikins, 2010; Badasu, 2007).

In the management of diabetes, clients require continuous medical (institutional) care with multi-factorial risk- reduction strategies beyond glycemic control (Doherty et al., 2014). Again, the influence of cultural considerations such as duty to family and God's will, the health professional as an outsider, and use of home remedies need to be considered particularly among racial/ethnic minorities (Samuel-Hodge et al., 2000). However, above all, self-care management is essential for the immediate and ongoing health and wellbeing of the person living with DM.

Support and continual self-management sensitization for patients are essential to prevent severe complications and decrease the possibility of long-term complications (Norris, Engelgau, & Narayan, 2001). Persons with diabetes can lead a full life, but keep their diabetes condition under control. In managing DM, a life- long management plan is required and persons living with diabetes have a crucial part to play in this plan (Evans & Pinzur, 2005). Self- care behaviors and behavioral strategies help to promote needed lifestyle changes in clients with DM (Funnell & Anderson, 2004). Self-Care is a personal activity to take care and maintain ones' own self, health and illness and prevention of disease related complications (Orem, 2001a). Diabetes is a lifestyle disease and can effectively be managed with self-care activities like following a diet plan such as avoiding high fatty foods; performing exercises, taking medication (insulin or an oral hypoglycemic agent) when indicated, self- monitoring of blood glucose levels, foot care and seeking proper medical care for diabetes or other health- related problems (Shrivastava, Shrivastava & Ramasamy, 2013; ADA, 2008; Home, Mant, Diaz & Turner, 2008).

Diabetes self-care activities are therefore, behaviors undertaken by individuals living with DM or at risk of diabetes in order to successfully manage the disease on their own (Srivastava *et al.*, 2013; American Association of Diabetes Educators [AADE], 2008). In diabetes self-care, the patient is expected to make changes in his or her personal lifestyle and diet which together with the supportive role of the healthcare provider may boost the confidence level of the patients leading to a successful behavioral change.

Importantly, health education on diabetes care by the healthcare team is very necessary but must also be transferred into action. The primary obligation of the Diabetes Nurse Educator is to ensure that people with diabetes gain the knowledge and skills needed to perform self-care, manage crises, and make lifestyle changes required to successfully manage their condition (Glasgow & Strycker, 2000). Thus the goal of nursing is to enable the patient to become the most knowledgeable and hopefully the most active participant in his or her diabetes care. This imperative emphasizes the need for people with diabetes to manage their diabetes on a day-to-day basis (Clement, 1995).

Walker (1999) stated that reducing the patient's glycated haemoglobin level may be the ultimate goal in the management of DM. However this cannot be the only objective in diabetes care as attention must equally be given to variations in self-care activities for progress toward behavioural change. For instance, checking of one's own glucose levels is the basis for diabetes management that is likely to guarantee patient participation to attain and maintain specific glycaemic levels. Evaluating the overall glucose level and putting in appropriate measures in a timely manner to attain optimum glucose level is the main reason for the monitoring of blood glucose. Personal monitoring of blood glucose indicate present state of glycaemic level, which precedes

assessment of treatment and guides changes in eating habit, performing exercise and medication so as to attain optimum glycaemic control. Regardless of weight loss, regular exercise has been found to have a positive effect on health outcomes among people with diabetes (ADA, 2011; Colberg, Sigal, Fernhall, Regensteiner, Blissmer & Rubin, 2010). In affirmation, a study carried out in Scotland indicated that although the role of the health professional is important for patient's understanding of their blood glucose fluctuations with a suitable self-care action, self-care management activities of the patient herself/himself is key and ought not to be underestimated (Donnan, MacDonald, & Morris, 2002; Shrivastava *et al.*, 2013). Thus the regular follow-up of patients with diabetes with the healthcare provider is of great importance in stopping any long-term complications.

Notwithstanding the above assertion, patients' compliance to these activities have been low. Evidence from India shows low adherence to treatment regimens as a result of poor health literacy and poor attitude among the general public contributes to worsening conditions of diabetic patients (Wilson, 2007). A study from Ghana also showed poor adherence to treatment regimens among patients due to the failure of involving the patients in the decision-making process, patients poor knowledge on health and factors that related to attending physicians and nurses for instance ; communication barriers, prescription of complex drug regimens, , inability to breakdown essential information related to drugs to a level that patients could understand (Bruce, Acheampong, & Kretchy, 2015).

From my observation and experience as a clinical practice nurse for eight (8) years in some Ghanaian hospitals and as a health instructor that visits many health facilities in Ghana for the clinical supervision of students, I have noted that diabetes patients normally report to the hospitals very late in their illness. These patients are either brought in by relatives in an

unconscious state (hypoglycaemic coma or hyperglycaemic coma) or with severe ketosis and Kussmaul respiration. This may be because most of these patients in Ghana associate illnesses like diabetes with guilt or punishment from the gods and so are supernatural (Korsah, 2015). Hence these patients and their relatives tend to seek spiritual help first and manage their condition with prayers from Pastors and herbs from herbalist, fetish priest among others; which means they report to the health facility late and with many complications (deGraft, 2005; Korsah, 2015).

1.2 Statement of the Problem

With the escalating numbers in diabetic cases, there is high economic burden on the national economy, healthcare system, and even on diabetes patients and their families due to the out of pocket health care payment and loss of family income in relation to disability and premature loss of life (MOH Report, August 2012-2016; WHO, 2011).

One of the challenging demands of healthcare providers in Ghana's healthcare institutions today is how to address the needs and incessant demands of patients with chronic illnesses like DM, hypertension, HIV, diabetes and associated heart diseases. The basic requirements for instance for some of these chronic diseases particularly for a person with diabetes is not limited to the control of glycemic levels but also to limit or prevent all complications associated with the condition. Thus strict glycemic control can delay or prevent the development of complications related with DM.

Complications that result from late diagnosis and late presentation, lack of access to essential medication and services, and poor DM management have created a heavy socioeconomic burden for Africa (MOH Report, 2012-2016). Financing health care is

one of the building blocks of health systems but regardless of the above projected estimations, only 1% of global healthcare spending is directed towards diabetes in Africa (Doherty *et al.*, 2014). This is because international funding agencies, research centers and health systems are still principally focused on the region's infectious disease load.

In Ghana; the current National Health Insurance Scheme (NHIS) does not cover all NCDs (M.O.H. Report, August 2012-2016) and in January 2014, there was tax increment from 15.5% to 33% which has affected cost of drugs for the management of diabetes ailment (Daily Guide Africa, July 2014). In response to this increase in tax, Esi Denyoh, President of the Ghana Diabetes Association (representative of the International Diabetes Federation in Ghana), raised some concerns where she appealed to the MOH and the Finance Ministry for special consideration but was directed to petition the Speaker of Parliament to address the problem as the house had the mandate to effect changes which she followed up on but nothing has been done yet (Daily Guide Africa, July 2014).

People with diabetes require continuous medical (institutionalized or health facility based) treatment with multifactorial risk-reduction procedures (self -care activities) beyond glycemic control (Doherty *et al.*, 2014). Self-care management is essential for the immediate and ongoing health and wellbeing of persons living with DM. Individuals with or are at risk of diabetes need to undertake some activities so as to effectively manage or control the disease on their own (Shrivastava *et al.*, 2013; AADE, 2008). In diabetes self-care, it is required of the patient to make many dietary and lifestyle adjustments (example: physical activity, weight loss, cessation of alcohol intake and smoking). Patients' lifestyle adjustments coupled with the supportive role of healthcare personnel help maintain a greater level of self-confidence leading to effective behavioral change.

Health professionals over the world have identified seven crucial self-care management practices: healthy eating, healthy coping skills, being physically active, risk-reduction behaviors, good problem-solving skills, strict adherence to medications, regulation and monitoring of blood sugar in people living with diabetes that envisage good health outcomes. The aforementioned seven management practices were found to correlate positively with good glycemic control, a reduction in complications, and enhancement in quality of life (Shrivastava *et al.*, 2013; ADA, 2009; Odegard & Capoccia, 2007).

Most patients with DM can reduce their chances of developing long-term complications by paying attention to their self-care activities but this is often not achieved due to non-compliance or non-adherence to self-care management practices (Weinger & Beverly, 2010). In a study conducted among persons living with DM in the Tayside region of Scotland that focused on adherence to the prescribed oral drug regimen, only 31% were compliant about sulphonylureas and 34% with metformin, and non-compliance was progressively higher with each increase in the number of tablets to be taken daily (Donnan *et al.*, 2002).

According to the literature; self-report is by far the most practical and cost-effective approach to self-care assessment but it is often viewed as undependable. Yet, it is the best method for engaging people as self-care activities have requirements or adjustments that are tailored towards individual patients and must be changed based on feedback from the patient (AADE, 2008).

Ghana being a middle lower-income country, the lower socioeconomic status of some diabetes patients coupled with high cost of treatment has made patients' patronage

of purchasing diabetes health services and compliance to self-care practices low. But with the escalating number of diabetes cases and pressure on the economy and healthcare budget, diabetes mellitus and the low self-care management of it has thus become a growing public health burden for patients, health care providers, and society (WHO, 2016).

As it has been established that some clients cannot afford continuous medical treatment and the lack of empirical literature on self-care management which is relatively less expensive but has proven to be aid glycemic control, makes this research critical. Most of the reported studies in the subject area are from high income countries hence the need for extensive research in middle-and low- income countries. The outcome or result of this study will contribute to the existing information on self-care Management practices in Type 2 Diabetes.

1.3 Purpose of the Research

The purpose of this study is to examine the role and effectiveness of self-care management among Type 2 diabetes patients at the Korle-Bu Teaching Hospital (KBTH), Accra-Ghana.

1.4 Research Objectives

The Common Sense Model of Health and Illness (Leventhal, 1970) has been used to develop the objectives of the research work. The main objective of this hospital based cross sectional quantitative study is to examine the role of Self-care management practices in attaining optimum glycemic control among type 2 diabetes patients.

Specifically, the study seeks to:

- i. Assess the illness perception or knowledge level of people living with type 2 DM.
- ii. Determine the coping strategies adopted by type 2 diabetes patients in DM management.
- iii. Explore the self-care management practices among type 2 diabetes patients.

- iv. Identify the factors that influence self-care management practices among type 2 DM patients.
- v. Determine the effectiveness of current self-care practices among type 2 diabetes patients.
- vi. Assess patients' needs for education and the types of education required to increase DM self-management and raise self-management effectiveness.

1.5 Research Questions

- i. What is the illness perception of people living with type 2 diabetes?
- ii. What are the coping strategies employed by type 2 DM patients?
- iii. What are the self - care management practices of type 2 diabetes patients?
- iv. What are the factors that influence self-care management practices among type 2 diabetes patients?
- v. How effective is self- care practices in the management of type 2 diabetes mellitus?
- vi. What are the needs for education and types of education required to increase DM self-management and raise self- management effectiveness?

1.6 Significance of the Study

In practice, once this foundation knowledge about DM self-management is gained, the results of this study can be used to improve patient satisfaction, reduce financial cost burden on both patient and the government, and reduce the workload on health care workers especially clinical or practice nurses. This is because the information will guide service delivery where a gap is identified and assist diabetes nurse educators (nurses and midwives) to intensify health education programs for diabetes patients. These health education sessions will include more practical training with emphasis on self- care

skills acquisition which would help patients to participate in their own care, make dramatic influence on the development and progress of their condition and reduce frequent re-hospitalization with diverse complication.

The results of this study would also help stakeholders in the health sector to modify or review the curriculum for trainee nurses and midwives on the management of medical conditions like diabetes. In research, the results will serve as a basis for further studies. Findings of this research would also help to inform policy makers to fully enforce and implement existing policies on non- communicable disease like diabetes and also regulate the production, importation and marketing of certain fizzy foods and beverages in Ghana that may contribute to the overwhelming incidence of diabetes disease as in the case of Mexico and United Kingdom. Finally, the results will give the researcher a better understanding on how to care for diabetes patients.

1.7 Operational Definition

Diabetes Mellitus: This is a chronic progressive metabolic disorder characterized by high blood glucose resulting from defects in insulin secretion, insulin action, or both.

Type 2 DM: It is a condition whereby the amount of insulin produced is not enough for the body's needs or the body's cells become resilient to it.

Self-Care/ Self- Management: It is a personal activity to take care and maintain ones' own self, health and illness and prevent complications.

Self- Care activities: These are behaviours assumed by individuals living with DM or at risk of diabetes in order to effectively manage their own condition.

Glycated or Glycosylated Haemoglobin (HbA1c): This is a form of hemoglobin (a blood pigment that carries oxygen) that is bound to glucose. HbA1c test is routinely performed in

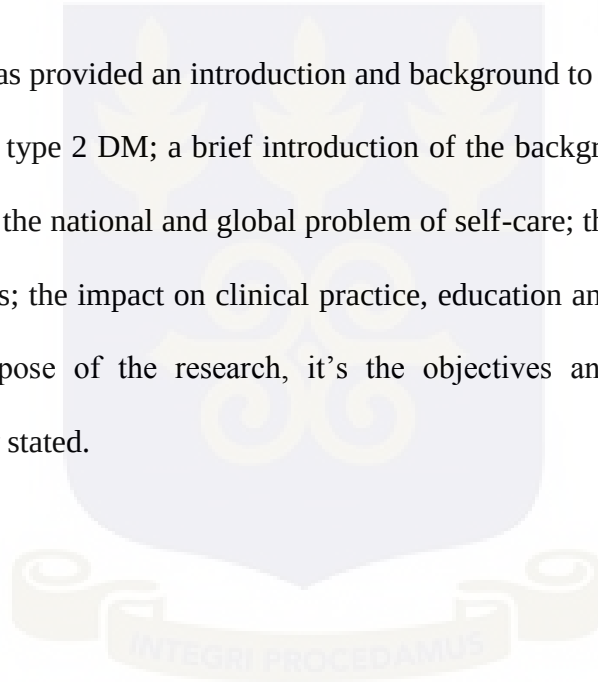
people with diabetes and the levels are reflective of how well diabetes is controlled. The values reflects blood glucose levels over the past 6- 8 weeks and not daily up and downs of blood sugar.

1.8 Researcher's Motivation

This research is carried out because the researcher is a trained Diabetes Nurse Educator and would like to gain an in-depth knowledge in this chosen area of interest in order to make an original contribution to the frontier of knowledge.

1.9 Summary

This chapter has provided an introduction and background to the study; the role of self-care in managing type 2 DM; a brief introduction of the background to the research problem in relation to the national and global problem of self-care; the significance of the study to policy makers; the impact on clinical practice, education and research were also highlighted. The purpose of the research, it's the objectives and definition of key concepts were equally stated.



CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

A literature review provides a background of current knowledge on a topic and highlights the necessity for new studies (Polit & Beck 2010). The aim of this chapter is to identify and examine research previously undertaken surrounding self-care in the management of type 2 DM. The chapter is organized within four sections. The first section is the theoretical basis of the study, followed by a comprehensive review of literature concerned with the illness perception or illness beliefs of people living with type 2 Diabetes Mellitus as the second. The third section considers coping strategies of participants in managing Type 2 DM, while the fourth section is about the self-care practices among Type 2 diabetes patients and the effect of these practices on participants' glycemic levels. This fourth section is also being organised under the following headlines: (a) Lifestyle modification under which diet and exercise are discussed, (b) Strict adherence to medication, (c) Self-Monitoring of Blood Glucose (SMBG), (d) Foot care and (e) risk reduction behaviours.

The search items used in this review were journal articles, papers (Newspapers and thesis), reports and books. The Databases such as African Journals Online (AJOL), BioMed Central, Ebsco Host- Cumulative Index to Nursing & Allied Health Literature (CINAHL), Medline (Pubmed), JSTOR, Science Direct, SAGE, Wiley and "Google Scholar" were the search engines employed. The criteria for the search was abstracts, PDF full text articles, current updates, both quantitative and qualitative research articles, and articles written in English language.

The researcher combined several key words in search of literature for this review. Examples of such include “Knowledge”; “self- care” or “self- management” or “self – treatment”; “Glycemic control”; “Type 2 diabetes mellitus”; “Common Sense Model” and “Type 2 diabetes”; “Illness perception” and “Type 2 diabetes”; “Coping” and “Diabetes Mellitus”; “Coping” and “Physical Health Conditions”; “Social support” and “Self-management”, among others. Most often, an advance search was conducted with the use of CINAHL MEDLINE and Science Direct databases.

2.1 Theoretical Framework

The Common Sense Model (CSM) (Leventhal, 1970; Leventhal, Meyer & Nerenz, 1980; Leventhal, Nerenz & Steele, 1984) is the theoretical framework guiding this study. Hence the literature search and the objectives of the study were carried out within the context of Leventhal’s Common Sense Model of Self-Regulation (CSM) of health and illness, as presented in Figure 1.

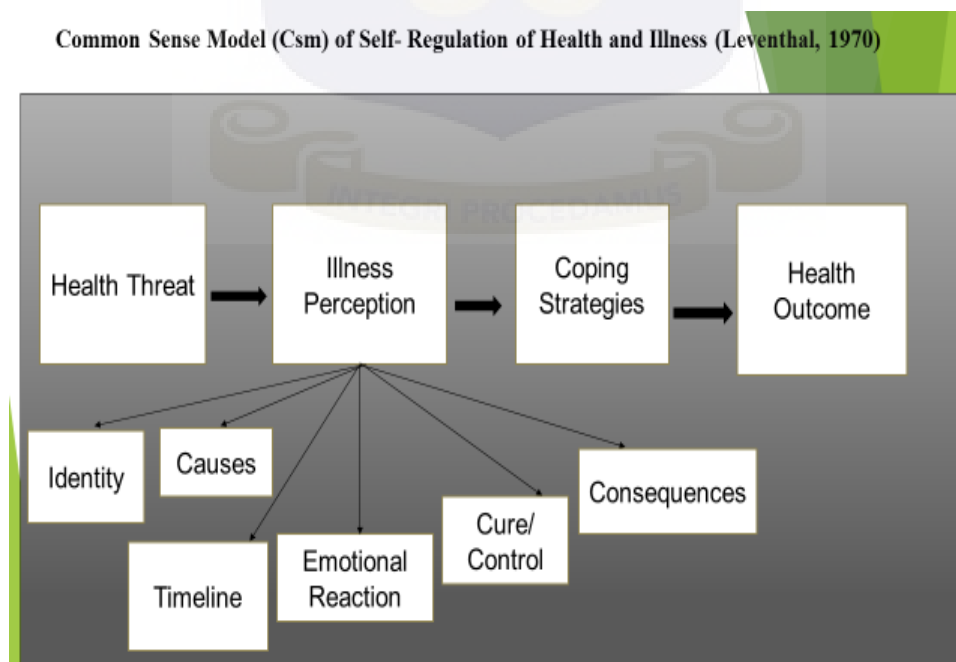


Figure 1. Common Sense Model (CSM) of Self-Regulation of Health and Illness

The CSM is very attractive to health because it theorizes people as problem solvers who take an active role in the management of their own health. This implies that patients with acute and chronic illness can be assisted to attain healthier outcomes when they have a more adaptive knowledge and awareness on their condition and are able to evaluate the effects of acting on this knowledge. (Wearden & Peters, 2008).

Leventhal and his colleagues started their research in the late 1960s and early 1970s. They observed the effect of fear messages on peoples' health-promotion actions: for example, giving up on smoking in practically critical situations (Leventhal, Brissette & Leventhal, 2003). It was found that for actions and attitudes to be perceived as a health threat, diverse types of information which only lasted for short periods of time come into play.

Again, to understand the adaptations and coping efforts that are to be made and maintained in people experiencing chronic illness, Leventhal *et al.* (2003) further proposed the model of adaptive system which is currently called the Common Sense Model of Self-regulation of Health and illness. This model has four constructs namely; (1) 'Representation' of the illness experience or illness perception, (2) Action planning or 'coping' responses and performance and (3) 'Appraisal' or monitoring of the success or failure of coping efforts and health outcomes (Nerenz & Leventhal, 1983). The 3 phases in the common sense model is cyclical and will continue to exist until the health threat has been successfully controlled or eliminated. This implies that; if the implemented procedures or coping strategies are effective in dealing with the health threat, the cycle stops but if futile, the individual client will have to re-examine the illness representation and form a new one then make a new choice and execute appropriate corrective actions. (Cameron & Leventhal, 2003).

2.1.1 Illness perception

The first construct is Illness representation stage (also called the cognitive or perceptual stage). An Illness representation can be described as a schema about the individual's experience of an illness or health threat. Other terms used for this construct in the literature include mental model, illness narrative, illness perception, illness beliefs or the explanatory model. Here, there exist a disagreement between the individual and the health threat. The individual develops beliefs or mental representation about the illness or potential health threat. These mental illustrations combine with the prevailing normative guiding principles that people hold, to support them to make sense of the symptoms of their condition. Illness perceptions reflects client's knowledge on disease condition and this include: identity, cause , timeline, cure and treatment control and consequences (Huston & Houk, 2011; Brownlee, Leventhal & Leventhal, 2000; Lau, Bernard & Hartman, 1989).

The cognitive system operates in parallel and interacts with the individual's emotional system and produce emotional experiences like fear that guide the use of activities for managing them (Cameron, Durazo & Rus, 2017). Thus, presence of a health threat may trigger emotional response such as distress (fear, anger, anxiety or worry) because of the individual's assessment of the high risk for harm and the essential resources needed to meet the challenging demands posed by the health threat (Cameron *et al.*, 2017).

Identity may be present in abstract form, for instance, the label applied to the health threat (such as diagnosis or name of the condition like diabetes mellitus) and/or concrete form, thus how the threat is experienced (such as symptoms and/or changes in

function). Causes denote the likely factors or measures that trigger the health threat. The causes of a threat can be grouped into external agents (such as stress), internal susceptibilities (such as age, autoimmunity), and behaviours (such as inadequate exercise, high intake of sugary, fizzy and fatty foods, alcohol and smoking). Timeline refers to individual's view of the likely duration of their health problems and these have been classified into three namely; acute or short-lasting, chronic and cyclical. Client's beliefs about how long the condition might last is re-examined as time progresses, as it has been suggested by Brown that 'Inside every chronic patient is an acute patient wondering what happened' (Brown, 2002).

Controllability or cure component refers to the extent of belief of the client as to whether; the health problem can be managed by one self and or experts (such as health professionals). For instance, focusing on dietary content and strict physical activity is a way that diabetes patients attempt to control their symptoms (Hale, Treharne, Macey & Kitas, 2006). Consequences are the individual's beliefs about the severity of the illness and the potential effects produced by the health threats on psychological, physical, social and economic functions and this could be anticipated (abstract), perceived or experienced.

The authors of revised illness perception questionnaire (IPQ-R) added items to measure illness coherence (people's view on how they understand the illness) and emotional representations (people's view on how illness affect them emotionally) (Moss-Morris, Weinman, Petrie, Horne, Cameron & Buick, 2002). Again, timeline and cure/control were divided into two dimensions each hence there is timeline cyclical and timeline acute/chronic, personal control and treatment control (Moss-Morris *et al.*, 2002). Timeline cyclical refers to the perception of the cyclical nature of the illness across time (Dempster, Howell & McCorry, 2015) about the illness passing quickly or not. Individual's perception on the impact of the disease condition may

develop into more realistic beliefs over time. Although the components of illness perceptions are distinctive, they can have specific effects on coping and outcomes hence they are not necessarily independent (Leventhal *et al.*, 1984). Representations on the impact of the disease condition may develop into more realistic beliefs over time. Although the components of illness representations are distinctive, they can have specific effects on coping and outcomes: hence, they are not necessarily independent (Leventhal *et al.*, 1984).

2.1.2 Coping strategies

The second phase of the Common Sense model is the response stage where the individual chooses and implements actions (coping procedures) so as to reduce the disagreement e.g. DM. That is the selected coping strategies used by clients will help to decrease or avoid the negative characteristics of diabetes mellitus. The client's illness beliefs developed during the perceptual phase will aid the individual client in selecting the types of coping procedures to be used during the response phase.

Definitions of coping are many. But for the purpose of this study Coping strategy is defined as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of a person” (Lazarus & Folkman, 1984, p.141). Folkman and Moskowitz (2000) outlined two categories of coping strategies, namely: problem focused and emotion focused coping strategies. The problem focused type of coping may be put in place when the individual notices that the health threat or the stressor is subject to change (Folkman & Moskowitz, 2004). Dimensions of problem focused type of coping includes planning, suppression of competing activities, seeking of instrumental social support and restraint

coping (Carver, Scheier & Weintraub, 1989). With reference to diabetes management, problem focused coping may be much applicable to lifestyle modification in-terms of diet planning. Emotion focused coping strategies are activities meant to manage emotions and emotional effect of experience, example; feelings of sadness, fear and anger. That is emotion focused coping basically is to control emotional distress. It is normally employed when the individual views the situation as one in which nothing could be done to reverse it. Dimensions of emotion focused coping strategy includes individual's seeking of emotional support, positive thinking, acceptance of responsibility, denial of suffering from the condition and turning to religion (Carver *et al.*, 1989). Carver and colleagues also added Venting of emotions (expression of negative feelings), behaviour disengagement (individual's attempt to give up on activities) and mental disengagement as a third part to the categorization which they themselves considered questionably less useful (Carver *et al.*, 1989).

From the literature apart from the above categories, there are several other groupings of coping strategies, some researchers group the various dimensions into Active and Passive coping strategies (Gerin, 2011), Positive and Negative coping strategies (Chylova & Natovova, 2012; De Ridder, Depla, Severens, & Malsch, 1997), Effective and Ineffective coping strategies (Shayeghian, Aguilar-Vafaie, Besharat, Amiri, Parvin, Gillani & Hassanabadi, 2015). Some other researchers reported neutral coping methods like ignoring a stressor (Yanos, West & Smith, 2010) and Cognitive versus Behaviour, Physical versus Affective, Social versus nonsocial, Problem focused versus Emotion focused and Avoidant versus Non avoidant coping methods (Rollins, Bond, Lysaker, McGrew, & Salyers, 2010). Aldwin and Yancura (2011) also stated 5 categories: Problem focused, Emotion focused like avoidance, social support, cognitive reframing and religious coping strategies. One study by Korsah (2015) in Ghana also grouped

coping strategies into cognitive coping strategies, emotional coping strategies, seeking social support and the use of spirituality as coping. However; some researchers still maintained the various dimensions as individual items.

2.1.3 Health outcome

The last construct is the appraisal phase and here, action(s) intended to decrease or remove the disagreement are assessed and judgement is made. With this study the outcome measures would be self-care management practices and glycemic levels of patients.

Glycated haemoglobin (HbA1c) is a measure of average blood glucose level for the past two to three months. The values of HbA1c are expressed in percentages. Good glycemic control is defined as "a pre-prandial (fasting or before eating) blood glucose level between 80 and 130 mg/dL (4.4-7.2 mmol/L), a 1- to 2-hr postprandial blood glucose level < 180 mg/dL (<10.0 mmol/L), and HbA1c level < 7.0%" (ADA, 2015).

Usually, patients with HbA1c values less than 7% (<7 %) are assumed to have good glycaemic control, then those with values greater than 7 % (>7 %) have poor glycaemic control as stipulated in some health clinical guidelines on diabetes care (NICE 2008).

2.2 Empirical Literature on the Illness perception of people living with Type 2 DM

People with chronic illness example diabetes mellitus obtain new information about their condition and evaluate their attempts to regulate, cure or cope with its effects, new pictures are formed and developed based upon these experiences. Though the terms: 'illness perceptions', 'illness cognitions', 'illness representations', and 'illness beliefs' are

often used interchangeably by researchers, however the terms illness perception and illness beliefs is being used within the context of this study.

Illness perception normally amass, as new information is embraced, rejected or modified as required. These perceptual representations are, therefore, expected to be linked to the selection of coping procedures, action plans and outcomes. Mental representations and responses to illness example in the case of diabetes mellitus; are based on various sources of information from the medical community (attending medical officers, nurses, nutritionist/ dieticians, opticians, dentists, laboratory technicians or bio-medical scientists among others and posters/bills posted in and around the clinical area, environment (family and significant others), media, peers and personal experience but most often these may not always be adequate representation of factors that influence glucose control (McAndrew, Horowitz, Lancaster & Leventhal, 2010).

From the explanation above, integration of information from the various sources on illness development provide a framework for responding to health threats like diabetes mellitus. For instance, some illness perception of DM include the belief that symptoms like extreme hunger, dizziness, headache, excessive thirst, fatigue, among others can be used to measure blood glucose levels (Breland, McAndrew, Burns, Leventhal, & Leventhal, 2013).

It is important for clinicians to appreciate the multiple levels at which mental representations operate and how they guide patients' preferences for treatment and the behaviours in which they engage in over- time hence the need for patient education and support which are essential in avoiding acute complications and reducing the risk of long-term complications (Norris, Engelgau & Narayan, 2001).

Some researchers have shown that; peoples' perception about diabetes treatment really have effect on their compliance to treatment. Example it was found that clients who thought,

they were at the lowest risk of cardiovascular disease (diabetes complication) from the beginning did not adhere to their medication regimen (Statin) in a study on Long-term compliance to statin treatment in DM (Donnelly, Doney, Morris, Palmer & Donnan, 2008). An exploratory study on 121 type 2 DM patients reported that 32.8% had the perception of medication causing adverse effects whilst 13.9% perceived it would have effect on their weight hence poor medication adherence (Farmer, Kinmonth & Sutton, 2006).

A systematic review of 1454 articles between 1990 and 2009 by some researchers (Nam, Chesla, Stotts, Kroon & Janson, 2011) revealed that; people's health beliefs, knowledge, adherence, and attitude towards their disease condition affect self-management. The review stated that; patients who adhered to self-care regimen which is one important characteristics to self-management has the probability to reduce mortality and disability, improve quality of patient life and reduce health care cost. Also patients' attitude and beliefs about diabetes and its' treatment significantly affects their perception about the need for and the importance of self-management. For instance the study of Anderson *et al.* (1990) confirmed that there is a strong association between positive attitudes and adherence outcomes. Other finding also suggest that, individual with positive attitudes toward management of their diabetes are more to change their self-care behaviors in order to control their blood glucose levels than those patients with negative attitudes.

Furthermore, from Nam and colleagues (2011) systematic review, the researchers found that; common misconceptions about various diabetic treatment regimens also affect patients' ability and the degree to participate in self-management. For instance, a survey

among type 2 diabetes patients revealed that the patients were not willing to receive insulin if it were prescribed to them because they perceived that as punishment for failing to manage their disease condition, evidence of failure, fear of daily insulin injections, and the ability of insulin to produce no positive effects but rather worsen their condition and further produce complications. Finally, the review asserted that, knowledge is a necessary but not a sufficient condition for positive health outcomes implying patients' knowledge about diabetes does not necessarily lead to risk-reducing behavior as people may have adequate knowledge on the disease but engage in unhealthy lifestyles.

Similarly, results of Hart and Grindel's study on 'Illness representations, emotional distress, coping strategies, and coping efficacy as predictors of patient outcomes in type 2 diabetes' research indicated that; participants under study envisaged their diabetes condition as being chronic, moderately cyclical with adverse consequences and moderate amounts of symptoms that largely affects their emotional status. The analyses showed that illness representations especially timeline-cyclical was responsible for 12% total variation in glycated hemoglobin levels. Researchers concluded that, the study confirmed that illness representations, emotional distress, coping strategies, and coping efficacy affects self-care behavior and health outcomes. However, emphasis was made that psychosocial factors regulate lifestyle behavioral changes and disease outcomes among individuals with diabetes mellitus. This suggests a great need for nurses to include capacity building in coping skills and cognitive behaviour therapy in their daily routines during health assessment and diabetes management so that diabetes patients will identify useful and meaningful coping strategies, effective coping efficacy, and change their misconceptions about diabetes mellitus so as to improve self-care behavior and health outcomes (Hart & Grindel, 2010).

Reports from a study that engaged 359 participants in examining the effects and relationships between perceptions, self-management and metabolic control outcomes among type 2 diabetes patients of European and African origin in London revealed that; diabetes clients from both African and European origin perceived diabetes with dire consequences to be closely related to poor self-management. From the study; the relationship between beliefs on personal control and self-management was however stronger among participants of African origin. The researchers indicated that illness perceptions was responsible for significant changes in self-management behaviors of participants of both origins with personal control been the main factor that influenced the variations in self-management, however, the variations in self-management among African-origin patients were also attributed to other constructs of illness perception like consequences and emotional representation (Abubakari, Jones, Lauder, Kirk, Anderson & Devendra, 2011).

Similarly, an observational study on insulin treated veterans with type 2 diabetes revealed that, higher knowledge score of patients was related to perceived fewer barriers to blood glucose monitoring however, their performance on the diabetes knowledge test was found to have no relation to perceived adherence to self-care, diet, exercise or medication.

Another study involving 49 type 1 and 108 type 2 diabetic patients investigated the illness perception of diabetes patients in 2011. The study actually extended a preceding research by exploring diabetes patients' beliefs on specified medications like insulin, cholesterol drugs, blood pressure and the association between these medicines, adherence and blood sugar level (Broadbent, Donkin & Stroph, 2011).

Report on Broadbent *et al.*'s (2011) study revealed an increased knowledge on medication. Thus, clients (86%) ranked medication as the most significant followed by diet (22%) and exercise (17%) in the treatment of the disease. Patients on insulin were of the view that, insulin was more beneficial for DM patients than exercise and diet. People had lower perception on the consequences of diabetes and related adherence medication to greater personal control, fewer symptoms and lesser distress (Broadbent *et al.*, 2011). This was in line with previous studies that adherence to physical activity and dietary regimen were related to people's beliefs about the benefits these activities (Glasgow, Hampson, Strycker & Ruggiero, 1997). There was no evidence that specific medication beliefs were linked to adherence to specific medications. However, only a portion of the sample was prescribed for each medication, so the power to detect variations in perceptions between adherent and non-adherent patients was reduced therefore the need for future researchers to use a larger sample size to further examine the relationship between compliance and specific medication beliefs. Some researchers also stated that; intervention trial to investigate the effects of changing illness perceptions in poorly controlled diabetes patients is underway (Keogh, White, Smith, McGilloway, O' Dowd, Gibney, 2007).

Non- compliance to treatment and lifestyle changes in diabetes is connected to frequent hospital admission and deaths (Ho, Rumsfeld, Masoudi, *et al.*, 2006), however many patients fail to abide by treatment recommendations (Cramer, 2004). Currently, illness perceptions is related to adherence to strict eating habit and exercise recommendations, blood glucose monitoring, follow-up to the health facility and blood glucose levels (HbA1c) (Harvey & Lawson, 2009). It was noted that specific treatment perceptions for instance; the success of physical activity and

dietary regimen predicts compliance to definite behaviors than combined treatment perception scales (Glasgow *et al.*, 1997).

From the literature, it has been noted that many studies reported positive changes. That is; there was evidence that; education and knowledge or illness beliefs support self-care management and glycemic control. Some studies also revealed mixed results (Albano, Crozet & d'Ivernois, 2008) and other negative results with unchanged or high HbA1c levels after health education, no effects on patients knowledge and no change in patients undesirable health beliefs (Albano *et al.*, 2008; Davis, Heller, Skinner, Campbell, Carey, Cradock & Khunti, 2008).

2.3 Empirical literature on coping strategies

Several research studies in which various dimensions of coping strategies were used by patients including people with diabetes mellitus were also reviewed. For instance; a meta-analysis of 31 articles that examined illness perceptions and managing physical health conditions revealed that illness representation on consequence and emotional representation had a very strong relationship with disease outcome. However, dimensions of Coping were found to be more predictive of outcomes than the dimensions of illness representations. Coping strategies like denial, behaviour disengagement and venting of one's emotion was observed to have the strongest relationship with outcome (Dempster *et al.*, 2015).

Social support defined as “an exchange of resources between (at least) two persons, aimed at increasing the well-being of the receiver” (Shumaker & Brownell, 1984). Social support may be in the form like care from family members, friends,

neighbors, colleagues, fellow diabetes patients, pen friends and social networking on the Internet example from WhatsApp, Facebook, and Google among others (Kadirvelu, Sadasivan, & Ng Shu, 2012).

Mary Gallant (2003) found that there was a positive relationship between social support and chronic illness self-management particularly DM during a literature review of 29 articles. However, most of the studies the researcher examined were not theory based so the mechanism by which the relationship occurs and the most influential dimension of support on self-management could not be stated. Findings indicated that dietary behaviour was more susceptible to social influence and members of the social network may possibly have negative influence on self-management.

Similarly, a review carried out by Kadirvelu, Sadasivan and Ng Shu (2012), in which the various components that affect self-care in persons with type 2 DM was examined. The researchers delved into the role that social support play, the importance of care from family, friends, peers and health care providers, the effect of sex and cultural factors on self-care behavior and the role that literacy play in diabetes self-care. The researchers found that; Family and friends assist clients in self-management activities like checking of blood glucose, giving of insulin injection, planning and preparing of diabetes meal, foot care, and supervision of exercise (Kadirvelu *et al.*, 2012). This was because, behavioral adjustments may be difficult when enforced by the individual patient. That is, practical and emotional support from family and friends may have a positive effect on the overall measure of DM self-management behavior. Example; the study of Chlebowy, Hood and LaJoie (2010) found a positive association between family and friend support and eating healthy diet, exercise, compliance with medication, testing for sugar and foot care. Clark, Becker, Janz, Lorig, Rakowski and Anderson (1991) were of the

view that self-care in DM management included important specific activities as compared to other chronic illness. These activities ranged from checking of blood glucose, taking appropriate diet, engaging in regular exercises, taking of medication, avoidance of alcohol, putting an end to smoking, being aware of and responding to symptoms, managing acute episodes like hypoglycemia, psychological response management and managing relations with significant others.

Again, results from the systematic review of Nam *et al.* (2011) indicated that, authors like Gleeson-Kreig (2008), Rosland, Kieffer, Israel, *et al.* (2008) and Tang, Brown, Funnell & Anderson (2008) also found that there was the need for healthcare experts to support patient as they learn to manage their disease condition. For instance, Tang *et al.* (2008) found in a survey that more than 40% of the people with diabetes acknowledged that their physician gave them the greatest social support in the management of their condition.

Another study found that, family and social support was an important facilitator to diabetes management among rural African American adults. In this study, family and friends among others helped participants to make healthy food choices and decisions regarding diabetes management and patients were comfortable in sharing information concerning health with peers than health providers (Byers, Garth, Manley & Chlebowy, 2016).

Several studies have reported that some people with chronic disease example diabetes adopts religious coping in the management of their disease states. Example; A qualitative study to identify Influences on day-to-day self-management of type 2 diabetes Among African-American women by Samuel-Hodge and colleagues (2000) revealed

that; spirituality was an important factor in general health, disease adjustment, and coping. They found the meddling of daily disease management by life stressors, multi-caregiving tasks and the severity of diabetes which is expressed in feelings of dietary deprivation, physical and emotional “fatigue,” “fear,” and apprehension of diabetes complications were the most consistent themes that emerged from 70 participants under 10 focus groupings. Hence they advocated that family-centered and church-based approaches should be integrated in DM management. In a related study by Patel, Shah, Peterson and Kimmel (2002); the researchers also found that religious beliefs were related to perception of depression, illness effects, social support, and independently of medical aspects of illness in patients with End Stage Renal Disease.

Namageyo-Funa, Muilenburg and Wilson (2015) also explored the role of religion and spirituality in coping with type 2 diabetes among black men qualitatively. The researchers found that religion and spirituality were influential to coping with health. They indicated the various dimensions of religious coping as used by the participants. Nine out of the twelve (9 out of 12) participants described how their beliefs in prayer and in God has worked for them, Six (6) participants believed that God has kept them alive, Six participants said they have turned things over to God to handle for them the things they could not handle, 5 participants believed God has helped them changed their unhealthy behaviors like drinking and smoking, 4 participants narrated how God supplies their needs, 4 participants spoke on how reading the Bible helps them, and 2 participants reported how religious or spiritual individuals has helped me. Lundberg and Thrakul (2013) also found that Buddhist and Muslim women had abilities for self-management often related to their religions. But, many of them had poor control of their blood sugar levels and needed assistance.

Humor was also seen as a way of coping. Vaillant (1977) defined humor as “the ability to express one’s thought and feelings without discomfort to oneself or others. Laughing as an aspect of humor has been proven to have a positive influence on the body and health (Robinson 1991). A study revealed that there was a relationship between health status and humor coping, health status and life satisfaction and indicated that humor as a coping strategy seems to be present in older adults with better health (Celso, Ebener, & Burkhead, 2003). Some researchers also investigated into the degree to which humor and negative affect predict different components of physical health. These researchers indicated that adaptive self-enhancing humor influenced facilitative coping strategies such as planning, changing of perception and the active use of humor. However maladaptive aggressive humor was associated with dysfunctional coping pattern which such as greater denial and a reduced ability for the individual to change one’s belief (Kuiper & Harris, 2009).

Additionally, a longitudinal study by Merz, Malcarne, Hansdottir, Furst, Clements and Weisman (2009) examined the relationship between humor and physical/mental health variables among patients with systemic sclerosis and rheumatic disease. The study revealed a negative relationship with severity of disease, disability pain, and distress but after controlling for covariates humor coping did not significantly explain any change of the disease-related outcomes either cross-sectional or longitudinally. The researchers concluded that humor coping may not be directly useful in quality of life.

2.4 Self- care management practices among type 2 diabetes patients

People with diabetes can lead a full life, while keeping their diabetes under control. This illness requires a life- long management plan and persons with diabetes

have a vital part to play in this plan. Self-care activities and behavioral strategies help to promote lifestyle changes in clients' with diabetes mellitus (Funnell & Anderson, 2004). Diabetes Self-Care activities are therefore behaviors or coping procedures undertaken by individuals with or are at risk of diabetes in order to successfully manage or control the disease on their own (Shrivastava *et al.*, 2013; AADE, 2008).

In diabetes self-care; the patient is required to make many change with regards to diet and lifestyle (example: physical activity, weight loss, cessation of alcohol intake and smoking). Patients' lifestyle modifications coupled with the supportive role of healthcare providers help maintain a higher level of self-confidence leading to effective behaviour change. Self-Care behaviours in the management of diabetes include; following a diet plan, engaging in regular exercises, strict adherence to treatment regimen (insulin administration or intake of oral hypoglycemic agent), self-regulation and monitoring of blood glucose levels, foot care, risk-reduction behaviors (avoidance of alcohol, high fatty and fizzy foods, smoking), good problem-solving skills (recognizing and response to symptoms, managing of acute episodes like hypoglycemia) and seeking proper medical care for diabetes or other health-related problems (Shrivastava *et al.*, 2013; ADA, 2008; National Institute for Health and Clinical Excellence [NICE] 2008).

2.4.1 Lifestyle Modification

Diabetes Mellitus is a long-lasting disease that usually necessitates modification of the individual's lifestyle, more specifically in the areas of diet and physical activity (Franz, 2003). The Guidelines from the American Diabetes Association and the European Association for the Study of Diabetes (EASD) emphasize the usefulness of diet and exercise in the treatment of all stages of type 2 diabetes (Inzucchi, Bergenstal, Buse, *et al.*, 2012).

2.4.1.1 Diet

The required diet for people with diabetes is the standard or normal diet that the whole populace should be taking in (Canada's Food Guide, 2007). This entails taking in various food like fruits and vegetables, grain products, milk, and meat and their alternatives. Here attention is paid to foods that are low in energy so as to help the individual reach and maintain healthy body weight.

It is advised that diabetic clients must avoid refined sugars example granulated sugar, beverages like milo and richoco and the fizzy drinks like coca cola, fanta, sprite, malt except in cases of hypoglycemia where immediate action of boosting up the glucose level is required. Also people with diabetes can take in complex or unrefined sugars (rice, yam, plantain, cassava, cocoyam, potato, maize etc.) in moderation. Fruits (water melon, apple, grape fruits, banana, berries e.t.c) and vegetables (okra, garden eggs, green pepper, cucumber, carrot, onion, tomatoes, lettuce, “kontomire”) can be taken liberally.

Reports show that dietary fibre example garden eggs (egg- plant), okro (okra), beans, oat and barley among others slow glucose absorption thereby increase glycemic control and decrease the individual's chances of developing cardiovascular diseases (Jacobs, Meyer & Kushi (1998). Based on this findings, it is advised that people with diabetes above the age of fifty (50) years take in thirty eight grams (38g) and twenty-five grams (25g) of fibre as compared to thirty (30) grams and twenty- One (21) grams of fibre for males and females without diabetes respectively with reference to the normal adult range of twenty five to fifty grams (25- 50g) per day (Anderson, Randles & Kendall, 2004; Chandalia, Garg & Lutjohann, 2000).

Some researchers have recommended that older clients above age fifty (50) should consume 10ug (400 I.U) of vitamins D (Health Canada Eating Well with Canada's

Food Guide, 2007) daily and women within the reproductive age that desires to get pregnant must take Folic acid supplements (0.4- 1.0 mg). Aside the vitamins listed for the above vulnerable group of people, the need for other vitamins must be assessed solely on individual bases.

2.4.1.2 Exercise

Physical activity or exercise for instance: jogging, bicycling, brisk walking, dancing, continuous swimming and raking leaves among others involves continuous , rhythmic movements of large muscles and last for a minimum of 10 minutes (“CDA Clinical Practice Guidelines - Chapter 10: Physical Activity and Diabetes,” n.d.).

Researchers have found that physical activities aid diabetic clients to attain various targets like optimal glycemic control and lipid profile, improved cardiac and respiratory fitness, vitality, reduced insulin resistance, blood pressure and development of peripheral neuropathy and maintenance of individual weights (Chudyk & Petrella, 2011; Colberg, Sigal & Fernhall, 2010; Snowling & Hopkins, 2006; Balducci, Iacobellis & Parisi , 2006; Nielsen, Hafdahl & Conn, 2006; Wing, Goldstein & Acton, 2001).

Similarly, some cohort studies have indicated that; exercises (Hu, Jousilahti & Barengo, 2005; Gregg, Gerzoff & Caspersen, 2003; Hu, Stampfer & Solomon, 2001) and cardiorespiratory fitness (Church, LaMonte, Barlow & Blair, 2005) in type 2 diabetic clients have helped to decrease the incidence rate of developing complications like cardiovascular diseases and death by thirty- one percent (31%).

Though, physical activities have numerous benefits as outlined above, some factors like lack of motivation (Praet *et al.*, 2008), inadequate activity monitoring (Dunstan *et al.*, 2006) and

injuries to mention but a few have effect on adherence to exercise programs and this could range from 10% to 80%, particularly in the long term (Praet & van Loon, 2009). Hence, findings of some studies suggest that; compliance by people with diabetes to these activities is much enforced when clients keep a diary on or records of their activities daily. This enhance their confidence level to carry out the exercises as that give evidence of indirect supervision (Gleeson-Kreig, 2006). Other studies have shown that structured exercise by licenced and competent healthcare personnel improves physical activity levels and in-turn control glycemic level (Kirk, Mutrie, MacIntyre & Fisher, 2004; Wolf, Conaway & Crowther, 2004). Therefore, the need for medications like insulin also goes down.

A systematic review and meta-analysis also revealed that; exercises must be supervised in order to yield positive glycemic control without interventions of dietary regimen (Umpierre, Ribeiro & Kramer, 2011; Balducci, Zanuso & Nicolucci, 2010). Some researchers also stated that exercising with partners, friends or family members promote regular physical activity in females (Van Dam, Van der Horst & Knoop, 2005).

The risk of hypoglycemia in type 2 diabetes patients on insulin and sulfonylureas (example: Glibenclamide, Tolbutamide, Glicazide) is of minimal concern as compared to people with type 1 diabetes who are supposed to take 15- 30 g of carbohydrate if they record a glucose level less than 5.5 mmol/L before exercise. Thus, clients that manage their condition on oral hypoglycemic agents and lifestyle has low risk of developing hypoglycemia during exercise hence do not necessarily need to check their blood sugar levels nor supplement with carbohydrate in any physical activity that would last less than

an hour. (“CDA Clinical Practice Guidelines - Chapter 10: Physical Activity and Diabetes,” n.d.).

2.4.2 Strict adherence to treatment/ medication

Adherence to treatment is the degree to which a person’s conduct example; taking medication corresponds with agreed upon recommendations from a health-care provider (WHO, 2003). Or can be defined as the “patient’s conformance with the provider’s recommendation with respect to timing, dosage, and frequency of medication-taking during the prescribed length of time”. Factors causing noncompliance are multifactorial for instance age, beliefs and duration of disease, complicated treatment dosage, information, multiple therapy, emotional factors, safety, acceptability and cost of treatment.

Methods of evaluating client compliance could either be direct (biological marker), which is usually real and painful or indirect (self-reporting, questionnaires, pill counts) (Guillausseau, 2005). The latter is often used, however, some clients may be unreliable source of information and this might result in inaccurate data. Example in Mason and colleagues’ study on the “Assessment of sulfonylurea adherence and metabolic control”, they observed that using electronic monitoring for client on sulfonylurea yielded compliance rate of 74.5% as against 92.4% of self- reported compliance (Mason, Matsuyam & Jue, 1995; Cramer, 2004).

In a systematic review of studies between 1966 and 2003, some researchers (Cramer, 2004) concluded that most diabetes patients do not take the regular dosage of their medications (Insulin and Oral Hypoglycemic Agents [OHA]) as ordered by the prescriber (Pugh, Anderson, Pogach & Berlowitz, 2003; Johnson, 1992), but they noted that the use of electronic method in monitoring people with diabetes enhanced adherence rate to 67- 85% (Cramer, 1995; Cramer, 1998). The prospective and retrospective studies reported that adherence to OHA ranged

between 36%- 93% for patients that remained on treatment for six (6) to twenty- four (24) months ((García-Pérez, Álvarez, Dilla, Gil-Guillén, & Orozco-Beltrán, 2013), a survey on the use of Insulin quoted 62- 64% adherence but a cohort study revealed that 80% of people with diabetes complied to insulin use for two (2) years (Brown, Nichol & Glauber, 1999).

From the review, it was noted that factors like age, complexity of treatment, duration of illness, depression and psychosocial issues influenced the diabetic clients' compliance to medication (Cramer, 2004). Adherence was poor among the adult aged beyond 50 years and also among children and adolescents and this lead to development of ketoacidosis in the younger group (Morris, Boyle, McMahon et al., 1997). With complexity of treatment; clients on daily medication regimen had compliance rate of 61% as compared to twice daily of 52% (Dezii, Kawabata & Tran, 2002; Paes, Bakker & Soe-Aagnie, 1997) and clients on single medication had 49% whilst those on multiple medication recorded 36% (Paes et al., 1997)). Depressed clients had lower compliance rates (85%) than non-depressed patients (93%) (Chiechanowski, Katon & Russo, 2000). The perception some participants had on the side effects of some drugs like insulin on the individual's physique (weight gain) also inhibited about 69% of women from adhering to treatment (Polonsky, Anderson & Lohrer, 1994).

With reference to the above review, the electronic method used to facilitate adherence was only applicable to diabetic patients on oral hypoglycemic agents to the neglect of diabetes patients on insulin and even the sample size for clients on OHA was limited to observation. In general, clients on OHA and insulin adhered poorly over extended periods of time of follow-up and this suggest that; it would be ideal for the

health team to revisit counselling of people with diabetes on how to improve adherence/compliance/persistence to treatment regimen than just increasing the dosages of drugs or changing the medication or adding more drugs when clients' blood glucose levels rise (Cramer, 2004; Rosen, Beauvais, Rigsby *et al.*, 2003; Spoelstra, Stolk, Heerdink *et al.*, 2003). In summary, diverse actions like simplifying treatments, educational strategies, high patient–health team interpersonal relationship, reminder systems and social support may lead to patient satisfaction and enhance adherence to treatment in type 2 diabetes patients. This would improve glycemic control and help reduce financial and economic burden on patient, health facility and the government.

2.4.3 Self- Monitoring of Blood Glucose

Self-monitoring of blood glucose (SMBG) is mostly acknowledged as a fundamental component of effective diabetic self-management (American Diabetes Association, 2010; Rodbard, Blonde & Braithwaite, 2007). A number of new studies, systematic reviews and meta-analyses have explored the relationship between SMBG and glycemic control from 1966 to 2004 (Sarol, Nicodemus, Tan & Grava, 2005) and from 1990 to 2006 (McAndrew, Schneider, Burns & Leventhal, 2007). They concluded that; SMBG may have a small influence on HbA1c in patients with type 2 diabetes (0.25%-0.40%) but this influence may be cost-effective (Palmer, Dinneen, Gray, Herman & Karter, 2006). However, few of these reviews examined how and for whom SMBG was effective. Additionally, a current Cochrane reviewed meta-analysis established that the overall effect of SMBG on glycemic control was small and most effective during the first 6 months after diagnosis (Malanda, Welschen, Riphagen, Dekker, Nijpels & Bot, 2012; St John, Davis, Price & Davis, 2010; Allemann, Houriet, Diem & Stettler, 2009; Poolsup, Suksomboon & Rattanasookchit, 2009).

Breland and her colleagues also obtained similar results when they conducted a systematic review of data between 2007 and 2011 to examine the association between self-monitoring of blood glucose (SMBG) and glycemic control in a Non- Insulin treated Type 2 Diabetes patients (Breland *et al.*, 2013). These researchers stated that; SMBG could be a useful tool for many but may not be appropriate for all patients with non-insulin-treated type 2 diabetes. Again, studies assessing the efficacy of SMBG within the framework of CSM advocated that; it is necessary to provide participants with information on how to effectively use SMBG but that is not enough if studies do not measure whether participants are using SMBG as intended and for whom this use is associated with better glycemic control (Malanda *et al.*, 2012; Clar *et al.*, 2010). Similarly, according to Polonsky (2011), structured SMBG yields significantly to improved glycemic control in insulin-naïve type 2 diabetic patients compared with patients who did not receive structured SMBG.

2.4.4 Foot Care

Health education on foot care in diabetes is essential and must be emphasized. It is important to explain to patients with diabetes that, foot problems though, being very common complications in people with diabetes, they can be prevented with careful foot care and even if they occur, clients' daily attention will ensure that the problems are detected before they become serious.

A study in Tanzania revealed that persons with diabetes need foot self-care. The researchers noted that the prevalence of diabetic foot was high among people with diabetes, and even patients who had received advice on foot care and in patients whose feet had been examined by a doctor at least once. There was evidence of 15 % foot

ulcers, 44 % peripheral neuropathy, and 15 % peripheral vascular disease. The researchers associated the findings with poor knowledge due to lack of formal education, diabetes duration and inadequate advice on foot care. It was noted that 48 % had received advice on foot care, and 27.5 % had their feet examined by a doctor at least once since their initial diagnosis (Chiwanga & Njelekela, 2015).

A systematic literature review of 30 articles indicated that DM related lower extremity complications could be improved through effective foot care interventions that include foot care knowledge and foot care. The researchers reported that preventing these complications, knowledge on risk factors, prevention of complication and being able to manage complications outside of the clinical setting was an important part of a diabetes foot self-care management program. Hence, the need to examine foot care interventions over multiple populations and geographical locations (Bonner, Foster, & Spears-Lanoix, 2016). Furthermore, a seven-year (2000-2007) cohort study with 572 diabetes patients in Costa Rica identified sex, years of diabetes, elevated glycated hemoglobin [HbA1c], retinopathy, insulin therapy, and prior amputation as possible risk factors for lower limb amputation. The results indicated that incidence of DM lower limb amputation was common among men diagnosed more than 10 years with HbA1c level greater than 8%, being managed with insulin and have diabetes related eye problems (Laculé & Valero-Juan, 2012).

Hämäläinen, Rönnemaa, Halonen, and Toikka (1999) also found that there was a strong association between lower extremity amputations and retinopathy, nephropathy, and neuropathy hence indicated that intensified measures be put in place when any of these complications manifest so as to prevent amputations. A retrospective analysis of amputation rates in persons with DM revealed that The DM Patients who were amputated were usually affected by foot

infections and kidney disorders as compared to the persons without DM. Foot ulcer was noted as the cause for about 88% of all DM related amputations. The researchers found that, men with DM had more foot infections and multiple amputations done as compared to the women. However the findings indicated that major amputations rate in DM patients were reduced after a consensus guidelines on foot care was implemented. The researchers concluded that if patients at high risk (example; male sex, kidney disease) of amputation are identified and preventive treatment offered early the rate of amputation would decrease substantially (Alvarsson, Sandgren, Wendel, Alvarsson & Brismar, 2012). Gambiaa, Gottlieb, Bergamaschi and Vianna (2004) were also of the view that diabetic treatment and regular review at the facility for diabetic health education and counselling sessions are essential for preventing foot amputation in DM clients.

With the above incidence, causal attribution and complication of neglecting foot care, diabetic clients must be made aware that, it takes time and effort for one to develop desirable foot care habits, but patient's self-care is necessary and the patient is a vital member of the medical team when it comes to foot care. People with diabetes must be educated on some risk factors like history of foot ulcer, nerve damage, poor blood circulation, and recurrent high blood sugar levels in the development of foot complications.

Some clinical manifestations like cold feet, poor/ weak pulses, thin or blue skin, and inadequate hair which signal lack of enough blood to the feet should be explained to clients with diabetes. Again, health education on skin changes (like excessive skin dryness, scaling, and cracking); an indication of compromised circulation to the skin and

unusual sensations in the feet and legs (e.g. pain, burning, numbness, tingling, and fatigue) which suggest nerve damage should be emphasized.

Furthermore, diabetes clients should be taught to abide by the following strategies as specified in clinical guideline (Alex, 2016) to reduce their chances of developing foot problems: keep the blood flowing to the feet, avoid activities that could injure the feet, be careful care when trimming the nails, check and wash the feet daily, choose socks and shoes carefully, be more active, go for foot examinations at least once a year and work closely with the health care team to keep blood glucose in the target range. Again clients should be encouraged to get involved in the battle to prevent foot complication by controlling their blood sugar levels to reduce the blood vessel and nerve damage which often lead to diabetic foot complications like amputation (Alex, ria, & 1-800-Diabetes, n.d.).

2.4.5 Risk-Reduction Behaviours

With respect to risk reduction behaviours like alcohol intake, the general population and diabetes patients have the same precautions they need to pay attention to (Stockwell, Zhao & Thomas, 2009). Alcohol intake should be minimal because ingestion of ethanol may mask the symptoms of hypoglycemia (Kerr, Macdonald & Heller, 1990). Some researchers encourage moderate intake of red wine in order to reduce the occurrence of myocardial infarction related inflammations (Marfella, Cacciapuoti & Siniscalchi, 2006) and to lower the blood pressure in clients with diabetic nephropathy (Nakamura, Fujiwara & Sugaya, 2009). However, high intake of ethanol or white wine (about 44 g) daily was linked to increased blood pressure in male clients with Type 2 diabetes (Wakabayashi, 2011).

People with diabetes report that making lifestyle changes is one of the greatest challenges they face in managing their diabetes (Stys & Kulkarni, 2007). Diet-related behaviors have a

direct impact on metabolic control and can be the most challenging of the self-care behaviors for patients and health care professionals (Lorenz et al, 1996).

Similarly, in a study conducted by Tuomilehto *et al.* (2001) on Prevention of Type 2 Diabetes Mellitus by Changes in Lifestyle among Subjects with Impaired Glucose Tolerance, there was evidence that type 2 diabetes can be prevented by lifestyle modifications among both men and women at high risk for the disease. Here the total incidence of diabetes reduced by fifty-eight percent (58%) however; the estimation of the intervention outcome was considered traditional because 1) data analysis was based on the intention-to-treat principle, despite the fact that some participants in the intervention group did not follow the recommendations about diet and exercise and 2) participants in the control group might have benefited from the general health advice that was given at the initial stage of the study and during the annual follow-up visits (Tuomilehto, Lindström, Eriksson, Valle, Hämäläinen, Ilanne-Parikka & Uusitupa, 2001).

Furthermore, some researchers stated that clients on insulin must be educated on the risks of hypoglycemia (complication) and potential weight gain as a result of alcohol intake. They advised that; in cases of low blood glucose level (with clinical manifestations like extreme hunger, sweating, fatigue, tremors, dizziness, headache, seizures and loss of consciousness if the earlier signs and symptoms go unchecked and treated), appropriate intervention like carbohydrate intake, regulation of insulin administration and regular blood glucose monitoring must be done to avert this complication (Pietraszek, Gregersen & Hermansen, 2010; Richardson, Weiss & Thomas, 2005).

Obese and overweight diabetic clients should be encouraged to take a nourished or balanced calorie reduced diet in order for them to meet their nutritional goals (Wing, 2010; Knowler, Barrett-Connor & Fowler, 2002). Clients with type 2 diabetes must be encouraged during diabetic health education sessions to eat at specific and regular intervals to maximize glucose control.

2.5 Factors that influence self-care among type 2 diabetes mellitus patients

When patients are involved in their care through self-management, the utmost goal of controlling and maintaining glycemic level is achieved. That is; interventions of self-care or self- management is associated with better clinical outcome (Cramer, 2004; Norris, Lau, Smith, Schmid, Engelau, 2002). But, self-management is quiet difficult to attain and maintained because of the complexity of the practices involved and the lack of motivation and technical knowhow (skills) on the part of some patients (Ofstedal, Bru & Karlsen, 2011).

Frequently reported barriers to self-management (Nagelkerk, Reick & Meengs, 2006; Pinhas-Hamiel & Zeitler, 2003) include knowledge deficits, poor patient-provider communication, low self-efficacy, limitations of time or resources, financial constraints, lack of individualized and coordinated care, and lifestyle differences among family members (Liu, Lee, & Brateanu, 2014). A broad review of 16 studies also identified barriers from five different perspectives: psychosocial, socioeconomic, physical, environmental and cultural (Pun, Coates & Benzie, 2009).

Similarly, a systematic review of 1454 articles published between 1990 and 2009 revealed that, patients' adherence, attitudes, beliefs, and knowledge about DM affects self-management. Other factors like cultural practices, languages and capabilities have influence on

the patients' health beliefs, attitudes, health literacy, thereby affecting diabetes self-management. Other factors may extend to patients financial resources, co-morbidities, and social support (Nam, Chesla, Stotts, Kroon, & Janson, 2011). Byers, Garth, Manley and Chlebowy (2016) also reported some barriers like lack of self-control related to food and dietary choices, confusion and forgetfulness and inconvenience of diabetes self-care (Byers *et al.*, 2016). However, social support from friends family members, peers, social network, healthcare providers has been identified as a facilitator of self-care practices (Byers *et al.*, 2016; Kadirvelu *et al.*, 2012; Byers *et al.*, 2010; Orr Chlebowy *et al.*, 2010; Rintala, Jaatinen, Paavilainen, & Åstedt-Kurki, 2013; Tang *et al.*, 2008; Ingram *et al.*, 2007; Gallant, 2003).

Abubakari, Jones, Lauder, Kirk, Anderson and Devendra (2011) also asserted that illness perceptions were critical in determining self-management among type 2 diabetic patients of African origin. Chlebowy, Hood and LaJoie (2010) also found a positive association between diet, physical activity, compliance with medication, testing for sugar and foot care on one hand and family and friends support on the other. Another group of researchers also observed that peer education in culturally sensitive areas often lead to improved glycemic levels as their knowledge level and self- management practices improve (Pérez-Escamilla, Hromi-Fiedler & Vega-López, 2008).

2.6 Effectiveness of self- care practices among type 2 diabetes patients

The CSM explains the effectiveness of Self- care management as it specified that patients are active problem solvers who use rational explanations of somatic and practical signs to understand and actively improve their health. In a cross sectional study among type 2 diabetes patients in China on the association between self-management barriers

and self- efficacy, researchers observed a negative correlation between the variables thus the higher the levels of self- management barriers, the more likelihood of showing a lower level of self- efficacy. However, a significant mechanism fundamental to the two (2) variables was not established (Cheng, Sit, Leung, & Li, 2016).

Findings of some researches have indicated that there is an association between self-care management and glycemic levels among DM patients (Hart & Grindel, 2010). Yet, some studies like Abubakari *et al.* (2011) and Compeán Ortiz *et al.* (2016) did not find any significant correlation between self-management and glycemic levels among white-British and black African population. In Compeán Ortiz *et al.*'s study there was evidence that all the participants (100%) had poor glycemic control ($HbA1c > 7\%$) however the variables for self -care example; adherence to medication and exercise were significantly correlated to glycemic level among Mexican adults with Type 2 DM.

In a broad review of 37 articles, Ashe, LaFleur and Corner (2011) found that majority (57%) of the studies (13 out of 23) indicated that better adherence was related to improved glucose control and decreased visit to the healthcare institutions. Ashe *et al.*, observed that the ability of the various studies to draw distinction between adherence and glycemic control recurred continuously (7 out of 9 studies, 78%) in studies that considered compliance in terms of prescription refills as compared to studies that used various constructs for patient re-counted compliance methods.

2.7 Patients' need for education and self-management of DM

Widely, people have the belief that educating patients about diabetes may be a way to help and encourage susceptible individual in assuming active responsibility for self-management. Based on this conception, several educational programs have been developed (Wagner,

Grothaus, Sandhu, Galvin, McGregor, Artz & Coleman, 2001; Trento, Passera, Borgo, Tomalino, Bajardi & Cavallo, 2004). This is a follow-up action in relation to the Common Sense Model which states, that illness perceptions influence coping strategies and coping intermediates the relationship between illness perceptions and health outcomes. Illness perceptions and coping strategies are anticipated to impact on health outcomes over and above the development of a biological disease. The need for diabetic education is essential to increase clients' knowledge base and make room for informed decision and effective client participation.

Diabetic education also called diabetes self-management education (DSME) or diabetes self-management training (DSMT) is defined as a two-way process by which diabetes clients gain the knowledge and skills required to adjust behavior and effectively self-manage the disease conditions (AADE, 2008, AADE, 2009).

Diabetic education is an interactive process made up of people with diabetes disease and a team of health educators for instance Nurses, Dietitians, and Medical Practitioners and Pharmacists. The interactive interventions aids clients to achieve optimal glycemic levels, reduce and control complications which in turn reduce cost of health care more especially in Ghana where Tax on cost of treatment (medication) had been increased to 33%.

Diabetic health education aims at improving the quality of life of people with diabetes. The health education on diabetes care given in our health facilities by the health team is very significant and must be transferred into action. Areas of health education should include the causes and risk factors of diabetes. The clinical manifestations example excessive thirst, excessive hunger, frequent urination, easy fatigability, infections and weight loss among others should be emphasized so as to prevent clients

from attributing their disease condition to spiritual connotation which really affect their attitudes towards self- care and subsequent management of the disease. Clients should be informed about the chronicity of diabetes and the grave consequences (like amputation, loss of sight, renal shut down, hypoglycaemic coma, death and what have you) associated with it in cases of non-adherence to treatment.

Health education on the management of diabetes should include nutritional therapy and counselling by a dietician or nutritionist. Research shows that education on nutrition is effective when given in a small group or on individual basis (one- on- one) and this act benefits both people with diabetes and those at risk of developing the disease (Rickheim, Weaver & Flader, 2002). Methods like hands on or practical activities, group discussion and role playing must be employed in group education to facilitate learning as they make group education much effective than individual counselling (Trento, Basile & Borgo, 2008). In one study, people with lower socioeconomic status preferred individual counselling (Robbins, Thatcher & Webb, 2008). However, some studies also suggest that nutrition counselling should be done individually depending on the patient's age, type and duration of one's condition, medication, treatment goals, preferences, beliefs, requirements, culture or philosophy, economic status, lifestyle (Glazier, Bajcar & Kennie, 2006), activity level, capabilities and one's readiness to change then evaluated frequently and reinforced in a rigorous manner (Norris, Engelgau & Narayan, 2001; Clement, 1995) with the information given out capturing all aspect of self-management.

Diabetic clients should also be alerted that; glycated hemoglobin level or blood glucose level can be reduced (1.0%- 2.0%) under the influence of dietary therapy (Gaetke, Stuart & Truszczyńska, 2006) as indicated by research findings but a combination of multiple factors under self- care with nutrition inclusive would lead to improved metabolic and clinical results

(for instance rate of patients' admitted to the clinical setting will reduce hence a decrease in the workload on clinicians then pressure on the facility and government to provide more infrastructure and drugs would eventually go down in the long term (Huang, Hsu & Wang, 2010; Imai, Kozai & Matsud, 2008).

With respect to physical activity or exercises, people with diabetes should be educated on the various form of exercises and motivated to set goals, take note of common barriers (weather condition, environmental hazards, time, patient's strength, lack of motivation, injuries) then develop actions to get over these hindrances (DeWalt, Davis & Wallace, 2009). Diabetic patients should be counselled on the need for and the therapeutic effects of taking their medications accurately and regularly. Being it injections (insulin) or oral (hypoglycemic agents); the effects of under dose and overdose must be spelt out to them. Due to the chronic nature of diabetes condition, patients must be encouraged at all times to comply with treatment regimen.

Reports on a systematic review of 72 studies in 84 articles by Norris et al suggested that, there exist some level of effectiveness of self- management training in type 2 diabetes especially in the short term. (Norris, Engelgau, & Narayan, 2001). Norris *et al.* (2002) also indicated that self- management education improves glycosylated haemoglobin levels when follow-up is immediate (0.76%) and this effect is increased with increased contact time in a meta-analysis of thirty one (31) studies. They stated that benefits reduced 1-3 months (0.26%) after the termination of intervention as learned behaviours change over time hence the need for development of interventions for the maintenance of long term glycemic control (Norris, Lau, Smith, Schmid, & Engelgau, 2002).

In response to Norris and colleagues' meta-analysis, which laid emphases on the effects of diabetes self-management education (DSME) on glycemic control in adult patients with type 2 diabetes in the short term but that its long-term effects still need to be determined in a study of randomized controlled intervention, Sone *et al.* (2002) conducted a study in Japan. They used randomized controlled trial to evaluate the long-term effects of DSME for 5 years among 2,205 adult patients with type 2 diabetes as suggested by Norris *et al.* Based on the large-scale, the researchers concluded that; the significant improvement produced by DSME on the glycemic control of adult patients with type 2 diabetes is also maintained in the long term (Sone *et al.*, 2002).

2.8 Summary

In summary, this chapter was made up of review of empirical literature. The first part was on how the search was done, search items used and various search engines used. The study employed Leventhal's Common Sense Model of Self-regulation of Health and Illness hence the review was done within this framework and based on the study objectives.

The next chapter is chapter 3 where the methodology and research methods are discussed.

CHAPTER THREE

RESEARCH METHODS

3.0 Introduction

This chapter of the study outlines how the research was carried out. It entailed a vivid description of the method and methodology used in achieving the stated objectives. It also detailed out the research design used, research setting, target population, sample size and sampling method, data collection instruments, instrument administration procedure, data analysis, data management and information on how ethical requirements were met.

3.1. Research Design

This research study used a quantitative approach specifically the exploratory cross sectional research design. Exploratory because the study aims at generating new ideas about patients' care, gather information for clarifying self-care concept in diabetes management. Survey; a method that enables the researcher to collect data directly from the study participants with a structured questionnaire or interview was employed. Self-administered questionnaires were used for participants who could communicate in English and interview for respondents who preferred to use local dialects (Ga, Ewe or Twi). Thus, these self-reports from clients were collected only at one point in time.

3.1.1 Research Setting

This research was conducted at the National Diabetes Management and Research Centre (NDMRC) of the Korle-Bu Teaching Hospital (KBTH). KBTH has been ranked the third largest in Africa and is located in the Ablekuma South Sub-Metropolitan area in Accra, Ghana. The hospital currently has a bed capacity of 2000 beds and is the leading national referral centre in

Ghana. It has 17 clinical and diagnostic departments/units with an average daily turnout of clients estimated at 1,500 and about 250 admissions. It is an accredited National Health Insurance Scheme hospital in the country. This enables all category of patients, regardless of their socio-economic status to access health care in their clinical and diagnostic departments.

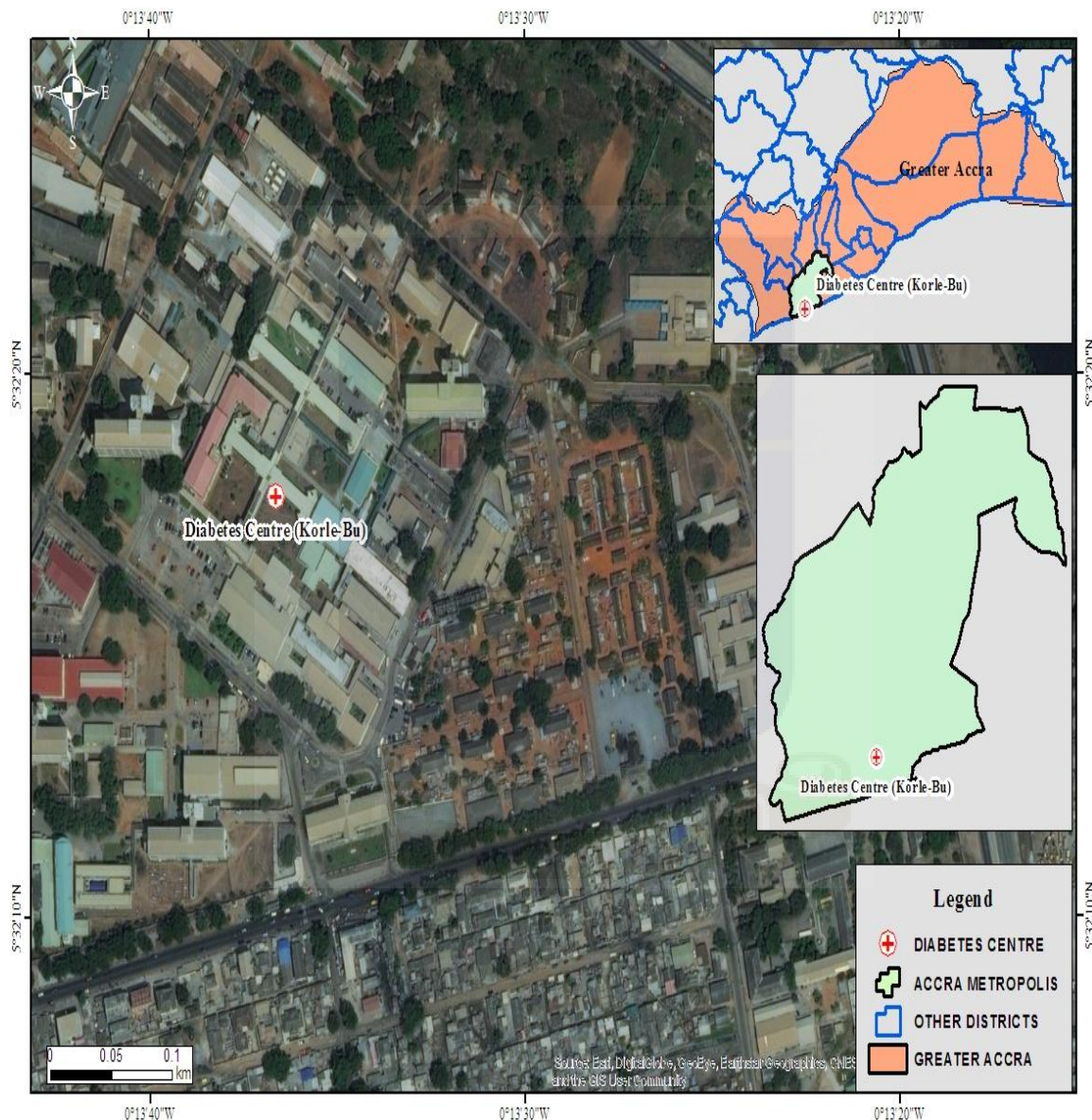


Figure 2. Map of National Diabetes Management and Research Centre – Korle Bu Teaching Hospital, Accra

Besides serving people from Greater Accra region, its' environs and other parts in Ghana, patients from neighboring countries in the sub-region of West Africa also benefit from the services of the hospital. The patient population is, therefore, diverse and fairly representative of the Ghanaian population. KBTH is one of the few hospitals in Africa where there is a National Diabetes Management and Research Centre (NDMRC) with well-equipped laboratory to meet the medical requirements and standards of diabetes care. Records from the hospitals' statistics on diabetes shows that 18, 707 patients do access the NDMRC with approximately 70 – 80 clients visiting the Centre daily (Monday to Friday) for diagnosis and management of diabetes. The Centre is managed by a team of highly qualified medical and paramedical staffs. This includes 3 Physician Specialists, 4 Medical doctors, 10 General nurses, 2 Ophthalmic nurses, a Dietician, 2 Biostatisticians, 3 National Health Insurance staffs, 8 Laboratory technicians and Biomedical scientists with expertise in diabetes management and 2 Orderlies

3.1.2. Study Population

Population is a group of people being the focus of a research study and to which the results is applied (Creswell, 2005). For the purposes of this research, the target population was made up of clients; both males and females diagnosed of Type 2 diabetes mellitus at the Korle Bu Teaching Hospital and are within the ages of 30 and 75 years.

3.1.2.1 Inclusion Criteria

Clients eligible for the study were people who:

- i. Were diagnosed with type 2 Diabetes Mellitus
- ii. Were within the ages 30-75 years
- iii. Had checked their glycated haemoglobin (HbA1c) levels within the last 12 months.

- iv. Attend diabetes clinic at KBTH-NDMRC
- v. Could speak and understand English, Ga, Ewe or any of the Akan languages (Akwapim, Asante, Akyem, Fante or Twi). This is because most inhabitants of the area understand and communicate well in the local dialects specifically Ga, Twi, Ewe and English. The researcher is equally fluent and very interactive in the selected languages.

3.1.2.2 Exclusion Criteria

Clients who did not qualify for the study were diabetes patients:

- i. Who were disorientated to time, place and person or in a state of confusion.
- ii. Whose health status were critical or unstable.
- iii. Who did not give their consent to participate in the research.

3.2 Sample Size

LoBiondo- Wood and colleagues defined a sample as a set of elements that make up the population and these elements are the most basic units about which information is collected. The elements could be people, places or objects. (LoBiondo- Wood, Haber, Cameron & Singh, 2012). The total population or sample frame of diabetes clients that attends the Outpatients' diabetes clinic at the NDMRC of the KBTH was about 18, 707. And using Yamane (1967) formular, a sample size of 392 participants was obtained.

$$n = \frac{N}{1 + N * (e)^2}$$

Where n = Sample size, N= Population size which is 18,707, e= Acceptable sampling error which is 0.05 at 95 % confidence level.

By substitution,

$$n = \frac{18707}{1+18707 \times (0.05)^2} = 391.626$$

Thus the sample size (n) for the study = 392 participants

The calculated sample size was 392 and in an attempt to make up for non-responsiveness of some participants and possible bias during data collection, the sample size was rounded off to 400. The study therefore engaged 400 participants. All the 400 participants recruited for this study either filled and returned their questionnaires or were interviewed expressive of a 100% response rate.

3.3 Sampling Method

This is the process of selecting a representative unit of a population (LoBiondo- Wood et al, 2012). For this study, the researcher purposively selected the NDMRC-KBTH. Purposive Sampling technique was used on the basis that the participants selected were deemed to have the characteristics considered appropriate for the study and from whom the needed data could be obtained. Following the selection of the Diabetic Centre, a convenience sampling technique was used to select 400 participants for the study. Self - selection of participants was subsequently done by the researcher. Thus, participants that were readily accessible, that had checked their glycated hemoglobin levels within the last one (1) year and have agreed to be involved in the study were used.

3.4. Research instrument or Data collection tool

A structured questionnaire (Appendix E) was used as the main data collection tool. Standard tools were adapted and modified to suit the objectives and methodology of the study. The tool was a combination of a demographic questionnaire and 3 other instruments namely; Revised Illness Perception questionnaire (IPQ-R) by Moss- Morris and colleagues (2002); Brief

COPE questionnaire by Carver (1997), and Diabetes Self-Care Management Questionnaire by Schmitt *et al.* (2013).

The questionnaire was divided into four sections with the following variables:

Section one focused on socio-demographic data with variables such as gender, age, weight, height, body mass index, house-hood size, occupation, marital status, religion, educational background, NHIS and respondent's medical history (onset of diabetes, number of years living with diabetes, type of diabetic treatment, fasting plasma glucose level [FPG], last glycated hemoglobin [HbA1c] result and family history of diabetes). Data on glycaemic levels (FPG and HbA1c), blood pressure (BP), weight and height were obtained from participants' folder (hospital electronic databases). Participants' BMI were calculated from weight in kilogram divided by height squared (height in metres) with the help of a calculator. The most recent HbA1c data (within the last 12 months) were used. HbA1c is a measure of average blood glucose level for the past two to three months. The values of HbA1c are expressed in percentages.

Section two contained Illness perception variables in the questionnaire – Revised (IPQ-R) which measured participants' illness representation or beliefs and emotional distress (opinion or knowledge on the disease condition). Identity was measured on a yes or no scale with 7 items and the remaining constructs measured on a 5-point Likert scale response format; 'strongly disagree' (1) to 'strongly agree' (5). This is to specify participants' level of perceived agreement or disagreement [causes-19 items, timeline (acute/chronic/ cyclical)-5 items, emotional reaction- 6 items, cure or control (personal and Treatment/medical) - 4 items, consequences- 6 items and illness coherence- 2 items].

Section three dwells on the Brief Cope variables in the questionnaire which had 16 items measuring the coping strategies or actions employed by the participants in managing their

disease condition. The Response used were scored from zero – three (0- 3) and the choices were ‘I do not apply or use this at all’ (never), ‘I use this a little bit’ (sometimes), ‘I use this a medium amount’ (often) and ‘I use this a lot’ (always) (Carver, Scheier, & Weintraub, 1989). The dimensions or subscales of the brief COPE used for this study are as follows: Active coping, Planning, Substance use, Use of emotional support, Use of instrumental support, Positive thinking/ reframing, Acceptance of responsibility, Religious coping, Denial, Venting of emotions, Behavioral disengagement, Humor and Self-blame.

Finally section four centers on Diabetes Self-Care Management variables or items in the questionnaire with 22 items measuring participants’ self-care activities [eating healthy diet - 4 items, performing exercise - 4 items, strict adherence to medication- 2 items, seeking proper medical care for diabetes - 2 items, self- monitoring of blood glucose level (SMBG)- 2 items, foot care- 4 items, risk reduction behaviours - 3 items and 1 item on participants’ perceptual total self- care as they thought about themselves over the previous 2 months. Here participants were required to indicate through a scale of 0-3, the extent to which they engage in self-care activities as they thought about themselves over the past two (2) months. Zero (0) represented Does not apply to me; One (1) applies to me to some degree/some of the time/ sometimes; Two (2) applies to me a considerable degree/ often and three (3) applies to very much/ most of the time/ almost always.

3.5 Instrument Administration Procedure

Three nurses were trained as research assistants to assist in the data collection process. On the days of data collection, the routine blood glucose test, Fasting Plasma Glucose (FPG) of all participants were checked by the biomedical scientists and laboratory technicians early in the morning at the Diabetes Centre. Questionnaires were administered by the researcher and the

research assistants to participants after the routine health education and as clients await to be reviewed by the Physician Specialist and the Medical Officers. Participants were approached with an invitation letter, participant's information sheet, and informed consent forms of the study. Patients who agreed to take part in the study were asked to sign the consent form and subsequently complete the study questionnaires. Participants who gave their consent and could interact in English completed the questionnaires on the spot. But clients who preferred to communicate in Ga, Ewe or Twi, the interaction took the form of structured interview where interviewers (researcher and research assistants) translated and interpreted questions on the questionnaire into the local dialect (Ga and Twi) for the people, solicited for answers from them, and provided the feedback on the papers as per each participant's response. Participants' blood glucose (FBS and HbA1c) values, blood pressure, weight, height, waist and hip circumference were recorded from their hospital folders. Diabetes clients with poor eye sights were also assisted with reading and completing the survey by the researcher.

The above procedure was repeated daily (Monday to Friday) until the total number of 400 participants was attained. Each participant was used only once for the survey. Each participant was used only once for the survey. The data was then analyzed using simple descriptive tools such as tables for the demographics and inferential statistics like Pearson correlation and hierarchical multiple regression model based on the Statistical Package for Social Sciences (SPSS Version 20).

3.6 Reliability and Validity

Reliability is the accuracy of a measuring instrument or the consistency of a measure of behaviour (Amponsah, 2010). Validity is the degree to which the researcher measures what he or she intends to measure (Amponsah, 2010). It is also the extent to which an instrument reflects the

concept being examined (LoBiondo- Wood *et al.*, 2012). For this study, the instrument used (Appendix D) was a combination of Revised Illness Perception Questionnaire [IPQ- R], Brief COPE questionnaire and Diabetes Self-Management Questionnaire [DSMQ]) adapted from Moss-Morris *et al.* (2002), Carver (1997) and Schmitt *et al.* (2013). These questionnaires were validated in Belgium, China and Germany with a cronchbach alpha of 0.89, 0.61-0.80 and 0.84 respectively (Arat, Zegel, Rillaer, Moons, Vandenberghe, De Langhe & Westhovens, 2016; Su, Lau, Mak, Choi, Feng, Xi Chen,...Cheng, 2015; Schmitt, Gahr, Hermanns, Kulzer, Huber & Haak, 2013).

The questionnaire was therefore a reliable and valid instrument which enhanced an efficient assessment of participants' perception on illness, coping strategies and self-care behaviours related to glycaemic control. Due to cultural differences in countries, the questionnaire was pre- tested before its administration for the study in Ghana.

Cronbach alpha for the questionnaire used for this study recorded IPQ-R: 0.76, Brief Cope: 0.57, DSMQ: 0.67. The overall general reliability coefficient was 0.768

3.6.2 Pre-testing

The questionnaire was pre-tested on 40 participants at Ejisu Municipal Hospital, Ashanti. This was done to test the practicability, clarity and consistency of the tool and also to help the researcher to estimate the time needed by the participants to fill the questionnaires. The necessary corrections were made before final administration to the participants at Korle Bu Teaching Hospital.

3.7 Data Analysis

Data were analysed using both descriptive and inferential statistics with the help of a computer and a software for windows; Statistical Package for Social Sciences (SPSS version

20.0). The Statistical methods employed were frequencies, percentages, means, standard deviations, Pearson correlations were used for establishing relationships between variables. Hierarchical multiple regressions was computed for predictor variables. The significance level for all the statistical tests carried out were 0.05 at 95% confidence level.

3.7.2 Data Management

Data was managed accordingly after data collection. A codebook was designed and used to create a database for data entry using SPSS version 20.0. Variables on the questionnaire (Master copy) were defined and labelled. Values or numbers (codes) were assigned to variables and all codes were mutually exclusive. Some variables example gender and ethnicity among others were recoded as dummy or dichotomous variables. The responses that were already numbered (self-coded) were maintained. Again, for each participant thus each questionnaire was coded (1-400). Data was then made ready for entry into the SPSS or spreadsheet by the researcher. The raw data on all the completed questionnaires were checked for double coding, incompleteness, unclear, double answers or inconsistencies. Codebook was displayed for the rules to be consistent and applicable to all participants.

Furthermore, data was entered appropriately into the SPSS software by the researcher and a statistician on different computers. The two entries were compared and raw data were also compared to data in SPSS to rule out errors in data entry. An explorative data analysis was carried out. That is descriptive statistics (minimum, maximum, mean, standard deviation, skewness and frequencies distribution table) were computed to identify problems such as outliers, non-normal distribution, a problem with coding, missing values and errors inputting the data. Minimum values were compared with the allowed range of values in the codebook. Mean

and standard deviations were examined and the values looked reasonable as compared to the variables. The N column was examined for missing variables.

From pre-entry checks and pre-analysis, fourteen (14) missing data were found at the item level. Five items on weight measurement were omitted by the researcher because five of the participants were amputees and their weight could not be measured with reference to the scale the Diabetes Centre was using hence their BMI could not be calculated too. Two items were missing on illness perception under symptoms. The remaining 2 missing items were in self-care practices. The Valid N (listwise) for all variables on the scale measure was 391 instead of 400. With respect to skewness, the values of the skewed statistics were within desirable range (-1 or +1) (Morgan, Leech, Gloeckner & Barrett, 2015) except for household size (1.487) and height (19.8) which were more positively skewed whilst family history of DM (-1.026) was negatively skewed. With regards to variables on the nominal scale, frequency tables exhibited no missing data. Data cleaning was done and as per the rule in the researcher's codebook; a questionnaire was to be discarded and rendered invalid when half of the items are blank. No questionnaire was considered invalid. Missing data was taken note off before the inferential statistics (Pearson correlation and hierarchical multiple regression) was computed.

The statistical output has been encrypted with a password and stored on researcher's computer. The hard copies of the data (answered questionnaires with the signed consent forms) are stored under lock and key in a cabinet at the researcher's office at Mampong Nursing and Midwifery Training College. The data would be destroyed after five (5) years.

3.7.3 Dissemination of results and publication policy

- i. Journal Publication
- ii. Presentation to my students at the Nursing and Midwifery Training College, Mampong-Ashanti.
- iii. Organize workshop at the National Diabetes Management and Research Centre (KBTH)
- iv. Presentation at conferences example Sigma Theta Tau

3.8 Ethical Considerations

To ensure the protection of human subjects, an ethical clearance was obtained from the Institutional Review Board of the Noguchi Memorial Institute for Medical Research, University of Ghana. An ethical clearance and Institutional approval was also sought and obtained from the Scientific and Technical Committee then the Institutional Review Board of Korle –Bu Teaching Hospital (KBTH). An introductory letter was obtained from School of Nursing, University of Ghana to the site of data collection, NDMRC of the Korle-Bu Teaching Hospital (KBTH) for permission to carry out the research which was accordingly granted.

Before data collection, all the procedures were explained to the participants so as to gain their consent to partake in the research. Participants were briefed on the following that:

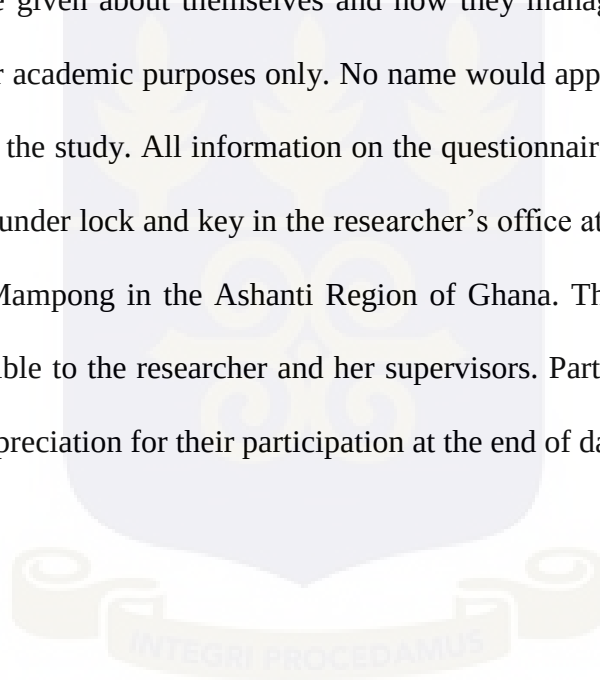
The study was not expected to pose any risk or discomfort to them and that the findings of the research would be published in academic journals.

The findings of study might not be of direct and immediate benefit to the participants but may impact clinical practice, education, research, policy making, which would ultimately benefit all diabetes indirectly in the future.

No fiscal or monetary compensation was to be given for taking part in the study however snack would be provided at the end of data collection.

Participation was voluntary thus participants have the right to take part in the study or refuse participation or withdraw from the study at any stage. If a participant decided not to take part in this research or pull out, there would be no penalty and the care or treatment the individual was receiving was not influenced by one's decision. Participants were permitted to back-out from the study at any point in time even after they have agreed to be part of the study or half way through answering of the questionnaires.

Finally, participants were assured of confidentiality, privacy and anonymity of whatever information they have given about themselves and how they manage their condition would be protected and used for academic purposes only. No name would appear on the questionnaire nor be used in any part of the study. All information on the questionnaires used for this study would be stored in a cabinet under lock and key in the researcher's office at the Nursing and Midwifery Training College at Mampong in the Ashanti Region of Ghana. The completed questionnaires would only be accessible to the researcher and her supervisors. Participants were provided with snack (2 apples) in appreciation for their participation at the end of data collection.



CHAPTER FOUR

FINDINGS

4.0 Introduction

This chapter is centered on the results of the study. The chapter is divided into six sections and begins with the socio-demographic characteristics of the participants. The remaining sections are presented according to the research objectives.

4.1. Socio-demographic characteristics of participants

The total of four hundred (400) participants participated in this study with a response rate of hundred percent (100%). From the study, majority of the participants ($n = 315$, 78.8%) were females followed by males ($n = 85$, 21.2%). The mean age of participants was 59 ($SD=9.7$) years with majority of the participants (33.3%, $n=133$) within the age group of 60-69 years. Most of the participants were married (60.5%, $n = 242$) followed by widows/widowers (24.5%, $n = 97$) with mean household size of 3.4 ($SD = 1.7$) members. Furthermore, most of the participants had some level of education (84.2%, $n = 337$) whilst only 15.8% did not have any form of formal education. One hundred and eighty eight (188) participants were engaged in active employment (47%) and a significant number of participants (34%, $n = 136$) had also retired from active service.

Majority of the participants (88.5%, $n = 354$) were Christians and forty two (42) were Muslims (10.5%). Most of the participants were active beneficiaries of the National Health Insurance scheme (97.8%). Majority of participants ($n=218$, 54.5%) had their glycated hemoglobin (HbA1c) level greater than 7% and were overweight ($n=153$, 38.3%) and obese ($n=139$, 34.8%). In addition, the major ethnic group (48.5%, $n = 194$) found among participants was the Akans ('Fantes', 'Akyems', 'Akuapems', 'Ashantis', 'Bono' and 'Larteh' inclusive)

followed by the Ga's (22.8%) with majority of the participants (91.8%, n= 367) living in the Greater Accra Region and nineteen (19) visiting the KBTH- NDMRC from the Central Region. Details of the socio-demographic characteristics of participants are presented in table 4.1 below.

Table 4.1 Socio-demographic Characteristics of Participants

Variable	Frequency	Percentage (%)
Sex		
Male	85	21.2
Female	315	78.8
Missing data	0	0
Marital Status		
Married	242	60.5
Single	16	4
Divorced/ Separated	45	11.3
Widow/ Widower	97	24.3
Missing data	0	0
Age		
30-39	10	2.5
40-49	67	16.8
50-59	126	31.5
60-69	133	33.3
70-79	64	16
Missing data	0	0
Educational level		
No formal education	63	15.8
Primary	35	8.8
JSS/JHS/Middle Sch.	125	31.3
SSS/SHS/Sixth Form	109	27.3
Tertiary	56	14
Vocational	12	3
Missing data	0	0
Type of Occupation		
Employed	188	47
Unemployed	59	14.8
Retired	136	34
Disabled	12	3
Petty trading	5	1.3
Missing data	0	0
Religion		
Christian	354	88.5
Muslim	42	10.5
Traditional	3	0.8

	Others	1	0.3
	Missing data	0	0
Household Size	1-3	243	60.8
	4-6	133	33.2
	7-9	22	5.5
	10-20	2	0.5
	Missing data	0	0
NHIS	Yes	391	97.8
	No	9	2.3
	Missing data	0	0
	Total	400	100
Family history of DM	Yes	291	72.8
	No	109	27.3
	Missing data	0	0
Region of Residence	Central	19	4.8
	Eastern	11	2.8
	Greater Accra	367	91.8
	Volta	1	0.3
	Northern	1	0.3
	Upper East	1	0.3
	Missing data	0	0
Ethnicity	Akan	194	48.5
	Ewe	55	13.8
	Ga	91	22.8
	Ga Adamgbe	9	2.3
	Guan	1	0.3
	Hausa	3	0.8
	Krobo	6	1.5
	Northerner	41	10.3
	Missing data	0	0
Glycated hemoglobin	HbA1c < 7%	182	45.5
	HbA1c > 7%	218	54.5
	Missing data	0	0
Body Mass Index	Underweight	1	0.3
	Normal range	102	25.5
	Overweight	153	38.3
	Class I Obese	92	23.0
	Class II Obese	33	8.3
	Class III Obese	14	3.5
	Missing data	5	1.3
Total		400	100

Source: Field data, 2017.

4.2 Medical History and health characteristics of Participants

Majority of participants (72.8%, n=291) revealed that, they have history of diabetes in their family. The mean age that participants were diagnosed of diabetes mellitus was 46.5 (SD =10.1) years whilst the mean years that participants were living with diabetes mellitus was 12 (SD = 7.4) years. The mean fasting blood sugar of participants was 8.2 (SD = 2.6) mmol/L whilst the mean glycated hemoglobin of participants was 7.9% (SD = 2.5). Two hundred and eighteen (218) participants had glycated hemoglobin level greater than seven percent (54.5%) and one hundred and eight two (182) participants had their glycated hemoglobin levels less or equal to 7% (45.5%). One hundred and fifty three (153) participants were overweight (38.3%), one hundred and thirty nine (139) were obese (34.8%) and one hundred and two (102) were of normal range (25.5%). The mean Body Mass Index (BMI) was 28.7 (SD = 5.4), which indicated poor weight control of most of the participants. Detailed description is illustrated in table 4.2 below.

Again, participants reported some complications of diabetes mellitus which they have developed. Majority of the participants reported most often to the health facility with neuropathy (63%), retinopathy (62%) and hypertension (52%). Detailed description is shown in table 4.3 below

Table 4.2 Medical history and health characteristics of participants

	N	Minimum	Maximum	Mean	SD
Age	400	32.0	75.0	59.0	9.7
Household Size	400	1.0	14.0	3.4	1.7
Fasting Plasma Glucose	400	3.1	16.0	8.2	2.6
Glycated Hemoglobin	400	3.0	16.9	7.9	2.5
Weight	395	44.3	127.0	76.2	15.2
Height of Respondent	400	1.4	156.0	2.0	7.7
Body Mass Index (BMI)	395	17.3	46.3	28.7	5.4
Age diagnosed of DM	400	1.0	72.0	46.5	10.1
Years with DM	400	1.0	41.0	12.0	7.4

Source: Field data, 2017.

Table 4.3 Complications of participants

Complications	Frequency	Percentage (%)
Amputation	5	1.3
Candidiasis	1	0.3
Ear impairment	1	0.3
Foot Ulcer	8	2
Foot Ulcer, Neuropathy	1	0.3
Hypertension	52	13
Hypertension, Retinopathy	2	0.5
Hypertension, Severe Wasting	1	0.3
Erectile Dysfunction	3	0.8
Erectile Dysfunction, Neuropathy	1	0.3
Erectile Dysfunction, Retinopathy	2	0.5
Neuropathy	63	15.8
Neuropathy, Retinopathy	1	0.3
Periodontal disease	1	0.3
Retinopathy	62	15.5
Severe Wasting	5	1.3
Stroke	1	0.3
No complication	190	47.5
Total	400	100

Source: Field data, 2017.

4.2 Illness perception of people living with type 2 Diabetes

The first objective was to assess the illness perception of people living with type 2 diabetes on their disease condition and its' management. This was achieved by adapting the Leventhal's Common Sense Model of Self - Regulation of Health and Illness.

The results show that the total mean score 83.2 (SD = 8.9) for illness perception was high. This implies that participants have high knowledge about their disease condition and its' management. The mean score for identity was 5.5 (SD = 1.4) which is high indicating that; participants have high perception or high knowledge level on the symptoms of diabetes mellitus. Similarly, the mean score for timeline was 15.8 (SD = 29) relatively high indicating participants view their illness as somewhat chronic in nature. With respect to consequences; the mean score was 22.1 (SD = 3.3) which is also relatively high indicating that; the participants perceived diabetes illness to have severe negative consequences on the psychological, physical, economic and social wellbeing of the individuals affected with it. Furthermore, the mean score for personal control 7.7 (SD=1.8) and treatment control 10.5 (SD = 1.8) were high indicating that, participants held the positive beliefs about their personal and medical or treatment controllability or curability of diabetes illness. Similarly, the mean scores for illness coherence was relatively high 7.1 (SD =1.9) which indicates that; participants reported a high level of understanding about their disease condition.

However, the mean scores for emotional representations 14.7 (SD = 4.5) was below average which indicate that; participants had low beliefs or knowledge that DM could make them suffer from emotional instability/distress for example being in a state of depression, anxiety, fear or anger. The total mean score of 54.19 (SD = 8.98) for

participants' perception on the causes of diabetes mellitus revealed that; they have high knowledge on the factors that leads to the occurrence of the DM. The most commonly identified agent of causation was diet or eating habit with a mean score of 4.35 (SD = 0.96). This was followed by hereditary with a mean score of 3.98 (SD = 1.38), my own behavior with a mean score of 3.55 (SD = 1.27) and alcohol 3.55 (SD = 1.51). Quite a number of participants (mean score=2.44, SD=1.0) also believed that diabetes mellitus was caused by evil eyes or the illness was a spiritual one. Participants perceived chance or bad luck to be the least cause of diabetes mellitus condition with a mean score of 1.86 (SD = 0.9).

Additionally, participants recalled high knowledge on some symptoms (mean score = 5.5, SD = 1.4) related to diabetes condition. The three most perceived symptoms identified by participants were hyperglycemia 0.99 (SD =0.09), changes in vision 0.90 (SD = 0.30) and hypoglycemia 0.89 (SD = 0.31). The detailed analyses is shown in the table 4.4 below.

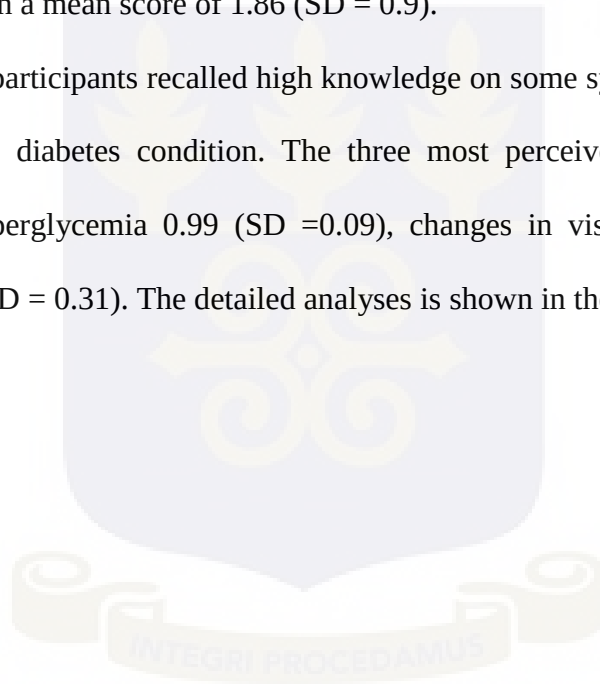


Table 4.4 Illness perception and causation of DM

Variable	Possible range	Observed range	M	(SD)
Illness representations				
Identity	0-7	1-7	5.5	1.4
Timeline (acute/chronic/ cyclical)	5-25	8-25	15.8	2.9
Consequences	6-30	10-30	22.1	3.3
Personal control	2-10	3-10	7.7	1.8
Treatment control	3-15	5-15	10.5	1.8
Illness coherences	2-10	2-10	7.1	1.9
Emotional representation	6-30	6-30	14.7	4.5
Total score	24-127	60-113	83.2	8.9
Causes of DM				
Diet or eating habit	1-5	1-5	4.35	0.96
Hereditary	1-5	1-5	3.98	1.38
Own behavior	1-5	1-5	3.55	1.27
Alcohol	1-5	1-5	3.55	1.51
Respondents' personality	1-5	1-5	3.3	1.28
Ageing	1-5	1-5	3.18	1.32
Smoking	1-5	1-5	3.1	1.52
Stress or Worry	1-5	1-5	3.08	1.25
Emotional state	1-5	1-5	2.92	1.19
Poor medical care in the past	1-5	1-5	2.82	1.03
Overwork	1-5	1-5	2.76	1.19
Family problems or worries	1-5	1-5	2.49	1.12
Spiritual/Evil eye	1-5	1-5	2.44	1.0
Altered Immunity	1-5	1-5	2.38	1.01
Mental attitude	1-5	1-5	2.3	0.97
Accident or Injury	1-5	1-5	2.19	1.19
Pollution in the environment	1-5	1-5	1.97	0.84
A germ or virus	1-5	1-5	1.86	0.83
Chance or bad luck	1-5	1-5	1.86	0.9
Total Score	19-95	32-86	54.19	8.98
Symptoms of DM				
Hyperglycemia	0-1	0-1	0.99	0.09
Changes in Vision	0-1	0-1	0.90	0.30
Hypoglycemia	0-1	0-1	0.89	0.31
Numbness	0-1	0-1	0.84	0.37
Fatigue	0-1	0-1	0.83	0.37
Anxiety	0-1	0-1	0.52	0.50
Infection	0-1	0-1	0.51	0.50
Total Score	0-7	1-7	5.5	1.4

Total score is sum of scores of the all the constructs under illness representation and causes. Causation subscale: A 5-point Likert scale response format was used: 'strongly disagree' (1) to 'strongly agree' (5), to indicate their level of perceived agreement or disagreement on whether the 18 attributes listed were causes of diabetes mellitus. Participants used a 'Yes/No' response format for Illness representation (identity).⁷ Sub-scales for Illness identity.

4.3 Coping strategies of participants in managing Type 2 Diabetes Mellitus

The second objective was to assess the coping strategies of type 2 diabetes patients in the management of their condition. Coping strategies is part of the Leventhal's common sense model employed in this study. The brief cope questionnaire consisting of 28 items was used to address this part of the study. For the purposes of this study, the coping strategies considered included active coping (I make up my mind to fight DM and Use of herbal medication), dependence/substance abuse (use of alcohol), Seeking social support, behaviour disengagement (attempt to give up on self-care behaviours), planning (plan for future review and self-care practices), venting of emotions (expression of negative feelings when symptoms persist), denial (refusal to believe I have diabetes), positive thinking (always hoping there will be a cure one day), humor (I make jokes on how hard it is for me to control my condition), Acceptance of responsibility (I accept the reality that complication may develop if nothing is done), religious coping and fatalism/self-blaming (I have been criticizing myself).

Results from the analysis showed that; the total mean score 23.58 (SD = 3.88) recorded for coping strategies was moderate indicating a relative adoption of these coping strategies by participants. Participants recorded relatively high mean scores in behaviour disengagement (attempt to give up on self-care behaviours) 2.59 (SD = 0.68), denial (refusal to believe the individual has diabetes) 2.22 (SD = 1.06), planning (I plan for future review and self-care practices) 2.15 (SD = 0.91), positive thinking (always hoping there will be a cure one day) 2.44 (SD = 0.81), Acceptance of responsibility (Acceptance of reality that numerous complications may develop if I don't control DM) 2.43 (SD = 0.83) and religious coping 2.49 (SD = 0.84) indicating high participation or usage of those coping styles.

However, dependence/substance abuse (use of alcohol) recorded mean score of 0.13 (SD = 0.36) which is low indicating that very few participants took in/depended on alcohol as a coping style/tool in their management of DM. Table 4.5 shows details of analysis.

Table 4.5 Coping strategies of participants in managing Type 2 Diabetes Mellitus

Coping Variables	Possible score	Observed score	Mean	S.D
Active coping (I make up my mind to fight DM and Use of herbal medication)	0-6	0-6	2.96	0.99
Dependence/Substance abuse (I use alcohol and other drugs to make myself feel better)	0-3	0-2	0.13	0.36
Seeking social support	0-12	0-12	4.93	2.55
Behavior disengagement (Attempt to give up on self-care)	0-3	0-3	2.59	0.68
Planning (I plan for future review and self-care practices)	0-3	0-3	2.15	0.91
Denial (I refuse to believe I have DM)	0-3	0-3	2.22	1.06
Venting of emotions (I express negative feelings when symptoms persist)	0-3	0-3	0.47	0.70
Positive thinking (I keep hoping there will be a cure)	0-3	0-3	2.44	0.81
Humor (I make jokes on how hard it is to control DM)	0-3	0-3	0.32	0.64
Acceptance of responsibility (I accept the reality that numerous complications may develop if I don't control DM)	0-3	0-3	2.43	0.84
Religious coping strategy	0-3	0-3	2.49	0.84
Self-blaming/ Fatalism (I've been criticizing myself)	0-3	0-3	0.45	0.81
Total coping scores	0-48	13-36	23.58	3.88

Higher scores indicate greater use of coping strategy

Source: Field data, 2017.

4.4 Self-care practices among Type 2 Diabetes Mellitus patients

The third objective was to explore the self-care management practices among types 2 diabetes patients. Participants were required to indicate through a scale the extent to which they engage in self-care activities as they thought about themselves over the past 2 months.

Total self-care activity score ranged from 13-44 with a mean of 25.38 (SD = 5.52) indicating a moderate participation level in self-care activities. From the study, the mean score for eating healthy diet 5.19 (SD = 1.65) was moderate indicating that participants' self-care activities towards their eating habit was quite good. This was due to the high knowledge level held by participants that DM is caused by unhealthy diet or eating habit (mean score 4.35, SD= 0.96) coupled with their high beliefs that they could personally control their glycemic level hence they developed positive attitude towards taking healthy diet.

Similarly, the mean scores for participants' adherence to medication or medical treatment 3.28 (SD = 0.94) and seeking proper medical care 3.36 (SD = 1.07) were moderate indicating their self-care activities in the areas of taking medications (insulin and or oral hypoglycemic agent) as prescribed and seeking proper medical care for diabetes and other health related problems were good. This probably was due to the strong beliefs that participants had in relation to medical or treatment control (mean score of 10.5, SD = 1.8), the chronicity of DM (mean score = 15.8, SD = 2.9) and the severity (mean score = 22.1, SD = 3.3) of DM together with the fact that majority of the participants (n=210, 52.5%) have developed complications.

However, the mean scores for Self-monitoring of blood glucose 1.58 (SD = 1.74) was low indicating that participants self-care activities in monitoring of their sugar level was low. This finding is due to the fact that majority of participants (n= 207, 51.8%) were not in gainful

employment (unemployed, retirees and disabled) hence could not afford the expenses of buying glucometer, test strips and lancets for pricking in SMBG.

Also, the mean score for performing exercise 4.11 (SD = 1.67), foot care 4.87 (SD = 2.68) and risk reduction behaviours 0.90 (SD = 0.89) were all low indicating that; participants' self-care activities in the areas of exercise, foot care and risk reduction behaviours were very low. The mean age of participants was 59 (SD = 9.7) and most of the participants (n=197, 49.25%) were above 60 years hence their strength could not support them to engage in active physical activity and daily foot care which are components of risk reduction. Details are presented in table 4.6 below.

Table 4.6 Self-Care practices among Type 2 Diabetes Mellitus patients

Self-care variables	Possible score	Observed score	Mean	Std. Deviation
Self-monitoring of blood glucose	0-6	0-6	1.58	1.74
Eating healthy diet	0-12	0-10	5.19	1.65
Seeking proper medical care	0-6	0-6	3.36	1.07
Strict adherence to medication	0-6	0-6	3.28	0.94
Performing exercise	0-12	1-12	4.11	1.67
Foot care	0-12	0-12	4.87	2.68
Risk reduction behaviours	0-9	0-4	0.90	0.89
Total Self-care	0-3	0-3	2.10	0.89
Total self-care scores	0-66	13-44	25.38	5.52

Source: Field data, 2017.

4.5 Factors influencing self-care practices among Type 2 Diabetes Mellitus patients

The fourth objective was to determine factors that influence self-care among type 2 diabetes patients. A hierarchical multiple regression was computed to determine if illness perception and coping strategies of participants have any significance in predicting

their self-care behaviors. The dependent variable (self-care) and independent variables (illness perception and coping strategies) were measured using interval scale.

The hierarchical multiple regression results shows that, the overall model significantly predicted the dependent variable, self-care behaviour [$R^2 = 0.371$, $F_{(8, 372)} = 9.85$, $p=0.001$]. The model accounted for 37% of variance in the dependent variable, self-care practices. This means the illness perception and coping strategies can only explain 37% of change in participants' self-care practices or self-care activities. The study first examined whether demographic characteristics will have any significant effect on participants' participation in self-care activities. The regression analysis indicated that the demographic characteristics (sex, household size, JHS education, tertiary education and employment status) jointly explained 6.9% of the variation in self-care activities of participants

[$R^2 = 0.069$, $F_{(5, 387)} = 5.745$, $p = 0.001$]. This means that to some extent demographic characteristics are contributory factors to self-care practices in DM as it accounts for 6.9% change in self-care management.

In the second model, illness perception of participants was added and its' effect examined on self-care behavior. Illness perception variables (identity, consequences, personal control, medical/treatment control, illness coherence, timeline and emotional representation) jointly explained 24.4% of variation in self-care practices [$R^2 = 0.244$, $F_{(7, 380)} = 12.585$, $P = 0.001$]. Out of the seven variables, five (5) variables significantly contributed to the variations in self-care behavior of participants. Again, out of the five significant predictors, four were positive predictors whilst one was a negative predictor. Identity was negatively significant contributing to 15% of variance in the self-care behavior ($B = -0.15$, $P = 0.001$) which implies that greater knowledge about the symptoms of diabetes predicted lower self-care behavior. In other words

high knowledge on diabetes symptoms was somehow a barrier to the participants' self-care practices. Other beliefs example that of consequence and medical control negatively affected participants' engagement in self-care activities but they were not significant.

Personal control significantly contributed to the model by accounting for 29% of the change in self-care behavior ($B = 0.29$, $P = 0.001$). Thus participants who believed that they have vital roles to play in controlling their glucose levels would highly participate in self-care activities. The change caused by personal control could be attributed to the educational level of participants which could have positively influenced their self-esteem and attitude to engage in better self-care practices. Similarly, illness coherence was significant in the model contributing to 11.7% of variance in self-care behavior ($B = 0.117$, $P = 0.024$). Meaning greater understanding of participant's diabetes condition would lead to increase use of self-care behaviours. The contribution of illness coherence may be due to participants regular visit to the Diabetes Centre in their quest of seeking for proper medical care. During these clinic days, health education is given on various aspect of DM and participants become more enlightened. Also the mean number of years that participants have being living with DM is 12 years and this can make them more knowledgeable. Also majority of participants ($n=337$, 84.2%) had some level of education (junior high school, tertiary and vocational). Elite people tend to have better understanding of disease conditions and their management hence would be able to participate more in self-care activities.

Similarly, timeline (chronic) was significant in the model contributing to 11.5% of variations in self-care ($B = 0.115$, $P = 0.032$) that is greater acceptance of the chronic nature of diabetes predicted greater engagement in self-care activities. Furthermore,

emotional representations was significant ($B = 0.111$, $P = 0.019$) and contributed to the model by accounting for 11.1% change. With high perception that DM could cause emotional distress such as depression, anger, worries, anxiety and fear; participants would be more involved in self-care practices.

The third model examined the effect of coping strategies that is dependence/substance abuse (use of alcohol), seeking social support, planning (plan for future review and self-care practices), venting of emotions (expression of negative feelings when symptoms persist), denial (refusal to believe I have diabetes), positive thinking (always hoping there will be a cure one day), humor (I make jokes on how hard it is for me to control my condition), and acceptance of responsibility (I accept the reality that complication may develop if nothing is done).

In the third model, coping strategy was added and the variables of coping strategy collectively significantly accounted for 37.1% of variation in self-care practices [$R^2 = 0.371$, $F_{(8, 372)} = 9.85$, $P = 0.001$]. This means that adoption of coping strategies can only explain approximately one third of changes in the participants' self-care practices. Out of the eight variables considered, only three were statistically significant. Seeking social support accounted for 30.2% of variance in self-care ($B = 0.302$, $P = 0.001$) thus, increasing social support from friends, family members and other diabetes patients enhances the likelihood of self-care practices in the participants. Expression of negative feelings (Venting) also significantly contributed to the model by accounting 10.6% of variation in self-care ($B = 0.106$, $P = 0.03$) thus venting is associated with better self-care.

However, denial was negatively significant contributing 8.4% of variance in self-care ($B = -0.084$, $P = 0.05$) thus denial predicted lower levels of self-care behavior. This result could be accounted for by participants' perception that DM is caused by spiritual means or the evil eye

which puts them in a denial state. Hence participants drift to spiritual intervention example prayer and belief in God to change their unhealthy practices and bring down the glucose level to the neglect of practicing self-care. Details of the analysis are illustrated in table 4.7.



Table 4.7 Hierarchical multiple regression for variables that influence self-care practices

Model	Predictors	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	r
		B	Std. Error	Beta			
1	Demographic variables						
	(Constant)	25.272	0.697		36.26	0.000	
	Sex	-0.663	0.686	-0.049	-0.966	0.334	-0.049
	Household size	-0.203	0.155	-0.064	-1.306	0.192	-0.066
	JHS education	2.285	0.603	0.193	3.788	0.000	0.189
	Tertiary education	3.662	0.863	0.223	4.244	0.000	0.211
	Employed	-0.694	0.545	-0.063	-1.274	0.203	-0.065
Model summary: $R^2=0.069$, Adj. $R^2=0.057$, $\Delta R^2=0.069$, $F=5.745$ ($p=0.001$)							
2	Illness representation						
	(Constant)	16.491	2.692		6.126	0.001	
	Sex of Respondent	-1.068	0.629	-0.079	-1.7	0.090	-0.087
	Household size	-0.268	0.143	-0.085	-1.871	0.062	-0.096
	JHS education	1.866	0.554	0.158	3.367	0.001	0.17
	Tertiary education	3.142	0.791	0.191	3.974	0.001	0.2
	Employed	-0.686	0.501	-0.062	-1.369	0.172	-0.07
	Identity	-0.61	0.19	-0.15	-3.207	0.001	-0.162
	Consequence	-0.06	0.081	-0.035	-0.732	0.465	-0.038
	Personal control	0.878	0.165	0.29	5.311	0.001	0.263
	Medical control	-0.062	0.147	-0.02	-0.417	0.677	-0.021
	Illness coherence	0.349	0.153	0.117	2.274	0.024	0.116
	Timeline (chronic)	0.218	0.101	0.115	2.158	0.032	0.11
	Emotional representation	0.135	0.057	0.111	2.347	0.019	0.12
Model summary: $R^2=0.244$, Adj. $R^2=0.22$, $\Delta R^2=0.175$, $F=12.585$ ($p=0.001$)							

3	Coping strategies						
	(Constant)	21.535	3.212		6.705	0.000	
	Sex	-1.056	0.596	-0.078	-1.773	0.077	-0.092
	Household size	-0.286	0.136	-0.09	-2.104	0.036	-0.108
	JHS education	2.043	0.518	0.173	3.945	0.001	0.2
	Tertiary education	2.118	0.758	0.129	2.794	0.005	0.143
	Employed	-0.686	0.463	-0.062	-1.481	0.14	-0.077
	Identity	-0.519	0.179	-0.127	-2.899	0.004	-0.149
	Consequence	-0.095	0.076	-0.056	-1.244	0.214	-0.064
	Personal control	0.646	0.159	0.213	4.071	0.000	0.207
	Medical/Treatment control	-0.212	0.14	-0.068	-1.509	0.132	-0.078
	Illness coherence	0.336	0.143	0.113	2.342	0.02	0.121
	Timeline	0.142	0.098	0.075	1.448	0.148	0.075
	Emotional representation	0.007	0.058	0.006	0.121	0.904	0.006
	Substance abuse	0.586	0.66	0.038	0.887	0.375	0.046
	Seeking social support	0.66	0.097	0.302	6.779	0.000	0.332
	Behavior disengagement	-0.636	0.374	-0.077	-1.701	0.09	-0.088
	(Attempt to give up)						
	Planning (Plan for the future)	-0.469	0.305	-0.078	-1.539	0.125	-0.08
	Denial	-0.442	0.226	-0.084	-1.957	0.051	-0.101
	Venting of emotions	0.85	0.391	0.106	2.176	0.03	0.112
	(Express negative feelings)						
	Positive thinking (Positive	0.44	0.294	0.065	1.498	0.135	0.077
	Re-appraisal)						
	Humor (Adaptive coping)	0.427	0.376	0.049	1.135	0.257	0.059

Model summary: $R^2=0.371$, Adj. $R^2=0.337$, $\Delta R^2=0.127$, $F=9.38$ ($p=0.001$)

Dependent variable: Self-care participation Criterion level: 0.05 at 95% confidence level.

Source: Field data, 2017.

4.6 Effectiveness of self-care practices

The fifth objective was to determine the effectiveness of self-care practices among type 2 diabetes patients. To achieve this, the study employed the Pearson correlation and hierarchical multiple regression model to establish whether self-care practices (independent variable) among participants have any significant effect on their glycated hemoglobin level.

The correlation analysis showed that, there was generally a weak correlation between self-care practices and glycated hemoglobin levels. Again, out of the eight self-care practices, only two self-care practices were significant. From the results, risk modification was found to significantly correlate with glycated hemoglobin levels. The correlation coefficient of risk modification ($r = 0.210$, $P = 0.001$) revealed that positive changes in lifestyle were associated with higher glycated hemoglobin levels (poor glycemic control). Additionally, total self-care was found to significantly correlate negatively with glycated hemoglobin levels. The correlation coefficient of total self-care ($r = -0.391$, $p = 0.001$) showed that; higher total self-care practices were associated with lower glycated hemoglobin levels (good glycemic control). This might have been attributed to the high illness perception and high coping strategies adopted by participants in this study. Although not significant; self-monitoring of blood glucose levels, healthy diet, seeking proper medical care, performing exercise and foot care negatively correlated with glycated hemoglobin levels whiles strict adherence to medication positively correlated with glycated hemoglobin levels. The details are presented in table 4.8 below.

Table 4.8 Pearson correlation between self-care practices and glycated hemoglobin level

Variable	R	2-tailed sig
SMBG	-0.008	0.876
Healthy diet	-0.061	0.221
Seeking proper medical care	-0.085	0.091
Strict adherence to medication	0.056	0.268
Performing exercise	-0.075	0.134
Foot care	-0.08	0.112
Risk modification	.210**	0.000
Total self-care	-.391**	0.000

**** Correlation is significant at the 0.01 level (2-tailed).**

With a hierarchical multiple regression, results indicated that the overall model statistically significantly predicted the dependent variable, HbA1c level.

$$[R^2 = 0.193, F_{(8, 387)} = 9.502, P = 0.001]$$

The independent variable (self-care measured under eight constructs – seeking proper medical care, performing exercise, risk reduction behaviours, foot care, health diet, self-monitoring of blood glucose, strict adherence to medication, and total self-care) was measured on an interval scale whilst the dependent variable was acquired from the health facility database.

The model at first considered the effect of demographic characteristics (age and number of years with diabetes) on glycated hemoglobin level. The results indicated that age ($P=0.001$) and years living with diabetes ($P=0.015$) has a negative and positive significant effect by 19.5% and 13.2% respectively on glycated hemoglobin level. This implies that older participants exhibited poor glycemic control (higher levels of glycated hemoglobin) than their younger counterparts. And an increase in the numbers of years that participant lives with diabetes exhibited higher glycated hemoglobin levels (poor glycemic control). This is surprising because the longer an individual lives with the disease, the more information and knowledge the individuals acquire through counselling

and health education session however, this is possible when patients becomes complacent or get tired of their disease condition, they are likely to be insensitive to self-care practices and demands of the disease condition hence poor glycemic control. Similarly, demographic characteristics together explained significantly 3.4% variance in the glycated hemoglobin (HbA1c) level [$R^2 = 0.034$, $F_{(2, 395)} = 7.031$, $P = 0.001$]. This presupposes that; demographic characteristics influenced glycated hemoglobin level.

Furthermore, self-care practices (seeking proper medical care, performing exercise, risk reduction behaviours, foot care, healthy diet, self- monitoring of blood glucose, strict adherence to medication and total self-care) jointly explained significantly 19.3% of the variance in glycated hemoglobin levels of participants [$R^2 = 0.193$, $F_{(8, 387)} = 9.502$, $P = 0.001$]. However, only total self-care had a unique significance in the model by accounting for 35.5% of variance in glycated hemoglobin level of participants ($B = -0.355$, $P = 0.001$) thus patients who are better in taking good care of themselves with respect to self-care practices significantly have reduced glycated hemoglobin levels. Other self-care constructs: seeking proper medical care ($B = -0.052$, $P = 0.267$), performing exercise ($B = -0.04$, $P = 0.425$), foot care ($B = -0.034$, $P = 0.496$), healthy diet ($B = 0.068$, $P = 0.188$), self-monitoring of blood glucose ($B = 0.009$, $P = 0.853$), strict adherence to medication ($B = 0.023$, $P = 0.636$) and risk reduction behaviour ($B = 0.058$, $P = 0.249$) did not have any significant effect on glycated hemoglobin level. The details are shown in table 4.9 below.

Table 4.9 Hierarchical multiple regression of self-care behavior on glycated hemoglobin

Model	Predictors	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	r
		B	Std. Error	Beta			
1	Demographic variables						
	(Constant)	10.3	0.765		13.47	0.000	
	Age of Respondent	-0.05	0.014	-0.195	-3.593	0.000	-0.178
	Number of years living with Diabetes	0.044	0.018	0.132	2.446	0.015	0.122
Model summary: $R^2=0.034$, Adj. $R^2=0.029$, $\Delta R^2=0.034$, $F=7.031$ ($p=0.001$) [$R^2 = 0.034$, $F_{(2, 395)} = 7.031$, $P= 0.001$]							
2	Self-care behavior						
	(Constant)	12.598	0.986		12.777	0.000	
	Age of Respondent	-0.036	0.013	-0.142	-2.791	0.006	-0.14
	Number of years living with Diabetes	0.041	0.017	0.123	2.426	0.016	0.122
	Self-monitoring of blood glucose	0.013	0.068	0.009	0.185	0.853	0.009
	Healthy diet	-0.102	0.077	-0.068	-1.32	0.188	-0.067
	Seeking proper medical care	-0.121	0.109	-0.052	-1.112	0.267	-0.056
	Strict adherence to medication	0.06	0.126	0.023	0.474	0.636	0.024
	Performing exercise	-0.059	0.074	-0.04	-0.799	0.425	-0.041
	Foot-care	-0.031	0.046	-0.034	-0.682	0.496	-0.035
	Risk reduction behaviours	0.161	0.139	0.058	1.154	0.249	0.059
	Total Self-care	-0.992	0.139	-0.355	-7.147	0.000	-0.341
Model summary: $R^2=0.193$, Adj. $R^2=0.172$, $\Delta R^2=0.159$, $F=9.502$ ($p=0.001$) [$R^2 = 0.193$, $F_{(8, 387)} = 9.502$, $P= 0.001$]							
Dependent variable: Glycated Hemoglobin				Source: Field data, 2017.			

4.7 Summary of findings

The study revealed majority of participants 78.8% being females. The mean age of participants was 59 years with majority falling within 60-69 years. Majority were married 60.5% and had average household size of 3.4 members. Majority of the participants (84.2%) were educated and gainfully employed (47%). Akans were the largest ethnic group representing 48.5% in the sample population with majority (91.8%) of participants living in the Greater Accra Region. About 72.8% of the participants have history of diabetes in their family and the average year that; participants were diagnosed of diabetes was 46.5 years. The average years participants have been living with diabetes was 12 years. Majority of the participants were overweight (38.3%), obese (34.5%) and had glycated hemoglobin level greater than seven (HbA1c value > 7) (54.5%).

The study further revealed that, participants had high knowledge of illness identity or symptoms of diabetic condition (Mean = 5.5, SD = 1.4), timeline (Mean = 15.8, SD = 29), understood the consequences (Mean = 22.1, SD = 3.3), high beliefs in personal control (Mean = 7.7 SD = 1.8), treatment control (Mean = 10.5, SD = 1.8) and illness coherence (Mean = 7.1, SD = 1.9). Participants revealed that the main causes of diabetes in ascending order was diet or eating habit (Mean = 4.35, SD = 0.96), hereditary (Mean = 3.98, SD = 1.38) and own behavior (Mean = 3.55, SD = 1.27). Additionally, the three most recalled symptoms of diabetes identified by participants were hyperglycemia (Mean = 0.99, SD = 0.90), changes in vision (Mean = 0.90, SD = 0.30) and hypoglycemia (Mean = 0.89, SD = 0.31). The most reported complications of diabetes from the study were neuropathy 63%, retinopathy 62% and hypertension 52%. Again, the study found that, behaviour disengagement (Mean = 2.59, SD = 0.68), denial (Mean = 2.22, SD = 1.06), planning (Mean = 2.15, SD = 0.91), positive thinking (Mean = 2.44, SD = 0.81),

acceptance of responsibility (Mean = 2.43, SD = 0.84) and religious coping (Mean = 2.49, SD = 0.84) were the most employed coping strategies or practices by the participants.

Furthermore, participants reported high self-care mean score for eating healthy diet (Mean = 5.19, SD = 1.65), seeking proper medical care (Mean = 3.36, SD = 1.07) and strict adherence to medication (Mean = 3.28, SD = 0.94) with high mean score indicating higher self-care participation. Junior high school and tertiary education were the demographic characteristics that significantly predicted self-care practices by 19.3% and 22.3% of the variance respectively. Similarly, identity, personal control, illness coherence, timeline and emotional representation or reaction were illness representation variables that significantly predicted self-care practices by 15%, 29%, 11.7%, 11.5% and 11.1% of variance respectively. Coping variables that were significant in predicting self-care practices were seeking social support, denial and venting accounting for 30.2%, 8.4% and 10.6% of variance. Illness representation and coping strategies jointly explained significantly 24% of variance in self-care behaviors of participants.

Finally, age, number of years living with diabetes and total self-care practices were found to statistically significantly predicted glycated hemoglobin level accounting for 19.5%, 13.2% and 35.5% of variance in glycated hemoglobin level respectively. Self-care practices and demographic characteristics together explained significantly the variance in glycated hemoglobin by 19.3%.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 Introduction

This chapter focuses on the discussion of the findings of the study. The objectives of this study and key findings are first presented followed by discussion of socio-demographic background of the participants then the rest of the chapter is divided into sections according to the objectives of the study.

5.1 Objectives of the study

The main objective of the study was to examine the role and effectiveness of self-care management among Type 2 diabetes patients at the Korle Bu Teaching Hospital (KBTH), Accra.

The specific objectives were to:

- i. Assess the illness perception or knowledge level of people living with type 2 diabetes about their disease condition and management.
- ii. Determine the coping strategies of type 2 diabetes patient in the management of their condition.
- iii. Explore the self-care management practices among type 2 diabetes patients?
- iv. Identify the factors that influence self-care practices among type 2 diabetes patients.
- v. Determine the effectiveness of current self-care practices among type 2 diabetes patients.
- vi. Assess patients' needs for education and the types of education required to increase DM self-management and raise self-management effectiveness.

5.2 Major findings of the study

From the study, descriptive results revealed that total mean score for illness perception 83.2 (SD = 8.9) and causes 54.19 (SD = 8.98) were high. Participants had high perception or knowledge in illness identity or symptoms of diabetes condition, timeline (chronic), consequences of DM, personal control, treatment control and illness coherence. The causes of DM in ascending order was diet or eating habit, hereditary, own behavior with chance/bad luck being the least. Also hyperglycemia, changes in vision and hypoglycemia were three most recalled symptoms of DM identified by participants in this study. Two hundred and ten (210) participants (52.5%) had diagnosed complications of DM with neuropathy, retinopathy and hypertension being the most reported ones.

The study found that, there was a relative adoption of coping strategies (total mean score 23.58, SD = 3.88) by participants with venting, denial, planning, positive thinking, acceptance of responsibility and religious coping being the most frequently used coping styles.

The total mean score for self-care practices (25.38, SD = 5.52) was moderate, an indication of moderate participation in self-care activities. Participants reported high participation in taking healthy diet, seeking proper medical care and strict adherence to medication with SMBG being the least self-care practice.

Demographic characteristics (Junior high school and tertiary education), illness perception (identity, personal control, illness coherence, timeline [chronic] and emotional representation) and Coping strategies (seeking social support, denial and venting) were significant and jointly explained 37.1% of variation in self-care practices.

The study revealed a weak correlation between self-care practices and glycated hemoglobin level. Only two (2) variables (Risk reduction behaviours or risk modification and total self-care) significantly correlated with HbA1c level with correlation coefficient of $r = 0.210$ and $r = -0.391$ respectively. Also results from the hierarchical multiple regression showed that; demographic characteristics and self-care practices together significantly explained 19.3% of the variation in glycated hemoglobin. Age, number of years living with diabetes and total self-care practices were found to be statistically significant and accounted for 19.5%, 13.2% and 35.5% of variation in glycated hemoglobin level respectively.

Now the next section looked at detailed discussion of major findings.



5.3 Objective 1 discussion of findings

Illness perception of people living with Type 2 Diabetes Mellitus

People with a chronic illness example diabetes mellitus obtain new information about their condition and evaluate their attempts to regulate, cure or cope with its effects, new pictures are formed and developed based upon these experiences. Illness perception or representations normally amass, as new information is embraced, rejected or modified as required.

This study found that participants had high total mean score of 83.2 (SD = 8.9) for illness perception and high mean score of 54.19 (SD = 8.98) for all subscales on causal beliefs. These high scores mean that participants have strong beliefs and high knowledge in the symptoms or changes in function, chronicity of the condition, unpredictable course, greater number of consequences, stronger personal and treatment control and overall greater understanding of the DM and its' management.

These findings might have been attributed to the number of years' participants have being living with DM coupled with their educational background. As the time of living with DM increases, participants tend to gain more understanding about the disease through interaction with health professionals, peers at the clinic, family and friends, social networks and their active involvement in the counselling sessions and health education programmes organized at the Diabetes Centre on all clinic days. Example Camero, Durazo and Rus (2017) stated that participants' high understanding of a threat (DM) can reduce emotional distress related to confusion and boost the individuals' motivation to participate in treatment plans. This might have been the cause of sub-average beliefs on emotional representation (mean score = 14.7, SD = 4.5). This result is

similar with the findings of Maharjan, Chinnawong and Kritpracha (2017), Clark (2008), Hart and Grindel (2010) but is in contrast to the findings of Searle, Wetherell, Campbell, Dayan, Weinman and Vedhara (2008).

Maharjan *et al.* (2017) examined the illness perception among Hypertensive patients in Nepal. They found that hypertensive patients perceived their condition as chronic, with serious consequences like heart attack, brain hemorrhage, paralysis of body and death. As a result, the patient's emotional characteristics were moderately impacted by hypertension. Medical control was highly emphasized than lifestyle modification among these participants. Patients also perceived unhealthy diet as the main cause of hypertension but stress and others like age, heredity, lack of sleep, obesity, getting angry frequently and fear of an earthquake were also mentioned. The similarities in findings may be attributed to the fact that both studies used cross sectional design, administered questionnaires, purposive sampling technique. Culture may also have attributed to the causalities, however there were cultural difference in that patients at Nepal perceived that their blood pressure level worsened because of consumption of salty, spicy foods and alcohol that was considered normal in their cultural and religious rituals whiles those in Ghana believed that they DM of the dependence on their staple foods which are full of carbohydrate.

This study revealed that the most reported agent of causation of DM were diet or eating habit, followed by hereditary then ones' own behavior and alcohol. Quite a number of participants perceived that, diabetes mellitus is caused by spiritual factors or evil eyes. This means that, some participants attributed the cause of DM to spiritual forces. This is reasonable because, religious beliefs are part of African societies. These findings on causal attribution is similar to the findings of DeGraft, Awuah, Pera, Mendez and Ogedegbe (2015). These

researchers examined the explanatory models of DM and DM related complications among urban poor Ghanaians living with DM. Their results revealed that participants related DM and its complications with diet, family history, lifestyle factors (smoking, excessive consumption of alcohol and lack of physical activity), psychological stress and supernatural factors (witchcraft and sorcery). They indicated that the relations were informed by the biomedical and cultural representations of DM. Additionally, DeGraft and colleagues (2015) noted that one important factor that caused reduced self-care practices and non-compliance to treatment regimen was poverty. The similarity in the findings may be due to the use of participants from the same black origin, the same setting Accra and people with the same cultural and religious beliefs.

However, the findings of this study contradicts the results of Searle, Wetherell, Campbell, Dayan, Weinman and Vedhara (2008) where a comparison of illness beliefs was made between patients with diabetic foot ulcers, patients with diabetic retinopathy and patients of the same age and gender but without such complications (control group). The researchers found that there were dissimilarities in the health beliefs of DM patients based on their diabetes related complications. Their study indicated that patients with foot ulcers had high illness belief in personal control of DM, but treatment control belief was lower than that of patients with retinopathy and patients of the same age and gender without serious complications (control group). DM patients with foot ulceration also had less understanding of DM and viewed the disease condition highly cyclical than patients with retinopathy and diabetic control. Searle and colleagues also noted that participants with foot ulcer had greater emotional beliefs than retinopathy and control group but this result was not significant.

These findings are relatively different from the current study. In the current study illness perception was not compared among patients with complication and those without complication so the high means scores recorded on illness beliefs could not be attributed to any specific group. Similarly, the current study recorded about eleven different complications as compared to the two discussed by Searle and colleagues. The differences in illness perception between these studies may be due to the difference in research setting, sample size and the number of complication. Current study was conducted in African setting, used a larger sample size of 400 participants and 11 diagnosed complications as compared to the study of Searle and colleagues that was done in a White European setting, smaller sample size of 66 participants and 2 complications.

5.4 Objective 2 discussion of findings

Coping strategies of participants in managing Type 2 Diabetes Mellitus

The Brief COPE, a 28- item self- report questionnaire (Carver, 1997) was used for this study. The current study indicated that, the total mean score on coping strategies was moderate 23.58 (SD = 3.88) indicating a relative adoption of coping strategies by participants. That is participants usually adopt some dimensions of coping strategies in managing their diabetes condition. The study revealed that coping dimensions like behaviour disengagement (attempt to give up on self-care behaviours), denial (refusal to believe the individual has diabetes), planning (plan for future review and self-care practices), positive thinking (always hoping there will be a cure one day), acceptance of responsibility (acceptance of reality that numerous complications may develop if I don't control DM) and religious coping recorded relatively high mean scores. This implies high participation or usage of these coping styles by participants.

This results is similar to some findings in literature (Dempster *et al.*, 2015; Namageyo-Funa *et al.*, 2015; Patel *et al.*, 2002; Samuel- Hodge *et al.*, 2000). Dempster *et al.* (2015) conducted meta-analysis of thirty one (31) articles on people's "illness perceptions and coping in physical health conditions". They found that dimensions of coping were highly accountable for changes in outcome than the dimensions of illness representations. Coping strategies like behaviour disengagement, venting of emotions and denial appeared to show the strongest relationship with outcome. The findings of both studies are similar but venting of emotions by participants in this current study was barely used as a coping strategy. The similarities may be related to the use of the same target group (people with physical illness) and illness perception questionnaire in both studies. However, this study employed more coping strategies as against what was reported in the study of Dempster and colleagues (2015). The difference may also be attributed to employment of different health outcomes. Current study measured self-care and HbA1c as outcomes while Dempster and colleagues (2015) focused on psychological health or emotional well-being or distress outcomes.

Namageyo-Funa, Muilenburg and Wilson (2015) also explored the role of Religion and Spirituality in Coping with Type 2 Diabetes among Black Men qualitatively. The researchers concluded that religion and spirituality were influential to participants' coping with health and indicated the various aspects of religious coping as used by the participants. The findings of the study revealed that nine out of the twelve (9 out of 12) participants described how their beliefs in prayer and in God has worked for them, six (6) participants had beliefs that God has kept them alive, six participants also said they have turned things over to God to handle for them the things they could not

handle, 5 participants believed God has helped them to change their unhealthy lifestyle and behaviors like drinking and smoking, 4 participants narrated how God supplied their needs, 4 participants spoke on how reading the Bible has helped them, and 2 participants reported how religious or spiritual individuals from their place of worship had helped and supported them.

The findings of Namageyo-Funa and colleagues (2015) are similar to the findings of this current research as participants used for this study recorded a high mean score of 2.49 (SD = 0.84) in a range of 0-3 on religious coping, an indication of high belief in God hence high adoption of this coping measure. The similarities in findings may be attributed to the use of participants from the same black origin though, Namageyo-Funa and colleagues (2015) engaged only males (12) in their study whilst this study used both males (85) and females (315).

Similarly, Patel, Shah, Peterson and Kimmel (2002) found that religious beliefs were found to be related to perception of depression, illness effects, social support, and independently of medical aspects of illness in patients with End Stage Renal Disease. The study indicated that 87% of participants were African-American. It also revealed that greater beliefs on spirituality and religiosity was associated with increased perception of social support, quality of life and less negative beliefs about illness effects and depression hence, asserted that religious beliefs may be used as coping mechanisms among patients with ESRD. Here the similarity between the current study and that of Patel *et al.* (2002) centers on the high usage of religious coping by study participants in response to illness effects though, participants have different physical conditions. The positive relationship between the findings of both studies could be attributed to the engagement of persons with similar health problem (chronic disease) and also participants for both studies seems to be from African origin.

Similarly, Korsah (2015) and Samuel- Hodge *et al.* (2000) also found that spirituality was an important factor in general health, disease adjustment, and coping among African- American women with type 2 DM and newly diagnosed type 2 diabetes in Ghana. Samuel Hodge and colleagues advocated that family-centered and church-based approaches should be integrated in DM management. This finding (religious similarity) could be attributed to the African origin. Though findings are similar but different research approaches were used. Samuel-Hodge *et al.* (2000) and Korsah (2015) employed the qualitative approach whereas this study used the quantitative approach.

5.5 Objective 3 discussion of findings

Self-care practices among Type 2 Diabetes Mellitus patients

Diabetes mellitus management is a life- long management plan and persons with diabetes have a crucial part to play in this plan (Evans & Pinzur, 2005). Diabetes self-care activities are behaviors or coping procedures undertaken by individuals with or are at risk of diabetes in order to successfully manage or control the disease on their own (Shrivastava *et al.*, 2013; AADE, 2008). Self- care activities and behavioral strategies help to promote lifestyle changes in clients' with diabetes mellitus (Funnell & Anderson, 2004).

Current study found that, total self-care activity score ranged from 13-44 with a mean score of 25.38 (SD = 5.52) which implies that participants moderately participated in self-care activities. Participants' participation in taking a healthy diet, adherence to prescribed medication (insulin and or oral hypoglycemic agent) and seeking proper medical care for diabetes and other health related problems were good. However, Self-

monitoring of blood glucose (SMBG), engaging in physical activity, foot care and risk reduction behaviours (avoidance of alcohol, high fatty and fizzy foods, smoking among others) were very low.

Considering the mean score for diet, it could be deduced that some participants had the challenge of keeping to healthy diet as stipulated by Franz and Evert (2012). In the study, several participants responded in the affirmative (indicated applies to me to some degree or sometimes) that occasionally they eat lots of sweets and other foods rich in carbohydrate. The finding of the study is similar to that of Ng and Jeffery (2003) who found that participants stress level psychological stress level people could alter their emotional state. The state of psychological imbalance might in-turn may induce comfort seeking behaviours like increased food intake and reduction in performance of physical activity. This similarity in finding may be attributed to similarity in age as the same age group were used for both studies.

However, findings of this current study are contrasting to some findings in literature (Bruce *et al.*, 2015; Johani, Kendall, & Snider, 2015; Asche *et al.*, 2011). Bruce *et al.* (2015) earlier conducted a research in Ghana and noted poor adherence to treatment regimens among patients attending Korle-Bu teaching hospital. This was attributed to patients' inadequate health literacy and lack of involvement in the treatment decision-making process, and those that are related to physicians and nurses' example; prescription of complex drug regimens, communication barriers, ineffective communication of information about adverse effects and other important information. The difference in the results of the current research and that of Bruce and colleagues may be attributed to high literacy level among current participants (84.2%).

In relation to seeking proper medical care, result of this study was good however contradicts the findings of Asche and colleagues (2011). These researchers conducted a broad review on DM treatment compliance and its' association with clinical and economic outcome. The researchers found that 57% of studies (13 out of 23) on glycemic control revealed that improved adherence was related to better glycemic control and reduction in accessing healthcare. Asche and colleagues (2011) further noted that the ability of the various studies to draw a difference between compliance and glycemic control tend to recur more often (7 out of 9, 78%) in studies that considered compliance in terms of treatment refills as compared to studies that used various constructs for participants' re-counted compliance. The differences may be due to the differences in setting. Additionally, in Saudi Arabia, some researchers studied the frequency of self-management activities among type 2 DM patients. The results indicated that 15% of participants had good glycaemic control (glycated haemoglobin ≤ 7 mmol/L) and the total mean score for self-care practices was 3.7. The researchers noted that most of the participants took their medication as prescribed, however many demonstrated low levels of compliance with other self-management practices. The researchers also found that males and participants with lower incomes participated low in self-care activities. The study revealed that participants were given basic advice on self-care practices and few others were given detailed information. Similarly, the results showed that participants' age, educational level and number of year living with DM had little impact on total self-management scores after all other characteristics were adjusted. They concluded that there were opportunities for improvement in self-management practices so as to enhance good glycemic control (Johani, Kendall, & Snider, 2015). However, the current study

found that 45.5% of participants had good glycemic control and the total mean score for self-care was 25.38 indicating moderate participation in self-care activities. Additionally, this study revealed that most of the participants adhered to self-care activities more especially in the areas of diet, taking prescribed medication and seeking of proper medical care. These findings are different and this variation might be caused by difference in sample size and the data collection tool. The current study used a sample size of 400 participants and the Diabetes Self-Management Questionnaire (DSMQ) to assess the extent to which participants engaged in self-care practices over the last 2 months whereas Johani *et al.* (2015), used 210 participants and the Arabic version of the Summary of Diabetes Self-care Activities (A-SDSCA) questionnaire to estimate the frequency of engaging in self-care.

Gowda and Ganjigatte (2012) also undertook a study to assess the knowledge and self-care practices among type 2 DM patients in Hassan using 200 diabetes patients. The researchers reported that the mean age of persons living with DM was 54.15(SD = 10.05) and the mean number of years living with DM was 6.63 (SD = 5.54) years. The researchers further reported that majority of the participants (n = 176, 88%) had average to good knowledge on self-care. Again, Gowda and Ganjigatte (2012) indicated that Knowledge on self-care management was significantly higher in participants who had lived with DM for longer period of time. Gowda and Ganjigatte's study also revealed that 48% of participants practiced foot care, 24% had practice of regular eye check-up and 23% of participants took precautions while travelling. The researchers noted that although knowledge regarding self-care in DM was high, the same was not practiced (Gowda and Ganjigatte, 2012). The findings of Gowda and Ganjigatte is dissimilar to the findings of the current study which revealed that the mean age of participants was 59.0 (SD = 9.7) and the mean duration of DM was 12.0 (SD = 7.4). Knowledge on DM significantly

predicted self-care by 24.4% and the most practiced self-activities were taking healthy diet, strict adherence to medication and seeking proper medical care. The variation in findings could be attributed to cultural differences and individuals' perceptual health beliefs.

5.5 Objective 4 discussion of findings

Factors influencing self-care among type 2 diabetes mellitus patients

Self-care practices are necessary activities required of diabetes patients in order to significantly minimize or delay the onset of long term complications (Shrivastava *et al.*, 2013; Stratton *et al.*, 2000). There are several factors that serve as barriers to self-care including lack of self-control related to food and dietary choices, confusion and forgetfulness and inconvenience of diabetes self-care (Byers *et al.*, 2016). This partly explains why some participants have moderate levels of self-care participation.

The current study revealed that self-care activities among participants was moderate with a total mean score of 25.38 (SD = 5.52). The hierarchical multiple regression results shows that, the overall model significantly predicted the dependent variable, self-care behaviour. The model accounted for 37% of variance in the self-care practices. This means that 37% of change in participants' self-care practice was explained by demographic characteristics, illness perception and coping strategies.

The current study found that participants' demographic characteristics (JHS and Tertiary levels) of education significantly contributed to the model. As the individuals' education level increases, participation in self-care practices also increases. Though factors like sex, household size and employment status or gainful employment negatively

predicted self-care practices, they were not significant. This means males, increase in family size and high economic status due to gainful employment would lead to reduced participation in self-care practices.

Furthermore, the current study found that Illness perception (all dimensions of illness perception inclusive) explained the changes in self-care practices by 24.4%. Identity, personal control, illness coherence, timeline and emotional representation were significant to the model. However identity was the only negative predictor among these five (5) dimensions. This implies that; participants' participation in self-care practices are reduced when they have strong beliefs in symptoms (identity). However stronger beliefs in personal control, illness coherence, timeline (chronic) and emotional representation yields positive (increased) participation in self-care practices.

Results of the current study also showed that seeking social support, denial and venting of emotions were the dimensions of coping strategies that statistically and significantly predicted variation in self-care practices. Increased engagement of services from friends, peers, healthcare providers and social networks were associated with high self-care practices. High expressions of negative feeling tends to improve the individuals' performance of self-care activities. High usage of denial as coping leads to reduced participation in self-care practices. Hence, social support and venting are positively associated with self-care practices whereas denial is negatively associated with self-care practices. The results of this study is consistent with the findings of Hart and Grindal (2010) and Abubakari and his colleagues (2011).

Hart and Grindel (2010) investigated into Illness perception, emotional distress, coping activities and efficacy as predictors of patient outcomes among people with type 2 DM. The researchers found that dimensions of illness perception collectively explained 27% of variance in

self-care activities of patients however, none of the illness representation constructs individually contributed significantly to self-care activities. Findings of Hart and Grindel (2010) revealed that participants had beliefs that their diabetes was chronic, moderately cyclical with negative consequences and moderate amounts of symptoms that greatly influenced the individuals' emotional status. The researchers noted that coping efficacy distinctively accounted for 9% of the change in self-care behaviour and illness perceptions, particularly timeline-cyclical, uniquely accounted for 12% of the variance in HbA1c levels. Additionally, Hart and Grindel (2010) found that only age as a demographic characteristic contributed to self-care practices. In the current study, five (5) dimensions on illness representation statistically explained 24% of variance in the self-care activities of patients with identity, personal control, illness coherence, timeline and emotional representation contributing to 15%, 29%, 11.7%, 11.5% and 11.1% respectively to the predictive power of the regression model.

The similarity in findings might have been caused by the use of similar data collection tool, research approach and design and statistical analysis as both studies used Revise Illness perception questionnaire, quantitative research approach, cross sectional research design and hierarchical multiple regression for analysis. The differences may be attributed to differences in research setting and data collection tool as current study used an African setting and while Hart and Grindel used an European setting and also current study used Diabetes Self-Management Activities Questionnaire (DSMQ) for assessing self-care activities whereas Hart and Grindel used Summary of Diabetes Self-care Activities (SDSCA) questionnaire to elicit response on self-care activities.

Similarly, Abubakari and his colleagues (2011) used 359 participants in examining the effects and relationships between perceptions, self-management and metabolic control outcomes among type 2 diabetes patients of European and African origin in London. The researchers found that diabetes clients from both African and European origin perceived diabetes with dire consequences to be closely related to poor self-management. From their study; the relationship between beliefs on personal control and self-management was however stronger among participants of African origin. The researchers used a multivariate analysis which indicated that illness perceptions was responsible for significant changes in self-management behaviors of participants of both origins with personal control been the main factor that influenced the variations in self-management however the variations in self-management among African-origin patients were also attributed to other constructs of illness perception like consequences and emotional representations. Self-management could not, however, predict any metabolic control outcome for the participants in any of the ethnic group when demographic and disease characteristics were held constant or controlled.

The similarities in findings might have been attributed to similarities in setting and the sample size. Current study used participants of African origin and sample size of 400 participants. Abubakari and colleagues (2011) also used participants of both African and European origin and sample size of 359 participants. The difference might be attributed to the mode of analysis. Whereas, current study used hierarchical multiple regression, Abubakari and colleagues (2011) used both correlations and multiple regression techniques.

With respect to the use of social support as coping, the findings of this research work agree with literature (Kadirvelu *et al.*, 2012; Orr Chlebowy *et al.*, 2010; Tang *et al.*, 2008; Ingram *et al.*, 2007; Byers *et al.*, 2016) that identified friends, family and peers as a major

facilitator of self-care. Kadirvelu, Sadasivan and Ng Shu (2012) carried out a review that examined the various dimensions of social support, their influence on diabetes self-care, and how health care providers could help in the process. These researchers delved into the role that social support play, the importance of care from family, friends, peers and health care providers, the effect of sex and cultural factors on self-care behavior and the role that literacy play in diabetes self-care.

Kadirvelu and colleagues (2012) found that; Family and friends assist clients in self-management practices like checking of blood glucose, giving of insulin injection, planning and preparing of diabetes meal, supervision of physical activity and foot care because, behavioral modifications may be difficult when enforced by one individual person. Their study also indicated that assistance in daily activities and emotional upkeep from family relations and associates may have a positive effect on diabetes self-care behavior in general. Example of this was the study of Orr-Chlebowy, Hood and LaJoie (2010) in which the researchers reported that there was a positive relationship between relatives and friends support and diet, exercise, compliance with medication, checking of sugar level and foot care was found.

Kadirvelu *et al.* (2012) also found that peers had much to offer one another as they give non-judgmental assistance to each other but there was no evidence of the effectiveness of peer support in DM management especially in developing countries. They indicated that women show improved self-care behaviour, less expected to get married and more likely to share personal concerns with friends (Spitze & Ward, 2000). Additionally, in Kadirvelu and colleagues' review, there was evidence that people with diabetes had limited health literacy (Cavanaugh *et al.*, 2008). Low diabetes knowledge

results to low self-care behaviour (Tang *et al.*, 2008; Bass *et al.*, 2002) because patients poorly understood physicians' instructions and health education given by the nurses which in-turn lead to worse glucose control and increased healthcare cost. Kadirvelu *et al.*'s findings in 2012 also indicated that patients had beliefs in God as a source of their strength and important resource for DM management.

Kadirvelu and colleagues (2012) further found that; several researchers had revealed that support from healthcare practitioners was essential to peoples' awareness on how to self-manage DM. Example, a survey by Tang, Brown, Funnell and Anderson (2008) revealed that, more than 40% of participants acknowledged the physician giving them the greatest social support in the management of their DM condition.

The current study also found that social support from family, friends, peers and healthcare providers predicted 30.2% of change in self-care practices. The similarities between Kadirvelu and colleagues (2012) review and current study might be due to the likeness of the target population (use of male and female type 2 diabetes patients). Nevertheless, participants employed in this current study were health literates as compared to participants described in Kadirvelu *et al.*'s work. In the current study, majority of participants (n = 337, 84.2%) had some form of education and their educational level (JHS and Tertiary) explained 19.3% and 22.3% of change in self-care practices from the regression analysis.

Similarly, with reference to social support the findings of current research, Kadirvelu *et al.* (2012) and that of Byers *et al.* (2016) are similar. In 2016; Byers, Garth, Manley and Chlebowy conducted a study on African American using focus group discussion to examine the facilitators and barriers of self-management among type 2 diabetes patients. From their study, respondents identified family support such as friends and family members as an important

facilitator to self-management of their DM. They identified various forms by which the family renders support example reminding patients to take medication, assistance with meal preparation, encouraging them to make healthy choices such as participating in physical activity, and monitoring their diet. Participants in Byer et al.'s study mentioned that support from social groups and health care providers facilitate diabetes management hence they suggested the need for support groups to assist organizing physical activities to help them in exercising their bodies.

Byers *et al.* (2016) identified lack of self-control related to food and dietary choices, forgetting, confusion and inconvenience of diabetes self-management as barriers to self-management. Fear was another important barrier identified to self-management as some participants recounted that, they fear needles, fear of being on insulin, and fear of the complication of the diabetes such as blindness. However, the participants did not think that, the fear of complications of the disease was enough to motivate them to adhere to therapeutic regimen. Self-perception of the participants' health was also considered as a strong barrier. Some participants revealed that, their personal assessment of the systems by instincts is enough to determine whether they have to or not to take their medication for a particular day. Again, participants perceived that weight loss was bad and equated with poor health and being unwell. Byer *et al.* (2016) also found that religion and belief in God was vital to help with type 2 DM management as some participants stated that they were not going to worry about having diabetes and God would take care of them. Many participants felt that diabetes was well managed if their blood glucose was under 200 mg/dL or 11.1 mmol. The results of the current study and that of Byers and colleagues (2016) on social support are similar and this might be caused by the use of the

African origin and participants with the same disease condition (type 2 DM) in both studies however finding from Byers *et al*'s was in-depth than the current study. The differences may be attributed to the research approach used by the individual studies. Byers and colleagues employed qualitative approach and focus group discussion in data collection whereas current study employed quantitative approach and survey in data collection.

However, the results of this study is dissimilar to the findings of Dinesh, Kulkarni and Gangadhar (2016), Dempster *et al.* (2015) and Mc Sharry, Moss-Morris and Kendrick (2010). In 2016, Dinesh and colleagues conducted a study to assess the Knowledge level and self-care practices among Type 2 DM patients in Sullia, Karnataka. Dinesh and colleagues (2016) found that most of the participants were married males of Hindu religion and belonged to upper middle class. The researchers indicated that about quarter of participants (97, 24.25%) had good knowledge but compliance to some dimensions of self-care practices was poor with foot care being the most neglected self-care activity. The current study also found that most of the participants were married females, Christians and not in gainful employment. About two thirds of participants had good knowledge on DM and total mean score for self-care practices was 25.38 out of 13-44 observed range and the most neglected self-care activity was SMBG. The results of these two studies differ and this disparity may be due to differences in gender, cultural and setting as Dinesh and Colleagues (2016) had more male participants of Hindu religion compared to more females participants of Christian religion in the current study though the same sample size and similar target group of 400 type 2 DM patients were used in both studies.

Additionally, in 2011, Mc Sharry and colleagues conducted a systematic review and meta-analysis on 13 articles to assess illness perceptions and glycemic control in DM. They found that there was a positive relationship between stronger beliefs in identity, consequences,

timeline cyclical, concern, and emotional representations and HbA1c however greater personal control was negatively related with HbA1c. However, in the current study, there was a negative association between stronger identity beliefs and self-care whereas greater personal control was positively associated with self-care. The difference may be attributed to variation in the type of design, source of data and mode of analysis used. Mc Sharry *et al.*'s meta-analysis was made up of 9 cross sectional studies and 4 Randomized controlled trials with data collection from a secondary source and data analysed with Pearson correlation whiles this current study employed only cross sectional design with data collection from primary source and data analysed with hierarchical multiple regression. Again, Mc Sharry and colleagues (2011) used studies that had used any of the 3 forms of the Illness perception questionnaire example: Illness Perception Questionnaire, the Revised Illness Perception Questionnaire and the Brief Illness Perception Questionnaire whilst this study only used the Revised Illness Perception Questionnaire however both studies were done on adults with DM. Finally the outcome (dependent variable) that was measured here in this current study was self-care whereas Mc Sharry and colleagues' work outcome measured was HbA1c.

5.6 Objective 5 discussion of findings

Effectiveness of self-care practices in the management of Type 2 Diabetes Mellitus

The ultimate aim of self-care activities are aimed at good glycemic control, reducing complications and improving diabetes care and quality of life (Shrivastava *et al.*, 2013; Walker 1999). The current study found that, the mean glycated hemoglobin level is 7.9% indicating that, the blood glucose levels were not in good control or the

participants' glycemic control were poor as reported in the National Institute and Clinical Guideline (ADA, 2015; NICE, 2008).

The current study found a weak but significant negative correlation ($r = -0.391$) between total self-care and glycemic levels. This means that, a unit increase in total self-care activity of patients culminated in a corresponding decrease in glycemic levels by 39.1% and vice versa. Implying that higher participation in self-care activities would yield good glycemic control (low glycemic level) but low participation in self-care would result to poor glycemic control (high glycemic level).

Hierarchical multiple regression results indicate that socio-demographic characteristics of participants (age and number of years with diabetes) jointly explained 3.4% of glycemic level of patients. The results indicated that age and years living with diabetes has a negative and positive significant effect of 19.5% and 13.2% respectively on glycated hemoglobin level. This implies that older patients exhibited poor glycemic control (higher levels of glycated hemoglobin) than their younger counterparts. This finding on age supports the findings of Compean- Otiz, Gallegos, Gonzalez, Gomez-Meza, Therrien and Salazar (2010). The study of Compean-Otiz and colleagues indicated that older adults (above 46 years) tend to forget verbal and visual activities after sometime of exposure as compared to their younger counterparts (between 35 and 45 years). These researchers found that younger people exhibit better immediate and delayed general memory learning than older people. The findings of the current study and that of Compean-Otiz *et al.* (2010) are similar and might be due to the similar age range of the participants used in both studies.

Similarly, self-care practices (seeking proper medical care, performing exercise, risk reduction behaviours, foot care, healthy diet, self-monitoring of blood glucose, strict adherence

to medication and total self-care) jointly explained significantly 19.3% of the variance in glycated hemoglobin levels of participants. However, only total self-care had a unique significance in the model by accounting for 35.5% of variance in glycated hemoglobin level of participants. That is participants who are better in taking good care of themselves with respect to self-care practices significantly have reduced glycated hemoglobin levels. This finding is consistent with literature (D'Souza, Karkada, Parahoo, Venkatesaperumal, Achora & Cayaban, 2017; Kav, Yilmaz, Bulut, & Dogan, 2015; Shayeghian *et al.*, 2015; Hart and Grindel, 2010) who also found significant negative correlation ($r = -0.63$, $p < .01$) and ($r = -0.291$) between self-care behavior and glycemic levels.

D'Souza and colleagues (2017) conducted a study to examine the relationship between glycemic control, demographic and clinical factors on self-efficacy and self-care behaviours among adults with T2DM in Omani. The researchers found that there was no significant change on the level of self-care behaviours, demographic and clinical features. The results indicated that majority of the participants had a fasting blood glucose >7.2 mmol/L (90.7%), and most of them indicating uncontrolled or poor HbA1c of $> 8\%$ (65%). Change in self-care behaviour (20.6%) and 31.3% of the change in self-efficacy was explained by the age, duration of diabetes, medication, HbA1c and prevention of activities of living jointly explained 20.6% variation in self-care behaviour and 31.3 % of change in Self-efficacy. The researchers stated that adult persons with Type 2 DM with poor glucose control were more likely to have poor self-efficacy and self-care behaviours. D'Souza and colleagues (2017) also noted that glycemic control has an effect on improving diet, exercise, foot care efficacy medication and behaviours.

In 2015, Kav and colleagues also investigated self-efficacy, depression and self-care activities among persons with type 2 DM in Turkey using 200 participants. The researchers found that 37.5% of participants had depression symptoms. They noted that women with low educational background who had diabetes complications and difficulty in paying for hospital bills recorded high scores on the depression inventory. The mean self-efficacy score was 66.5 (SD = 14.0), participants who lived alone, were unemployed and knew their HbA1c level had significantly higher mean score of 66.5 (SD=14.0). Kav and colleagues study in 2015 also revealed that participants' demographic and diabetes features including age, education, social support, HbA1c level, complications and having diabetes education were significantly related with all self-care practices except smoking (Kav *et al.*, 2015). Current study also found that number of years living with DM and social support significantly predicted self-care practices except smoking as no participant responded positively to smoking. Again, in the current study, number of years living with DM, age and total self-care were significantly related to glycemic (HbA1c) levels. The similarities in findings may be due to the engagement of similar target population (people with type 2 DM) in both studies.

However, the results of this current work contradicts the findings of Abubakari *et al.* (2011) and Compeán Ortiz *et al.* (2016) who did not find any significant correlation between self-management and glycemic levels among white-British and black African population. Compeán Ortiz *et al.* (2016) also reported that all the participants (100%) had poor glycemic control however the variables for self-care example; adherence to medication and exercise were significantly correlated to glycemic level among Mexican adults with Type 2 DM. The differences in findings might be attributed to the difference in setting and analytical techniques. Current study used hierarchical multiple regression, Abubakari and colleagues (2011) employed

both correlations and multiple regression techniques and Compeán Ortiz and colleagues (2016) used correlations.

5.7 Summary

In summary, this chapter focused on the discussion of findings and was arranged according to the objectives of the study. Participants had high perception in all dimensions of illness perception except emotional representation.

Participants employed planning, positive thinking, acceptance of responsibility, religious coping, behaviour disengagement and denial as coping styles more often as they attempt to manage their disease condition. Self-care practices among participants were relative high in relation to taking healthy diet, seeking medical care and adherence to medication.

Factors like demographical characteristics (JHS and Tertiary education), illness perception (identity, personal control, illness coherence, chronic duration and emotional representation) and coping strategies (social support, venting of emotions and denial) influenced self-care practices. Self-care practice is negatively associated with HbA1c hence as participants actively participate in self-care activities, their blood glucose levels drop and are controlled.

Again, this chapter discussed the major findings of the study and its' relationship with the existing literature. From the discussion, it was noted that some findings of this study were similar to the findings of other studies, however some findings also were in contrast to literature findings. Leventhal's Common sense model of self-regulation of health and illness has been a good fit for this study. Participant' illness beliefs influenced their coping styles which in-turn influenced their self-care activities and HbA1c levels.

The next chapter contains the summary of the study, implication for nursing, limitation, conclusion and some recommendations for policy makers, diabetes nurse educators and diabetes patients.



CHAPTER SIX

SUMMARY, IMPLICATION FOR NURSING, LIMITATION, CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This is the final chapter of the thesis. It includes a summary of the introduction, the methodology, key findings, limitations and the conclusions from the key findings as well as the recommendations emanating from the study.

6.1 Summary

Diabetes Mellitus (DM) is a chronic progressive metabolic disorder characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both (Diabetes, Atlas, 2006, p.17; WHO, 1999). According to the American Diabetes Association (2015), there are four categories of diabetes mellitus: Gestational diabetes, Other types of diabetes based on other causes, Type 1 diabetes mellitus, and Type 2 diabetes mellitus. This research focuses on type 2 diabetes with prevalence rate of 4.9% among the adult group (20- 79 years) in Africa (Peer *et al.*, 2014) and 3.35% in Ghana (IDF, 2013). Similarly, 266,200 cases of diabetes were recorded in 2015 in the country compared to 39,789 in 2005 and 156,076 in 2010 with prevalence of adult diabetes from 6% to 9% (MOH, 2012 report, pp. 13- 14). Though the disease has assumed a topical and an important area in recent times primarily as a result of the large and increasing number of people suffering from the disease (WHO, 2016) there is paucity of empirical evidence on self-care management practices that would enhance the wellbeing of persons living with DM and ultimately prolong their lives. The study therefore seeks to develop a better

understanding of the role and effectiveness of self-care management among Type 2 diabetes patients at the Korle-Bu Teaching Hospital (KBTH).

The study used a cross-sectional hospital based design and survey to collect data from a sample of 400 diabetes patients at KBTH. A structured questionnaire divided into four sections covering socio-demographic data, Illness perception, coping strategy and diabetes self-care management were used. The data was analyzed using the Statistical Package for Social Sciences (SPSS). The Leventhal's Common Sense Model of Self - Regulation of Health and Illness was used to assess the illness perception of people living with type 2 diabetes on their disease condition and its' management, the Hierarchical multiple regression was employed to determine if illness representation and coping strategies of patients have any significance in predicting their self-care behaviors.

Results from the raw demographic characteristics show that majority of the participants were females, 78.8% and had a mean age of 59 years. It was also found that 60.5% were married with mean household size of 3.4 members. Level of education was equally high, 84.2% had at least some level of formal education. Whilst only about half of the participants engaged in active employment (47%) and had their HbA1c greater than 7%, 54.5% of the participants were deemed as being overweight and obese. It was not, however, surprising that almost all participants (97.8%) were on the NHIS due the extensive nature of the later in the country.

On medical history and health characteristics of participants, 72.8% have history of diabetes in their family, were diagnosed at mean age of 46.5 years with the disease and were found to be living with the disease for 12 years on the average. Whilst the mean fasting blood sugar of participants was 8.2; that for glycated hemoglobin was found to be 7.9% with 54.5% of

them having their glycated hemoglobin level greater than 7%. The mean body mass index (BMI) was 28.7 indicating poor weight control by most of the participants.

In adapting the Leventhal's Common Sense Model of Self - Regulation of Health and Illness to assess the illness perception of people living with type 2 diabetes on their disease condition and its' management, the mean score for identity was found to be 5.5 and that for timeline 15.8 indicating high perception or high knowledge level on the symptoms of diabetes mellitus and participants seeing their illness as somewhat cyclical in nature respectively. With respect to consequences, participants perceived diabetes illness to have severe negative consequences on their psychological, physical, economic and social wellbeing but had positive beliefs about their personal and medical or treatment controllability or curability of diabetes illness. Participants also reported high level of understanding about their disease condition and identified diet or eating habit as the most commonly causal agent of the disease. This was followed by hereditary, own behavior and alcohol intake. Chance or bad luck was perceived to be the least cause of diabetes mellitus condition. With respect to coping strategies of participants in managing the disease which is also part of the Leventhal's common sense model adapted in this study, participants recorded relatively high mean scores in behavior disengagement (attempt to give up on self-care behaviors), denial (refusal to believe the individual has diabetes), positive thinking/ positive re-appraisal (always hoping there will be a cure one day), Acceptance of responsibility (Acceptance of reality that numerous complications may develop if I don't control DM) and religious coping. Very few patients were found to be dependent on alcohol as a coping style/tool in their management of DM.

Although, participants self-monitoring of blood glucose, performing exercise, foot care and risk reduction behaviors were all low in managing DM, the mean scores for healthy diet, seeking proper medical care, and adherence to medication or medical treatment were moderate indicating that participants eating habit, looking for proper medical care for diabetes and other related problems and taking of medications as prescribed were good.

The hierarchical multiple regression results show that, the model accounted for 37% of variance in the dependent variable, self-care behavior, thus on the whole, the model significantly predicted the dependent variable. It further shows that education (JHS and Tertiary education) and employment jointly explained 6.9% of the variation in self-care scores of patients. Whilst, personal control, illness coherence, timeline and emotional representation which are variables captured under illness representation, positively and significantly influenced self-care, Identity had a negative and significant effect on self-care behavior. Illness representation jointly explained 24.4% of variation in self-care behavior. With respect to coping strategies only two variables, social support and expression of negative feelings had positive and significant effect on self-care whilst denial was negative and significant.

The Pearson correlation and hierarchical multiple regression model were employed to determine the effectiveness of self-care practices. This was meant to establish whether self-care practices (independent variable) among participants have any significant effect on their glycated hemoglobin level. Results from the correlation analysis showed that, there was generally a weak correlation between self-care practices and glycated hemoglobin levels. Risk modification and total self-care were significant and positively and negatively correlated respectively with glycated hemoglobin levels. Thus changes in lifestyle were associated with higher glycated hemoglobin levels. Self-monitoring of blood glucose levels, healthy diet, seeking proper medical

care, performing exercise and foot care were not significant but negatively correlated with glycated hemoglobin levels while strict adherence to medication positively correlated with glycated hemoglobin levels.

The hierarchical multiple regression results showed that the model statistically significantly predicted the dependent variable. Both age and years with diabetes have a significant effect on glycated hemoglobin level. All the self-care practices jointly explained significantly some level of the variance in glycated hemoglobin levels of the participants. However, only total self-care had a unique significance in the model by accounting for a greater portion of variance in glycated hemoglobin level of the participants. Thus patients who are better in taking good care of themselves with respect to self-care practices significantly have reduced glycated hemoglobin levels.

6.2 Implications of the study

The findings of this study have implications for the nursing profession and the health care system in the country. The implications are grouped into nursing practice, nursing education and research and policy making.

6.2.1 Nursing practice and health care

The study found that knowledge regarding DM and its management is relatively high among DM patients who employed a number of coping strategies and self-care activities. While knowledge level was high, self-care practices also relatively high, usage of coping strategies was moderate. The individual self-care activities, however, could not predict significant changes in HbA1c as participants reported high values of glycemic level (both HbA1c > 7% and FBG > 7mmol/L). While age, number of years one lives with the disease and total

self-care predicted 19.3% of variation in HbA1c, total self-care contributed 35.5% to the predictive power of the model. For instance knowledge and perception exceeded the average in the various dimensions which had some level of impact on the patients' way of coping with DM as they adopted few coping skills of which only three predicted significant changes in their self-care behavior. Social support was significant and accountable for 30.2 % of change in self-care.

These findings suggest that people with diabetes have high knowledge in DM and its management however the same may not be practiced since most of them (54.5%) had poor glycemic control ($\text{HbA1c} > 7\%$) and 210 patients had diagnosed complications (52.5%). This suggest that some diabetes clients require high practical skills and the technical know-how to implement and turn their perceptual or theoretical knowledge into more realistic and practical work so as to enhance behavioural change. Nurses therefore, need to integrate health education with practical sessions like checking of once glucose level, calculating and administration of insulin, exact food proportions to take and the kind of exercise for specific groups. Instructional methods like demonstrations and return demonstration could be employed during education and training sessions.

The study also found that patients attributed the cause of DM to many factors with spirituality and evil eye inclusive. This view point may put patients in denial state as they tend to seek more spiritual help other than being active in the management of their condition. Hence nurses should focus more on individual assessments and make precise and accurate recommendations for self-care activities. Adjustments in activities should be specific for individual patients and only varied based on the response of the patient. Misconceptions on food proportioning should also be clarified, churches and social media could be involved in creating diabetes self-care awareness.

Family members should be involved in patients care. A system of collective care needs to be set up where DM patients have some of freedom and inspiration to perform optimal self-care activities. Nurses, midwives and diabetes nurse educators should implement co-management care with goals developed through interaction and agreement between patients and all significant social support group. Stakeholders of this group must ensure that there is extensive follow up visits by nurses to patients' homes (home visits) and patients to the health facility (check-ups/review), interactive participation of patients and regular support throughout the follow up to enhance vigorous self-care participation.

When patients are practically inclined, misconceptions clarified and with adequate support of significant others, patients' moral may be boosted and they may in-turn put in measures to bring down their glucose levels. With controlled levels of blood glucose, chances of hospitalization would reduce, workload on healthcare providers would go down, pressure on the healthcare institutions would reduce which would in-turn lead to a reduction of burden on the nation in-terms of expenditure on healthcare and medical cost.

6.2.2. For nursing education

Whilst the study found that though there was high perceptual knowledge there was a gap in the practical aspect (skill acquisition) of self-care. This suggests that nurses and midwives should be first of all practically equipped in order to impart such recommended skill to patients. Health training institutions should therefore ensure that their products (trained nurses and midwives) are holistically trained and are in good standing of rendering total care. Health tutors should engage student nurses and midwives in intensive practical sessions on disease management especially DM.

6.2.3. For nursing research

Further studies can be done to explore the role of self-care management by a qualitative approach.

6.2.4. For Policy makers

The study has significant implication for policy making in the area of production, importation and marketing of fizzy foods that have taken over the Ghanaian market. Thus the free liberalization of the Ghanaian economy to junk foods must be reviewed. Secondly, the existing policies on NCDs like diabetes must be vigorously enforced. For instance, taxes on production, importation and marketing of fizzy foods should be imposed. The study revealed that diet was the main cause of DM and the least self-care activity performed was SMBG due to the fact that participants could not afford cost of the device (glucometer). Ministry of health could subsidize the cost or include it under NHIS so that DM patients may be given on review or on discharge. Ministry of Health should also supply the District hospitals with the device for checking HbA1c so that there will be equity in diabetes care nationwide.

6.3 Limitations of the study

Quantitative research enhances generalization of results when data is drawn from fairly large random samples. However, the current study was limited to only Type 2 diabetes patients who have checked their glycated hemoglobin level within the last 12 months and attended diabetic clinic at the KBTH. Representation and generalization of the study could have been maximized if clients in other teaching hospitals were included in the study. The researcher restricted the study population because of limited time and financial constraints. Again convenience sampling was used to select participants for the study hence limiting the generalizability of the findings to other populations. However this sampling bias created from the

use of convenience sampling might have been reduced by the high response rate (100%) of participants. About 80% of the questionnaires were administered face to face or participants were interviewed as per their preference hence there was high risk for interviewer bias more especially when 4 different people (researcher and 3 research assistants) administered the questionnaire. In an attempt to minimize this interviewer bias, the 3 research assistants were trained on how to administer the questionnaire so that the questions could be read without any influence. Data on illness perception, coping and self-care were patients' own report and this could have been influenced by social desirability bias.

6.4 Conclusion

The study examined the role of self-care management among Type 2 DM patients at the KBTH, Accra using a cross-sectional data of 400 participants. The illness beliefs or knowledge level, coping strategies and the self-care management practices adopted by the participants were explored. The study also identified the factors that influence self-care practices, determine the effectiveness and as well as assess patients' needs and types of education required to increase DM self-management.

Participants in the current study have high illness beliefs and knowledge on DM and its' management. Participants demonstrated a broad understanding of diabetes in relation to the symptoms, causation, duration, consequences, personal and treatment control. There was a moderate adoption of coping strategies by participants in their attempt to manage DM with behaviour disengagement, religious coping, positive thinking, acceptance of responsibility and planning as the most frequently used coping styles. The researcher noted that people with DM moderately participated in some self-

care activities like taking of healthy diet, seeking proper medical care and strict intake of prescribed medication as participants were optimistic in controlling the glycemic levels.

The researcher further noted that demographic characteristics, illness beliefs, and coping strategies influence peoples' self-care behaviours. That is the individuals' level of education, personal control, illness coherence, timeline, emotional representations, seeking social support and negative feelings or venting of emotion facilitate peoples' participation in self-care activities whereas identity and denial serve as barriers to self-care practices. Again, results to determine the effectiveness of self-care practices among type 2 diabetes patients revealed that higher participation in self-care activities was associated with lower HbA1c levels. Whiles number of years living with diabetes and total self-care facilitate the control of glycemic levels, age was a barrier to glycemic control.

In effect, self-care is effective in controlling glycemic levels (HbA1c) in people with DM as it accounted for 35.5% of change in the study. Hence self-care practices play a vital role in the management of Type 2 DM.

6.5 Recommendations

Some key lessons have emerged from this study for Ministry of Health or government and its agencies, KBTH, nurses, DM patients and other stakeholders in the Ghanaian health sector.

Government or Ministry of Health

- First of all, the monitoring of glycemic levels by participants was low due lack of the glucometer by patients which they indicated was expensive. Besides, Ghana being a middle lower- income country, the lower socioeconomic status of some diabetes patients

has made it difficult for patients to acquire these gadgets and self-monitor their glycemic levels. It is therefore, imperative for government to take a holistic view of diabetic treatment and greatly subsidize cost of glucometers. Alternatively, cost of these instruments could be factored into NHIS and distributed freely to diabetes patients.

- The country can currently boast of only few diabetic nurse educators and it would be appropriate the nation recruits and train more people in this field to facilitate monitoring of people with DM.
- Food and Drugs Board regulate existing policies on glucose or sugar content in foods and beverages before production, importation and marketing. This should be done not to the detriment of the citizenry.

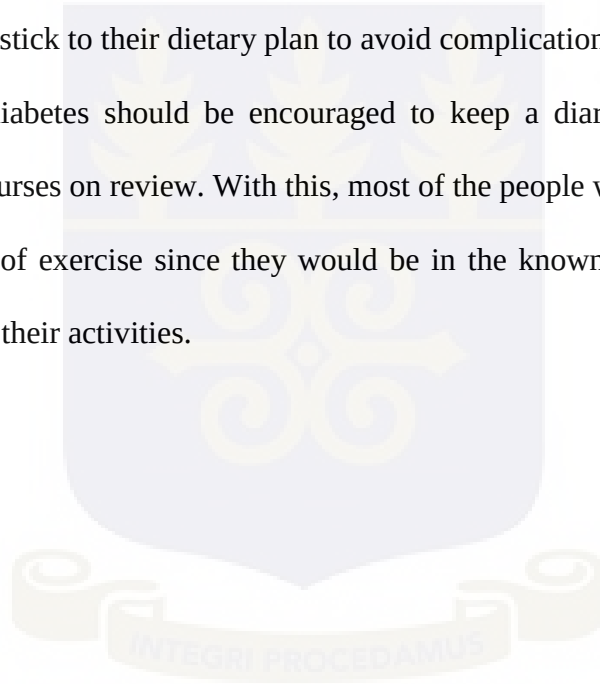
Diabetes Nurse Educators

- Results from the study showed that risk reduction factors (smoking, alcohol intake, foot care, weight control etc.) and engaging in healthy exercise were low among the participants although they have adequate knowledge about the consequences of these on DM. It is then suggested that diabetes nurse educators go on home visit to see what actually goes on at the individual settings. Family members, friends and peers of DM patients should be involved in the diabetic management process. Close relatives can assist and monitor self-care activities of patients at home. This would enhance the social support base of people with diabetes as well.
- During health education and counselling sessions, nurses should encourage family members to supervise physical activities of patients so as to yield good glycemic control. Again, partners, family members and friends should be encouraged by nurses to exercise with DM patients in order to promote regular physical activity.

- Success stories of those who have monitored their glycemic levels and took appropriate remedial measures be shared with colleagues on diabetes clinic days.

Diabetes Mellitus patients

- People with DM should be encouraged to form or join “keep fit clubs” that would help them go for frequent exercises to control their glucose levels hence weight.
- The most commonly identified agent of causation of diabetes was diet or eating habit with a mean score of 4.35 (SD = 0.96). It is recommended that DM patients be encouraged to stick to their dietary plan to avoid complications.
- People with diabetes should be encouraged to keep a diary on their exercises, to be inspected by nurses on review. With this, most of the people with DM will try and engage in some form of exercise since they would be in the known that there is some form of supervision of their activities.



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APPENDIX A: ETHICAL CLEARANCE

NOGUCHI MEMORIAL INSTITUTE FOR MEDICAL RESEARCH
Established 1979A Constituent of the College of Health Sciences

INSTITUTIONAL REVIEW BOARD

Phone: +233-302-916438 (Direct)
+233-289-522574
Fax: +233-302-502182/513202
E-mail: nirb@noguchi.ug.edu.gh
Telex No: 2556 UGL GH

My Ref. No: DF 22
Your Ref. No:

University of Ghana
Post Office Box LG 581
Legon, Accra
Ghana

4th April, 2017

ETHICAL CLEARANCE

FEDERALWIDE ASSURANCE FWA 00001824 **IRB 00001276**
NMIMR-IRB CPN 036/16-17 amend. 2017 **IORG 0000908**

On 4th April, 2017 the Noguchi Memorial Institute for Medical Research (NMIMR) Institutional Review Board (IRB) conducted an expedited review and approved your amended protocol titled:

TITLE OF PROTOCOL : Examining the role of self-care in the management of type 2 Diabetes Mellitus at Korle-Bu Teaching Hospital

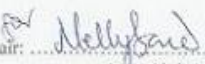
PRINCIPAL INVESTIGATOR : Mavis Abena Nam, MPhil cand.

Please note that a final review report must be submitted to the Board at the completion of the study. Your research records may be audited at any time during or after the implementation.

Any modification of this research project must be submitted to the IRB for review and approval prior to implementation.

Please report all serious adverse events related to this study to NMIMR-IRB within seven days verbally and fourteen days in writing.

This certificate is valid till 1st November, 2017. You are to submit annual reports for continuing review.

Signature of Chair: 
Mrs. Chris Dadzie
(NMIMR – IRB, Chair)

APPENDIX B: INTRODUCTORY LETTER

SCHOOL OF NURSING
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA
LEGON

Telephone: 0302-513255 (Dean)
Ext. 6206
0302-513250 } Secretary
028 9531213 }

Fax: 513255
E-mail: nursing@ug.edu.gh



P. O. Box LG 43
LEGON, GHANA

Our Ref: SON/A.12
Your Ref:

21st March 2017

The Medical Director
National Diabetes Management and Research Centre
Korle-Bu Teaching Hospital
P. O. Box 77, Korle Bu
Accra, Ghana

Dear Sir/Madam,

INTRODUCTORY LETTER FOR MAVIS ABENA NAM

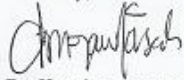
I am honoured and privileged to introduce my student, Ms. Mavis Abena Nam. She is a student under my supervision at the School of Nursing in the University of Ghana, Legon. Currently, she is in part II of the Master of Philosophy (MPhil.) programme in nursing and she is progressing well.

As part of the programme, she is expected to undertake a research project under supervision. Her proposed research topic is **“Examining the Role of Self-Care in the Management of Type 2 Diabetes Mellitus at the Korle-Bu Teaching Hospital”**. The student intends to use the National Diabetes Management and Research Centre (NDMRC) as the main setting of her research.

It will be appreciated if the student is given the necessary assistance.

Please if you would like to discuss this further, do not hesitate to contact me.

Sincerely,



Dr. Kwadwo Ameyaw Korsah

(Supervising Lecturer)

School of Nursing

P.O. Box LG. 43

College of Health Sciences

University of Ghana, Legon, Ghana, West Africa.

E- mail:

korsah19@yahoo.com/kakorsah@ug.edu.gh

Mobile Phone Number: +233 243547317



NATIONAL DIABETES MANAGEMENT AND RESEARCH CENTRE

FAX: 021 671047

TEL: 021 671047

Email:



Korle-Bu Teaching Hospital,
P.O. Box 77, Korle-Bu,
Accra, Ghana.

REPUBLIC OF GHANA

My Ref No

Your Ref No.

VISITING STUDENT RESEARCH PROJECT/ATTACHMENT FORM (To be completed in duplicate)

Please note: Students wishing to undertake research at the NDMRC are expected to submit a proposal and consent form relating to their work along with this form before they will be allowed to start their project at our Centre

Full Name of Student MAYIS ABENA NANA Age 34 yrs Male ☒ Female ☐
Tel No. 0243.311371 / 0260999185 Email mayis.abena@yahoo.com
Alternative Contact Person's Name (Parent/Guardian/Spouse) DENNIS EHIAKPOR Tel. 0243.45181

Status of Student (tick and complete): Degree Student ☐ Programme.....
Graduate Student ☒ Programme M.P.H.L. NURSING
Other, please specify.....

Supervisor at NDMRC (the student is to discuss this with his/her Main Supervisor).....
Purpose of Visit /Title of Student Project: EXAMINING THE ROLE OF SELF-CARE IN THE MANAGEMENT OF TYPE 2 DIABETES MELLITUS AT KORLE-BU TEACHING HOSPITAL
List all Resources and Facilities that will be needed by student at NDMRC: STATISTICAL DATA, PATIENTS RECORDS, PATIENTS
Anticipated Start date of Visit. 03.04.17 Completion date 28.04.17

INSTITUTIONAL ENDORSEMENT

Name of Student's Academic Institution UNIVERSITY OF GHANA Department NURSING

Title and Name of Main Supervisor of student DR. KWADWO A. KORSAN Highest Qualification P.H.D
Address SCHOOL OF NURSING, COLLEGE OF HEALTH SCIENCES, UNIVERSITY OF GHANA, P.O. BOX LG 43, LEGON
Tel 0243.547317 Email KORSAN@YAHOO.COM

As the main Supervisor, I undertake to ensure that a copy of the student's examined long essay, dissertation, thesis or report of the visit will be sent to the Director, National Diabetes Management and Research Centre, Korle Bu, Accra.

Cherawfersch
Signature of Main Supervisor

20-03-17
Date

DEPARTMENT OF
SCHOOL OF
COLLEGE OF HEALTH
SCIENCE
Official Stamp of Student's Department

SECTION TO BE COMPLETED AT NDMRC, KORLE BU

Inputs needed ☐ Yes ☐ NoHonoraria to clients ☐ Yes ☐ NoApproval Given ☐ Yes ☐ No

Signature of Director, NDMRC

Date

APPENDIX D: CONSENT FORM

CONSENT FORM

Title of Study: Examining the Role of Self-Care in the Management of Type 2 Diabetes Mellitus at the Korle- Bu Teaching Hospital.

Principal Investigator: Mavis Abena Nam

Address: School of Nursing, College of Health Sciences, University of Ghana, P. O. Box LG 43, Legon - Accra

General Information Sheet

Introduction

Dear Participant,

I am a graduate nursing student from the School of Nursing, University of Ghana, Legon. I am carrying out a research on the management of Diabetes Mellitus (D.M), a requirement for the completion of my Master of Philosophy (MPhil) degree programme.

Nature of Research

This research is an academic research and the information that respondents will provide will be used for academic purposes only. The research is on type 2 diabetes, an acquired form of diabetes mellitus which happens when the amount of insulin produced is not enough for the body's needs or the body's cells become resistant to it. The purpose of the study is to examine the role of self- care among Type 2 Diabetes patients. That is; to find out the knowledge, self-care behaviours and activities commonly performed by /diabetes patients, factors that influence

these behaviours and patients' coping strategies and the impact of these activities on the blood glucose level of diabetes patients.

Participants Involvement

You are invited to participate in this research. All you need to do is complete this questionnaire in English on the spot and hand it over to the researcher after completion. This would take approximately 40 minutes of your time. If you prefer to communicate in Ga, Ewe or Twi, then our interaction will take the form of a structured interview where the researcher will translate and interpret questions on the questionnaire into the local dialect (Ga or Twi) for you, solicit for answers from you and provide the feedback on the paper as per each participant's response. The researcher will assist diabetes patients with poor eye sights to read and complete the survey.

Responses will be completely anonymous; your name will not appear anywhere on the survey but numbers will be assigned to the questionnaires and only my supervisors will have access to the tools. With your permission, the values of your weight, height, waist, hip and blood glucose (FBS and HbA1c) will be retrieved from your folder and recorded on the questionnaire before it is given to you to fill.

There will be no right or wrong answer hence feel free and provide honest answers by using figures, alphabets, yes or no or short answers where applicable. All information will be kept under lock and key in a cabinet at the researcher's office at Mampong Nursing and Midwifery Training College for about 5 years after the study and thereafter destroyed.

Completing and returning the questionnaire constitutes your consent to participate. If you do not wish to participate, kindly give the questionnaire back to the researcher.

- **Possible Risks and Discomforts**

The study is not expected to pose any risk to you as a participant. The findings of this research will be published in academic journals.

- **Possible benefits**

The study may not give a direct benefit to you immediately, however I hope findings will impact Clinical practice, Education, Research, Policy making and as researchers, we will get a better understanding on how to care for diabetes patients.

- **Confidentiality**

The information you will give about yourself and how you manage your condition will be protected and used for academic purposes only. Your name will not appear on the questionnaire nor be used in any part of the study. All information on the questionnaires used for this study will be stored in a cabinet under lock and key in the researcher's office at Mampong Nursing and Midwifery Training College. The completed questionnaires will only be accessible to the researcher and her supervisors.

- **Compensation**

You will not be given any fiscal or monetary compensation for taking part in this study. Snack or lunch (rice and stew) will be provided at the end of data collection.

- **Voluntary Participation and Right to Leave the Research**

Your participation is voluntary. You have the right to take part in this study or refuse participation or withdraw from the study at any stage. If you decide not to take part in this research or pull out, there will be no penalty and the care or treatment you are receiving will also not be influenced by your decision. You are permitted to back-out from the study at any point in time even after you have agreed to be part of the study or half way through answering of the questionnaires.

- **Your rights as a Participant**

This study is approved by the Ethical Review Committee of Korle – Bu Teaching Hospital and Institutional Review Board of Noguchi Memorial Institute for Medical Research (NMIMR-IRB). If you have any questions bothering you about your rights as a research respondent, you can contact the IRB Office between the hours of 8am-5pm through

1. Landline 0302916438 and email: nirb@noguchi.ug.edu.gh. (for NMIMR-IRB)
2. The Administrator of Research and Development Unit, KBTH on 233-302666766, email address of rdo@kbth.gov.gh

- **Additional contacts:** If you have any concerns, you may contact the researcher or her supervisors using the following addresses:

Mavis Abena Nam, Email: msticah@yahoo.com, Phone number: 0243319371/ 0260999185

Dr. Kwadwo Ameyaw Korsah, Email: korsah19@yahoo.com Phone number: 0243547317

Mr. Gladstone Fakor Agbakpe, Email: gladstonef@yahoo.com Phone number: 0277137467

Thank you.

VOLUNTEER AGREEMENT

The above document on “Examining the Role of Self-Care in the Management of Type 2 Diabetes Mellitus at the National Diabetes Management and Research Centre (NDMRC) of the Korle – Bu Teaching Hospital has been read and explained to me. I have been given opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

Date

Name and signature or thumb print of volunteer

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

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

Date

Name and signature of witness

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

Date

Name Signature of Person Who Obtained Consent

APPENDIX E: QUESTIONNAIRE

UNIVERSITY OF GHANA

SCHOOL OF NURSING

QUESTIONNAIRE ON SELF- CARE MANAGEMENT OF DIABETES MELLITUS

*Preamble: This is an academic research, a requirement for the completion of my MPhil degree programme. The study is to ascertain the knowledge, Self- Care behaviours and activities commonly performed by diabetes patients in the management of their condition. I therefore seek your consent in answering a few questions on the Self- Care management of diabetes mellitus. Your privacy and confidentiality is highly assured as all answers provided by respondents would be used for **ONLY** academic purposes. Please provide honest answers. Thank you!*

GENERAL INFORMATION- ALL PARTICIPANTS

Date of Survey: Name of interviewer:

Region: Greater Accra Hospital: Korle- Bu Teaching Hospital (Diabetes Clinic)

PART 1

BP- Waist/Hip-

DEMOGRAPHIC CHARACTERISTICS

1. SEX (a) Male ☐ (b) Female ☐ 2. FBS 3. Hb A1c %

4. WEIGHT Kg 5. HEIGHT 6. BMI

7. AGE OF RESPONDENT:

8. RESIDENCE

9. How many people are in your household?

10. EDUCATIONAL BACKGROUND

(a) No formal education ☐ (b) Primary ☐ (c) JSS / JHS/ Middle school ☐
(d) SSS/SHS/ Sixth Form ☐ (e) Tertiary ☐ (f) Vocational ☐

11. OCCUPATION

- (a) Employed ☐ (b) Unemployed ☐ (c) Retired ☐ (d.) Disabled not able ☐
to work

12. MARITAL STATUS

- (a) Married ☐ (b) Single ☐ (c) Divorced / Separated ☐ (d) Widow/ Widower ☐

13. RELIGION

- (a) Christian ☐ (b) Muslim ☐ (c) Traditional ☐

14. Ethnicity of respondents.

15. Number of Years living with diabetes:

16. What age were you diagnosed of diabetes ?

17. What complication of diabetes do you have?

18. Do you have any family history of diabetes? a. Yes ☐ b. No ☐

19. Do you have National health insurance? a. Yes ☐ b. No ☐

20. What type of diabetes medications are you on?

- A. An insulin shot, once or twice daily.
- B. An insulin shot, thrice or more daily.
- C. One type of diabetes pills taken once daily to control my blood sugar level.
- D. One type of diabetes pills taken twice daily.
- E. Two or more types of diabetes pills taken more than once daily.
- F. No medication either insulin or pills have been prescribed for my diabetes.

PART 2**RESPONDENTS' PERCEPTION ON DIABETES DISEASE**

Please read each statement and provide short answers, yes or no, or tick 1- 5 (strongly disagree - strongly agree) which indicate the most appropriate answer as per your opinion.

1. What is your perception on symptoms associated with diabetes?

- | | | |
|-------------------------------------|--------|-------|
| a. Hyperglycemia (high blood sugar) | a. Yes | b. No |
| b. Hypoglycemia (low blood sugar) | a. Yes | b. No |
| c. Anxiety | a. Yes | b. No |
| d. Fatigue | a. Yes | b. No |
| e. Numbness | a. Yes | b. No |
| f. Infection | a. Yes | b. No |
| g. Changes in vision | a. Yes | b. No |

2. In your view, what causes diabetes mellitus?

a.	Hereditary- it runs in the family	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
b.	My own behaviour	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
c.	Ageing	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
d.	Stress or worry	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
e.	Diet or eating habits	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
f.	My emotional state	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
g.	My mental attitude	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
h.	Family problems or worries	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree

i.	Overwork	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
j.	Altered immunity	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
k.	My personality	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
l.	Poor medical care in the past	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
m.	Smoking	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
n.	A germ or virus	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
o.	Chance or bad luck	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
p.	Alcohol	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
q.	Accident or injury	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
r.	Pollution in the environment	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
s.	Others	1.Stron. Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree

Tick the correct answer (1- 5) as per your opinion

3.	Diabetes is serious.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
4.	This illness has major consequences on my life.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
5.	This illness does not have much effect on my life .	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
6.	This illness strongly affects the way others see me.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
7.	Diabetes has serious financial consequences on me.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
8.	My condition causes difficulties for those who are close to me.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
9.	Symptoms of diabetes condition last for a short time.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
10.	Diabetes is likely to be permanent rather than temporary.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
11.	I expect to live with this illness for the rest of my life.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
12.	My condition will improve in time.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
13.	I can do a lot to control my symptoms. (I have the power to influence my illness).	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
14.	What I do can determine whether my illness gets better or worse.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
15.	Diabetes medication will be effective in curing my illness.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
16.	The negative effects of diabetes can be prevented by medical treatment.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree

17.	There is nothing which can help my condition.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
18.	The symptoms are puzzling to me.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
19.	I do not understand this illness.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
20.	I have a clear picture or understanding of my condition.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
21.	The symptoms of my condition come and go in cycles.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
22.	I get depressed when I think about my illness.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
23.	This illness makes me angry.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
24.	This illness does worry me.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
25.	Having this illness makes me feel anxious.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree
26.	This illness makes me afraid.	1.Strongly Disagree	2.Disagree	3.Agree	4.Mod. Agree	5.Stron. agree

PART 3

COPING STRATEGIES OR PROCEDURES

These items deal with ways you've been coping with diabetes in your life since you found out you had diabetes. Please read each statement and provide answers (0- 3) which indicate whether or not you are doing or using it. Make your answers as true for you as you can.

0. Does not apply or not used (Never)
1. Used a little bit (Sometimes)
2. Used a medium amount (Often)
3. Used a great deal or a lot (Always)

1.	I make up my mind to fight this condition hence concentrate my efforts on doing something about it.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
2.	I use alcohol or other drugs to make myself feel better.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
3.	I get emotional support from people (friends, family members).	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
4.	I give up on the attempt to cope with self- care.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
5.	I plan for the future e.g. regular visit to hospital, active practice of self –care	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
6.	I refuse to believe that I have diabetes.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
7.	I express negative feelings when symptoms persist.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
8.	I keep hoping there will be a cure or some other good news for me	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
9.	I get help and advice from people who have had similar experiences and how they self - managed their condition.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
10.	I try to find out more about diabetes, possible causes and treatment from other people.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
11.	I ask the doctors for information regarding the progress of my condition.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
12.	I make jokes about how hard it is for me to control my condition.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
13.	I accept the reality that numerous complications may develop if I don't control my diabetes.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
14.	I try to find comfort in my religion or spiritual beliefs by	☐ 0	☐ 1	☐ 2	☐ 3

	praying, meditating and trusting God for divine healing.	Never	Sometimes	Often	A.Always
15.	I take herbal medications.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
16.	I've been criticizing myself.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always

PART 4**DIABETES SELF-CARE MANAGEMENT ACTIVITIES**

The following statements describe self-care activities related to your diabetes. Thinking about your self-care over the last two (2) months please tick the number (0 – 3) which indicates the extent to which each statement applies to you. There are no right or wrong answers.

The rating are as follows:

- 0 Does not apply to me - NEVER
- 1 Applies to me to some degree, or some of the time - SOMETIMES
- 2 Applies to me to a considerable degree, or a good part of time - OFTEN
- 3 Applies to me very much, or most of the time - ALMOST ALWAYS

1.	I check my blood sugar levels with care and attention. ☐ Blood sugar measurement is not required as a part of my treatment.	☐ 0 Never applies	☐ 1 Sometimes Apply	☐ 2 Often applies	☐ 3 A.Always
2.	The food I choose to eat makes it easy to achieve optimal blood sugar levels	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
3.	I keep all doctors' appointments recommended for my diabetes treatment.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
4.	I take my diabetes medication (e. g. insulin, tablets) as prescribed. ☐ Diabetes medication / insulin is not required as a part of my treatment.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
5.	Occasionally I eat lots of sweets or other foods rich in	☐ 0	☐ 1	☐ 2	☐ 3

	carbohydrates.	Never	Sometimes	Often	A.Always
6.	I record my blood sugar levels regularly ☐ Blood sugar measurement is not required as a part of my treatment.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
7.	I get low level exercise example walking on a daily basis	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
8.	I do regular physical activity under supervision to achieve optimal blood sugar levels.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
9.	I strictly follow the dietary recommendations given by my doctor or diabetes specialist.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
10.	I avoid physical activity, although it would improve my diabetes.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
11.	I tend to forget to take or skip my diabetes medication (e. g. insulin, tablets). ☐ Diabetes medication / insulin is not required as a part of my treatment.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
12.	Sometimes I have real ‘food binges’ (not triggered by hypoglycaemia.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
13.	Regarding my diabetes care, I should see my medical practitioner(s) more often.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
14.	I tend to skip planned physical activity.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
15.	I usually check my feet and wash them.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
16.	I always dry in between my toes after washing my feet.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
17.	Sometimes I do inspect the inside of my shoes before wearing. Them	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always

18.	Occasionally I walk bare footed.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
19.	Occasionally I take alcohol.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
20.	I tend to smoke occasionally.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
21.	I have difficulty in making lifestyle changes.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always
22.	My diabetes self-care is poor.	☐ 0 Never	☐ 1 Sometimes	☐ 2 Often	☐ 3 A.Always

