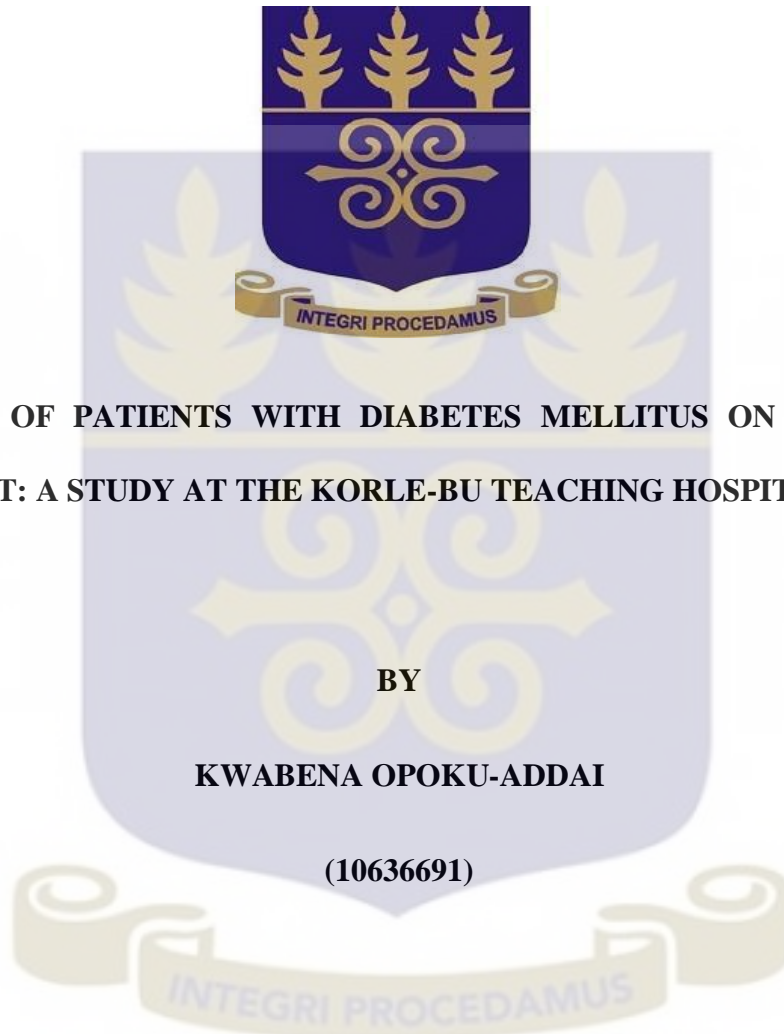


**UNIVERSITY OF GHANA**

**COLLEGE OF HEALTH SCIENCES**

**SCHOOL OF NURSING AND MIDWIFERY**



**KNOWLEDGE OF PATIENTS WITH DIABETES MELLITUS ON NUTRITIONAL  
MANAGEMENT: A STUDY AT THE KORLE-BU TEACHING HOSPITAL, ACCRA**

**BY**

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PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MPhil  
IN NURSING DEGREE**

**JULY, 2019**

**DECLARATION**

I, Kwabena Opoku-Addai, do hereby declare that this thesis is the result of my research work undertaken with the supervision and guidance of Dr. Kwadwo Ameyaw Korsah and Dr. Gwendolyn Mensah of the School of Nursing and Midwifery of University of Ghana. This work has not been presented in whole or part to any other institution for the award of any certificate or degree. All the references used for this study have been duly acknowledged.

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### **ABSTRACT**

The rising mortality rate of diabetes mellitus and the upsurge in diabetes complications is very alarming. This has been attributed to the poor knowledge patients living with diabetes have on diabetes and its management, especially the nutritional management. This study sought to explore the knowledge on nutritional management of diabetes mellitus among patients living with diabetes mellitus who attended clinic at the National Diabetes Management and Research Centre of the Korle-Bu Teaching Hospital. An exploratory descriptive qualitative research design was used for this study. Purposive sampling was used to recruit fifteen participants for the study. The participants were interviewed using a semi-structured interview guide which was developed using the Information-Motivation-Behavioural Skills model which defined the research objectives and served as the organizing framework for the study. Data was analyzed using thematic content analysis approach, out of which five main themes emerged. The main themes identified were knowledge on nutritional management of diabetes, motivation to undertake nutritional management of diabetes, support systems relied on in the care and management of diabetes, skills or practices on nutritional management of diabetes, and challenges to adherence of optimal nutritional management of diabetes. The study revealed that the participants have adequate knowledge on the nutritional management of diabetes, they are well motivated and have varied support systems that enable them to engage in healthy eating. They also have adequate meal planning skills, and generally engage in optimal nutritional management of their condition due to their healthy dietary practices. In addition, the study found that the participants have poor knowledge on diabetes peer support groups and do not participate in such groups, as well as have deficient knowledge and skills in the reading and usage of food labels. There is the need to equip patients with diabetes with the needed knowledge and skills on food label reading, educate them on diabetes peer support groups, and integrate them into these groups. It is therefore suggested that health care professionals such as nurses and doctors should find practical and robust ways to factor these elements into patients care and management in general. It is also recommended that future research should be considered in multiple sites in order to generalize the findings. It is concluded that patients with diabetes mellitus may be able to engage in optimal nutritional management if they are motivated and offered the needed and reliable information by health care professionals such as nurses on the nutritional care of their condition.

**DEDICATION**

I dedicate this work to my parents, Pastor James Opoku-Addai and Mrs. Mary Opoku-Addai, and also to my siblings, Yaa Opoku-Addai, Yaa Boadiwaa Opoku-Addai, Kofi Nsiah Opoku-Addai, and Mrs. Rachel Tuffour for their valuable and immense contribution and support throughout my studies.

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**TABLE OF CONTENTS**

DECLARATION .....	i
ABSTRACT .....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENT .....	iv
TABLE OF CONTENTS .....	v
LIST OF TABLES .....	xii
LIST OF FIGURES .....	xiii
LIST OF ABBREVIATIONS.....	xiv
CHAPTER ONE .....	1
INTRODUCTION .....	1
1.1 BACKGROUND OF THE STUDY .....	1
1.2 PROBLEM STATEMENT .....	6
1.3 PURPOSE OF THE STUDY .....	8
1.4 OBJECTIVES OF THE STUDY .....	8
1.5 RESEARCH QUESTIONS.....	9
1.6 SIGNIFICANCE OF THE STUDY .....	9
1.7 OPERATIONAL DEFINITIONS .....	10
CHAPTER TWO .....	11

LITERATURE REVIEW .....	11
2.1 CONCEPTUAL FRAMEWORKS.....	12
2.1.1 INFORMATION-MOTIVATION-BEHAVIOURAL SKILLS (IMB) MODEL .....	12
2.1.2 KNOWLEDGE-TO-ACTION (KTA) FRAMEWORK.....	16
2.1.3 LIMITATIONS OF THE KNOWLEDGE-TO-ACTION FRAMEWORK AND MY REASONS FOR CHOOSING THE INFORMATION-MOTIVATION-BEHAVIOURAL SKILLS MODEL FOR THIS STUDY .....	20
2.2 KNOWLEDGE OF PATIENTS WITH DIABETES ON THE NUTRITIONAL MANAGEMENT OF DIABETES MELLITUS.....	22
2.3 THE MOTIVATION OF PATIENTS LIVING WITH DIABETES TO UNDERTAKE THE NUTRITIONAL MANAGEMENT OF THEIR CONDITION.....	25
2.4 THE BEHAVIOURAL SKILLS PATIENTS LIVING WITH DIABETES EMPLOY IN THE NUTRITIONAL MANAGEMENT OF THEIR CONDITION .....	29
2.5 SUMMARY CRITIQUE OF THE LITERATURE REVIEW .....	36
CHAPTER THREE.....	38
RESEARCH METHODS.....	38
3.1 RESEARCH DESIGN .....	38
3.2 SETTING OF THE STUDY.....	39
3.3 TARGET POPULATION .....	41
3.4 INCLUSION CRITERIA.....	41
3.5 EXCLUSION CRITERIA.....	41

3.6 SAMPLE SIZE AND SAMPLING TECHNIQUE .....	41
3.7 PILOTING OF INSTRUMENT .....	43
3.8 DATA COLLECTION TOOL .....	43
3.9 DATA COLLECTION PROCEDURE.....	44
3.10 DATA MANAGEMENT .....	46
3.11 DATA ANALYSIS.....	46
3.12 METHODOLOGICAL RIGOUR .....	48
3.13 ETHICAL CONSIDERATIONS .....	50
CHAPTER FOUR.....	52
FINDINGS.....	52
4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS .....	52
4.2 ORGANIZATION OF THEMES AND SUB-THEMES .....	54
4.3 KNOWLEDGE ON NUTRITIONAL MANAGEMENT OF DIABETES .....	56
4.3.1. LIFESTYLE BEFORE DIAGNOSIS (IGNORANCE OF REPERCUSSIONS OF POOR LIFESTYLE BEFORE DIAGNOSIS) .....	56
4.3.2 KNOWLEDGE ON FOODS TO TAKE AND AVOID .....	58
4.3.3 KNOWLEDGE ON HEALTHY EATING HABITS .....	64
4.3.4 SOURCE OF KNOWLEDGE ON DIABETES MANAGEMENT .....	65
4.4 MOTIVATION TO UNDERTAKE NUTRITIONAL MANAGEMENT OF DIABETES	66
4.4.1 INTRINSIC MOTIVATION .....	67

4.4.2 EXTRINSIC MOTIVATION .....	68
4.5 SUPPORT SYSTEMS RELIED ON IN THE CARE AND MANAGEMENT OF DIABETES .....	69
4.5.1 MEDICAL SUPPORT .....	70
4.5.2 SUPPORT FROM FAMILY .....	70
4.5.3 SPIRITUAL SUPPORT .....	71
4.5.4 SUPPORT FROM FRIENDS .....	71
4.5.5 DIABETES PEER SUPPORT GROUPS.....	72
4.6 SKILLS/PRACTICES ON NUTRITIONAL MANAGEMENT OF DIABETES.....	73
4.6.1 DIETARY PRACTICES IN THE MORNING, AFTERNOON, AND EVENING .....	73
4.6.2 READING OF FOOD LABELS.....	85
4.6.3 MEAL PLANNING .....	87
4.7 CHALLENGES TO ADHERENCE OF OPTIMAL NUTRITIONAL MANAGEMENT OF DIABETES .....	88
4.8 REFLECTIONS OF THE RESEARCHER ON THE FINDINGS .....	90
4.9 SUMMARY OF FINDINGS .....	91
CHAPTER FIVE .....	93
DISCUSSION OF FINDINGS .....	93
5.1 KNOWLEDGE ON NUTRITIONAL MANAGEMENT OF DIABETES.....	93

5.1.1 LIFESTYLE BEFORE DIAGNOSIS (IGNORANCE OF REPERCUSSIONS OF POOR LIFESTYLE BEFORE DIAGNOSIS) .....	93
5.1.2 KNOWLEDGE ON FOODS TO TAKE AND AVOID .....	96
5.1.3 KNOWLEDGE ON HEALTHY EATING .....	101
5.1.4 SOURCE OF KNOWLEDGE ON DIABETES MANAGEMENT .....	104
5.2 MOTIVATION TO UNDERTAKE NUTRITIONAL MANAGEMENT OF DIABETES .....	106
5.2.1 INTRINSIC MOTIVATION .....	106
5.2.2 EXTRINSIC MOTIVATION .....	107
5.3 SUPPORT SYSTEMS RELIED ON IN THE CARE AND MANAGEMENT OF DIABETES .....	109
5.3.1 MEDICAL SUPPORT .....	109
5.3.2 SUPPORT FROM FAMILY .....	110
5.3.3 SPIRITUAL SUPPORT .....	111
5.3.4 SUPPORT FROM FRIENDS .....	112
5.3.5 DIABETES PEER SUPPORT GROUPS .....	112
5.4 SKILLS/PRACTICES ON NUTRITIONAL MANAGEMENT OF DIABETES.....	115
5.4.1 DIETARY PRACTICES IN THE MORNING, AFTERNOON, AND EVENING ...	115
5.4.2 READING OF FOOD LABELS .....	124
5.4.3 MEAL PLANNING .....	126

5.5 CHALLENGES TO ADHERENCE OF OPTIMAL NUTRITIONAL MANAGEMENT OF DIABETES .....	127
5.5.1 FINANCIAL CONSTRAINTS.....	128
5.5.2 NON-AVAILABILITY OF PREFERRED FOODS.....	129
5.5.3 LOSS OF APPETITE.....	130
5.5.4 JOB DEMANDS .....	130
5.5.5 APPETITE/DESIRE FOR FOODS TO AVOID .....	131
5.6 EFFECTIVENESS OF THE MODEL USED FOR THIS STUDY (INFORMATION-MOTIVATION-BEHAVIOURAL SKILLS MODEL) .....	132
CHAPTER SIX.....	134
SUMMARY, IMPLICATIONS, LIMITATIONS, CONCLUSION, AND RECOMMENDATIONS .....	134
6.1 SUMMARY OF THE STUDY .....	134
6.2 IMPLICATIONS OF THE STUDY .....	136
6.2.1 NURSING PRACTICE .....	136
6.2.2 NURSING RESEARCH.....	137
6.2.3 NURSING EDUCATION .....	137
6.2.4 POLICY FORMULATION.....	138
6.3 LIMITATIONS OF THE STUDY .....	139
6.4 HOW THIS RESEARCH HAS INFLUENCED THE RESEARCHER .....	139

6.5 CONCLUSION .....	140
6.6 RECOMMENDATIONS .....	141
6.6.1 NURSING AND MIDWIFERY COUNCIL OF GHANA .....	141
6.6.2 MINISTRY OF HEALTH .....	141
6.6.3 KORLE-BU TEACHING HOSPITAL .....	142
REFERENCES .....	144
APPENDICES .....	186
APPENDIX A: INTRODUCTORY LETTER TO NMIMR – IRB .....	186
APPENDIX B: INTRODUCTORY LETTER TO STUDY SETTING OR KBTH – IRB .....	187
APPENDIX C: ETHICAL CLEARANCE FROM NMIMR – IRB .....	188
APPENDIX D: CONSENT FORM.....	189
APPENDIX E: SCIENTIFIC AND TECHNICAL APPROVAL FROM KBTH .....	195
APPENDIX F: ETHICAL CLEARANCE FROM KBTH – IRB.....	196
APPENDIX G: APPROVAL LETTER TO HEAD OF NDMRC OF KBTH.....	197
APPENDIX H: INTERVIEW GUIDE.....	198
APPENDIX I: SUMMARY OF SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS.....	201

**LIST OF TABLES**

Table 4.1: Socio-demographic Characteristics of Participants .....	53
Table 4.2: Themes and Sub-themes .....	55

**LIST OF FIGURES**

Figure 2.1: The IMB Model .....12

Figure 2.2: The KTA Model .....16

Figure 3.1: The District Map of Greater Accra Region, showing the location of Korle-Bu Teaching Hospital and its environs .....39

**LIST OF ABBREVIATIONS**

<b>NCDs</b>	Non-communicable Diseases
<b>WHO</b>	World Health Organization
<b>HIV</b>	Human Immunodeficiency Virus
<b>AIDS</b>	Acquired Immune Deficiency Syndrome
<b>IMB</b>	Information-Motivation-Behavioural Skills
<b>KTA</b>	Knowledge-To-Action
<b>ADA</b>	American Diabetes Association
<b>NDMRC</b>	National Diabetes Management and Research Centre
<b>KBTH</b>	Korle-Bu Teaching Hospital
<b>IRB</b>	Institutional Review Board
<b>NMIMR</b>	Noguchi Memorial Institute for Medical Research
<b>JHS</b>	Junior High School
<b>SHS</b>	Senior High School

## **CHAPTER ONE**

### **INTRODUCTION**

This chapter includes the background of the study on the level of knowledge on nutritional management of diabetes mellitus among patients with diabetes, the problem statement, the purpose of the study, the objectives of the study, the research questions, the significance of the study, and the operational definition of keywords used in the study.

#### **1.1 BACKGROUND OF THE STUDY**

The major cause of mortality worldwide is due to non-communicable diseases (NCDs). According to the World Health Organization (WHO), NCDs accounted for forty million (seventy percent) of the fifty-six million deaths that occurred worldwide in 2015, and more than eighty percent of these deaths affected low-income to middle-income countries (World Health Organization, 2017b). More shockingly, it has also been projected by WHO that, mortality due to NCDs are likely to rise worldwide by seventeen percent within the next ten years, with Africa expected to experience an additional twenty-eight million deaths, which is a twenty-seven percent rise in deaths from these conditions. Deaths from NCDs will thus exceed the combined deaths from maternal, communicable, nutritional, and perinatal diseases by 2030 (World Health Organization, 2017b). In Ghana, NCDs lead to a substantial number of illness, disability, and death (Ghana Health Service, 2017). According to WHO, NCDs result in 86,200 deaths per year in Ghana, with about fifty-six percent of these deaths occurring in persons below seventy years of age (Ghana Health Service, 2015). Diabetes, cancer, cardiovascular diseases, sickle cell disease, and chronic respiratory diseases are the major NCDs in Ghana (Ghana Health Service, 2017).

Diabetes mellitus accounts for a high mortality and morbidity globally (Lim et al., 2012). The third highest predisposing factor for premature deaths worldwide is high blood glucose (International Diabetes Federation, 2015). Diabetes prevalence has significantly increased in most countries over the past four decades (Pearson-Stuttard et al., 2017). The number of people living with diabetes worldwide has risen by four times since 1980, from 108 million (which is a 4.7% prevalence) in 1980 to 422 million (which is an 8.5% prevalence) in 2014 (World Health Organization, 2017a), excluding the high numbers of undiagnosed cases estimated at 175 million (Beagley, Guariguata, Weil, & Motala, 2014). In 2017, this number increased, as 425 million adults were living with diabetes mellitus globally in 2017 (Wang & Hu, 2018).

Diabetes mellitus is currently the world's most threatening epidemic, with low-income and middle-income countries particularly experiencing this effect (Raimi et al., 2014). In sub-Saharan Africa, 21.5 million people were living with diabetes in 2013 (International Diabetes Federation, 2013). Additionally, in Africa, the prevalence of diabetes mellitus has increased drastically since 1980. This is because, in 2014, Africa recorded a diabetes prevalence of 7.1%, which is a 129% increase in prevalence since 1980 (Jaffar & Gill, 2017). More worryingly, the already high prevalence of diabetes mellitus in sub-Saharan Africa is likely to be more than double by 2035 (International Diabetes Federation, 2015). According to Ghana Health Service, the reported cases of diabetes mellitus in the country at the out-patient department increased from 189,672 in 2011 to 214,357 in 2014 (Ghana Health Service, 2015). Currently, the prevalence of adult diabetes mellitus in Ghana is about 9%. However, the burden of the disease is projected to further increase in the country (Ghana Health Service, 2017).

Diabetes can result in a variety of complications such as lower limb amputation, stroke, heart attack, blindness, and kidney diseases when the condition is untreated, uncontrolled, or

poorly managed. For people living with diabetes, their chances of lower limb amputations are ten to twenty times higher than people who are not living with diabetes (World Health Organization, 2016), and they are two times more likely to develop myocardial infarction as well as cerebrovascular accident than those who are not living with diabetes (Buse et al., 2007). Cardiovascular disease, which usually accounts for the majority of mortality among patients with diabetes results in 52% of the mortality that occur in type 2 diabetes mellitus and 44% of the mortality that occur in type 1 diabetes mellitus. Kidney diseases also result in 21% of the deaths that result from type 1 diabetes mellitus and 11% of the deaths that result from type 2 diabetes mellitus (Morrish, Wang, Stevens, Fuller, & Keen, 2001). In addition, people living with diabetes are 1.5 times more prone to developing blindness and vision loss than people without diabetes (Tumosa, 2008).

In sub-Saharan Africa, the ascendency of diabetes and its complications is a threat to the health system, as the condition and its complications have the potential to overwhelm health systems, dwindle the expenditure of households, and eventually start to reverse some of the achievements that sub-Saharan Africa has seen in many other health outcomes in recent years (Jaffar & Gill, 2017). The health expenditure of people living with diabetes is also more than three times higher than that of people who do not have diabetes (Yang et al., 2012). The severe consequences of diabetes have compelled some epidemiologists to estimate that, in the near future, the death toll and financial burden of diabetes will exceed that of HIV/AIDS (Azevedo & Alla, 2008).

In 2012, diabetes accounted for 1.5 million deaths globally, and a further 2.2 million deaths were attributed to cardiovascular and other diseases stemming from high blood glucose levels. The provision of supportive environments for living healthy lifestyles, as well as the treatment of

diabetes could have prevented the majority of these deaths (World Health Organization, 2016). The growing concern of diabetes mellitus on health makes it a major health issue. To be able to curb the rising rate of diabetes mellitus globally, it is imperative for people to be knowledgeable about the disease because the knowledge will affect their attitude and uptake of health education and health services (Baradaran & Knill-Jones, 2004). Diabetes mellitus and the complications that accompany it can be treated, delayed, and prevented with healthy eating, regular exercises, compliance to drugs, and regular screening. The morbidity and mortality rate associated with diabetes can therefore be significantly reduced by improving the control of diabetes through education, lifestyle modification, and effective treatment (Manne-Goehler et al., 2016).

Research studies have asserted that, pivotal to lifestyle modification, diabetes education, treatment, care, and management is nutritional management or healthy eating (Chen, Jiang, Tao, & Shu, 2011; Li, Jin, et al., 2017). Nutritional management decreases, delays and/or prevents the complications and deaths associated with diabetes mellitus, as well as decreases the health expenditure of patients living with diabetes mellitus (Li, Jin, et al., 2017; Miller et al., 2014). Optimal glycaemic control and improved quality of life for patients living with diabetes mellitus which are also key in diabetes management are dependent on adequate knowledge on healthy eating or optimal nutritional management (Beck et al., 2015; Chen et al., 2011; Evert et al., 2014). There is a positive correlation between patients' knowledge level on diabetes mellitus and their ability to self-manage their condition (Sousa, Zauszniewski, Musil, McDonald, & Milligan, 2004). Nonetheless, many patients with diabetes lack adequate knowledge on the nutritional management of their condition (Ball et al., 2016; Jing et al., 2016).

Also, patients with diabetes who are skilled and endowed to go about self-management of their condition would have better health outcomes (Chatterjee et al., 2017). However, despite the

enormous benefits of diabetes self-management, patients living with diabetes mellitus may not be able to self-manage their condition due to insufficient support, knowledge, and capacity to self-manage their condition (Mutea & Baker, 2008). Diabetes education is thus foundational to a successful self-management, as well as the achievement of improved health outcomes for patients with diabetes. Health care workers in all settings therefore have a responsibility of teaching and assisting patients with diabetes to live healthy lifestyles, achieve health goals, and to have sustainable glycemic control (Gerard, Griffin, & Fitzpatrick, 2010).

As a professional nurse for over four years, the researcher has come across a patient who indicated that she was diagnosed with diabetes, and was told to cut down on sugary foods. After some time, she started patronizing herbal medications since she could no longer bear the dietary restrictions, and was not satisfied with the care that was being rendered to her. She was brought back to the hospital after she had developed a complication, that is, diabetic ketoacidosis which later led to her death.

Evidence from various research studies now highlight the importance of helping people living with diabetes mellitus to acquire the needed knowledge in order to be able to self-manage their condition. However, crucial to successful self-management of diabetes mellitus is overcoming the enormous challenges that come with it. Overcoming the challenges associated with self-management of diabetes mellitus transcends educating and assisting patients living with diabetes mellitus to have adequate knowledge on their condition. They also need to be motivated in order for them to be able to undertake a successful self-management, as well as educated and assisted to have the needed skills and abilities for a successful self-management (Burke, Sherr, & Lipman, 2014). The Information-Motivation-Behavioural Skills model was therefore used for this study. The model asserts that, the ability to perform a health behaviour, for example healthy eating

or optimal nutritional management is dependent on how knowledgeable a person is with regards to the health behavior, which is usually gained through health education. Secondly, it deals with how motivated the person is to perform the health behaviour which is usually acquired through interaction with health care professionals and significant others. Lastly, it involves how equipped the person is in terms of the skills, abilities and confidence needed to be able to perform the health behavior, which is also usually acquired through health education (Fisher, Fisher, & Harman, 2009). The constructs of this model helped to identify the knowledge level of patients with diabetes on the nutritional management of their condition, how motivated they are to undertake the nutritional management of their condition, as well as the abilities and skills they employ to undertake the nutritional management of their condition.

## **1.2 PROBLEM STATEMENT**

Diabetes is currently considered as one of the major health emergencies in the twenty-first century, as one in every eleven adults have diabetes mellitus, and gestational diabetes mellitus also affects one in every six births (International Diabetes Federation, 2017). Strikingly, in 2015, five million people between the ages of twenty to seventy-nine died due to diabetes mellitus, representing one death in every six seconds (International Diabetes Federation, 2015). This number of mortality caused by diabetes surpassed the combined number of mortality caused by tuberculosis (1.5 million deaths), HIV/AIDS (1.5 million deaths), and malaria (0.6 million deaths) in 2013 (World Health Organization, 2013). Even though there was a worldwide decline in all-cause mortality in 2017, four million people between the ages of twenty to seventy-nine died due to diabetes mellitus in 2017, representing one death in every eight seconds (International Diabetes Federation, 2017). This number of mortality caused by diabetes surpassed the combined number

of mortality caused by tuberculosis (1.8 million deaths), HIV/AIDS (1.1 million deaths), and malaria (0.4 million deaths) in 2015. Furthermore, diabetes accounted for 6% of all deaths in Africa in 2017 (International Diabetes Federation, 2017).

WHO has also estimated that by 2030, diabetes mellitus will be the seventh leading cause of mortality worldwide (World Health Organization, 2017a). In Ghana, diabetes mellitus was the ninth leading cause of death among patients admitted in 2016 (Ghana Health Service, 2017). A significant number of these deaths caused by the condition and the complications that develop as a result of the condition can be prevented. The lack of proper education of patients living with diabetes mellitus and their poor knowledge on the condition has been identified as one of the major causes of the rising diabetes mortality and upsurge in diabetes complications globally (Chaurasia et al., 2010). Nutritional education and nutritional management of diabetes mellitus have been identified as key to diabetes care, the well-being of patients with diabetes, and the stabilization of glycaemic control (Hollis, Glaister, & Lapsley, 2014). Hence, crucial to the management of diabetes mellitus is the need for patients living with diabetes mellitus to have a better understanding or adequate knowledge of the condition and its management, especially the nutritional management in order to effectively self-manage their condition (Alotaibi, Al-Ganmi, Gholizadeh, & Perry, 2016).

However, to the best of the researcher's knowledge, there seems to be scanty information on the knowledge of diabetes mellitus among patients living with the condition in Ghana. It seems that a limited number of research studies have thus explored the knowledge of diabetes mellitus among patients with diabetes in Ghana, especially studies centred on their knowledge on the nutritional management of the condition. Nonetheless, various research works have cited nutritional management as the cornerstone of diabetes mellitus (Dyson et al., 2011). It is in view

of this, that this study sought to explore the knowledge on nutritional management of diabetes mellitus among patients with diabetes who attend clinic at the Korle-Bu Teaching Hospital.

### **1.3 PURPOSE OF THE STUDY**

The purpose of this study was to explore the knowledge on nutritional management of diabetes mellitus among patients living with diabetes mellitus who attend clinic at the Korle-Bu Teaching Hospital. The knowledge of the patients was also expected to bring to light how equipped they are in terms of the skills and abilities needed for diabetes nutritional management, as well as how motivated they are and what motivates them to undertake the nutritional management of their condition.

### **1.4 OBJECTIVES OF THE STUDY**

The objectives of this study were to:

1. Explore the knowledge of patients living with diabetes on the nutritional management of the condition.
2. Identify the factors that motivate patients living with diabetes mellitus to undertake nutritional management of their condition.
3. Ascertain the behavioural skills patients living with diabetes mellitus employ in the nutritional management of their condition.

### **1.5 RESEARCH QUESTIONS**

1. What do patients with diabetes know about the nutritional management of diabetes mellitus?
2. What motivates patients with diabetes to undertake nutritional management of their condition?
3. What are the skills patients with diabetes use in the nutritional management of their condition?

### **1.6 SIGNIFICANCE OF THE STUDY**

The findings of this study revealed the level of knowledge of patients with diabetes on the nutritional management of diabetes mellitus, which may enable health education programs to be designed and rolled out to fill the gaps in knowledge or practice regarding diabetes nutritional management. Also, the findings highlighted the skills patients with diabetes employ in the nutritional management of their condition, how motivated patients with diabetes are to engage in the nutritional management of their condition, the factors that motivate them to engage in the nutritional management of their condition, and the barriers they sometimes face in the nutritional management of their condition, as well as how they overcome the barriers that hinder them from engaging in effective or optimal nutritional management. The findings may again urge the hospital administrators and management to provide the needed logistics such as nutritional education and management tools and aids to help health care professionals provide better and effective nutritional health education to patients with diabetes. Additionally, the findings may inform authorities and policy makers about the provision of new guidelines and protocols on diabetes mellitus. The findings may also help incorporate other information on diabetes mellitus into the nursing

curriculum in the area of nursing education. Furthermore, the findings may unearth the need for further research works on nutritional management, knowledge, and education on diabetes mellitus in general.

### **1.7 OPERATIONAL DEFINITIONS**

**Diabetes mellitus** – It is a chronic, metabolic disorder in which a defect in insulin production, insulin action, or both leads to elevated blood glucose level.

**Knowledge** – This is having adequate information and understanding about diabetes mellitus.

**Diabetes self-management education** – It is the provision of knowledge, skills, and abilities needed for diabetes self-care to patients at risk of type 1 or type 2 diabetes mellitus and/or those living with type 1 or type 2 diabetes mellitus.

**Patients with diabetes** – This refers to people or patients who have been diagnosed of type 1 diabetes mellitus or type 2 diabetes mellitus.

**Diabetes self-management** – It refers to a group of health behaviours which include diet and nutrition management, regular exercises, blood glucose monitoring, compliance to medications, and regular screening engaged in by patients with diabetes to have better glycaemic control, prevent complications, and improve their health outcomes.

**Nutritional management** – It is the use of knowledge and skills in diet and nutrition to manage diabetes mellitus, prevent complications and improve the quality of life of patients living with diabetes mellitus.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

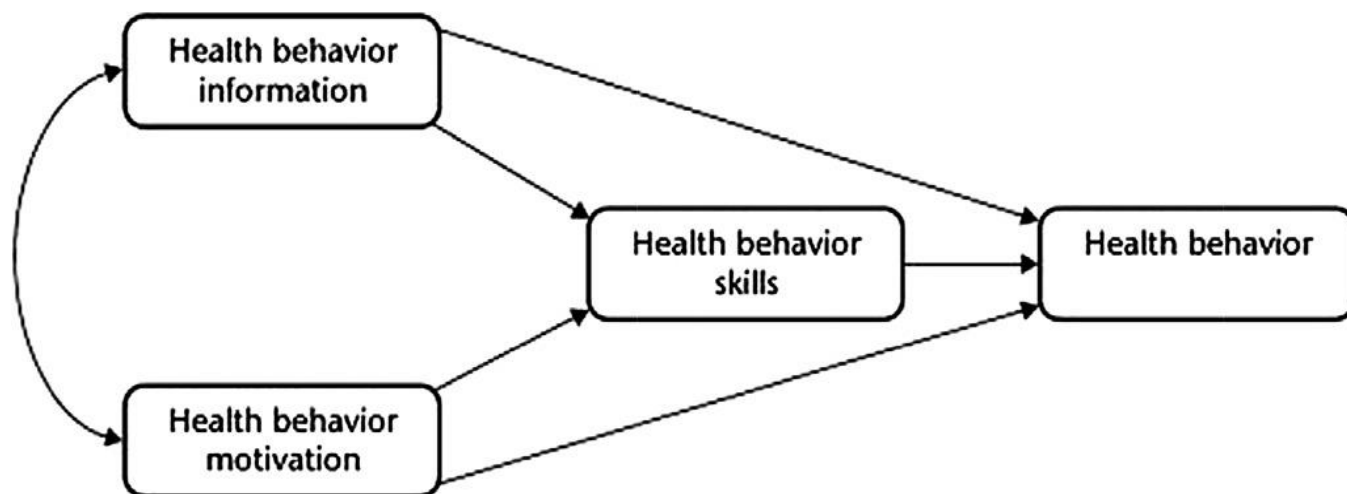
This chapter, which focuses on the literature review on nutritional management of diabetes mellitus by patients living with the condition was organized into four sections. The first section centred on the discussion of the two conceptual frameworks that were considered for this study, out of which one was finally picked. The considered frameworks included the Information-Motivation-Behavioural Skills model and the Knowledge-To-Action framework, out of which the Information-Motivation-Behavioural Skills model was selected. The second section reviewed literature on the knowledge of patients with diabetes on the nutritional management of diabetes mellitus. The third section covered the factors that motivate patients with diabetes to undertake nutritional management of their condition. Finally, the fourth section dealt with the behavioural skills patients with diabetes employ in the nutritional management of their condition. At the end of the section, a summary critique of the literature review was presented. Literature search was conducted using a number of databases which included ‘Science Direct’, ‘Medline’, ‘Sage’, ‘CINAHL’, ‘Scopus’, ‘Wiley Online Library’, ‘Ebsco host’, and ‘Cochrane library’ using key words such as ‘patients living with diabetes mellitus’, ‘patients with diabetes’, ‘knowledge’, ‘perception’, ‘awareness’, ‘nutrition’, ‘diet’, ‘diabetes mellitus’, ‘nutritional management’, ‘motivation’, ‘skills’, ‘practice’, and ‘support system’.

The next section focuses on the discussion of the conceptual frameworks.

## 2.1 CONCEPTUAL FRAMEWORKS

### 2.1.1 INFORMATION-MOTIVATION-BEHAVIOURAL SKILLS (IMB) MODEL

Figure 2.1: The IMB Model (Fisher & Fisher, 1992)



This is a health behaviour model that was developed in 1992 by Fisher & Fisher. The model asserts that, health behaviour is influenced by health behaviour information, health motivation, and health behaviour skills (Fisher & Fisher, 1992). Health behaviour is any activity individuals engage in to promote health, maintain health and/or prevent diseases. The Information-Motivation-Behavioural Skills model explains that, people will only perform a health behaviour if they have adequate information about the behaviour, when they are well motivated to perform the behaviour, and when they have the needed skills, abilities and confidence to be able to perform the behaviour (Fisher et al., 2009). Implicitly, healthy eating or proper nutritional management which is a health behaviour can only be manifested by patients with diabetes when they have adequate and accurate health information on healthy eating, when they have the motivation to do so, and when they have the needed nutritional management skills that rightly depict their ability to engage in healthy eating. For patients with diabetes to be able to perform such health behaviours also require their

ability to recognize and overcome the barriers that demoralize and prevent them from performing such behaviours (Osborn, Amico, Fisher, Egede, & Fisher, 2010). A study by Osborn and Egede (2010) found that, for a successful self-management and effective behaviour change in patients living with diabetes, diabetes educators should impart knowledge to patients with diabetes and motivate them, other than opt for the less effective means of only imparting knowledge to them.

The construct of health behaviour information refers to complete and accurate knowledge on a required or needed health behaviour. In this case, the construct of health behaviour information looks at the needed information that patients living with diabetes mellitus have on the nutritional management of diabetes. Patients with diabetes usually acquire such information from health care professionals. Health care professionals therefore need to bring their knowledge on the nutritional management of diabetes mellitus to bare by educating patients living with diabetes on all that they are supposed to know on the nutritional management of their condition, so that the patients may be knowledgeable enough to be able to undertake self-management (Osborn et al., 2010). The impartation of adequate knowledge on the nutritional management of diabetes to patients with diabetes may make the patients become knowledgeable on the sources of carbohydrates, the effect of food on blood glucose, the types of food to eat, and the quantity of food to eat so that they can be better placed to manage themselves nutritionally to obtain optimal health (Mulcahy et al., 2003; Ulrich & Abner, 2010). In simple terms, the knowledge that patients living with diabetes mellitus have regarding the nutritional management of their condition may impact their health and their quality of life in general, since it may enable them to engage in optimal self-management with regards to their diet (Osborn & Egede, 2010).

The construct of health behaviour motivation refers to the driving force that brings about readiness and eagerness in individuals to engage in a required health behaviour. In this case, the

construct of health behaviour motivation looks at the factors that motivate patients living with diabetes mellitus to engage in the nutritional management of their condition despite the complexities and challenges associated with it (Chang, Choi, Kim, & Song, 2014). Health behaviour motivation posits that, even though individuals may be knowledgeable about a certain health behaviour, they will only perform that health behaviour if they are well motivated to do so. Thus, the basis of the performance of a health behaviour by individuals is motivation, even when they have adequate knowledge on the health behaviour. Motivation consists of two components, namely, personal motivation and social motivation (Amico et al., 2009).

Personal motivation deals with beliefs and attitudes that drive the carrying out of a health behaviour, as well as one's perception of the consequences of performing a health behaviour. For instance, relative to diabetes self-care behaviour, personal motivation includes one's beliefs and attitudes that drive him or her to monitor his or her carbohydrate intake everyday in order to improve his or her glycaemic control (Osborn et al., 2010). Personal motivation of patients living with diabetes can also be ensured when a positive attitude and positive feelings on a required health behaviour, and in this case, the nutritional management of diabetes mellitus is created and developed in them (Chang et al., 2014).

Social motivation deals with an individual's belief that friends, family, and health care professionals support his or her performance of a health behaviour, and that belief compels him or her to perform the health behaviour to satisfy the wish of friends, family, and health care professionals (Gao, Wang, Zhu, & Yu, 2013). An example is when an individual has a perception that nurses and significant others believe he or she should monitor his or her carbohydrate intake everyday to manage his or her condition, and the individual does that to grant the wish of the nurses and significant others (Osborn et al., 2010). Social motivation of patients living with diabetes can

be ensured by the exploitation of their social support systems and using that to encourage and motivate them to engage in healthy eating. Health care professionals can also ensure the social motivation of patients with diabetes by introducing them to diabetes peer support groups and encouraging and/or facilitating their integration and participation in those groups. This is because, such groups provide help and motivation to its members on the need to engage in the optimal management of their condition (Chang et al., 2014).

The above discussion seems to suggest that, patients with diabetes can be motivated by creating and developing a positive attitude in them, introducing them to diabetes peer support groups, and integrating them into existing social support systems. Motivating them through these mediums can increase their ability to engage in healthy eating or optimal nutritional management, even when they are well-informed and know what to do in terms of managing their condition (Chang et al., 2014; Fisher et al., 2009).

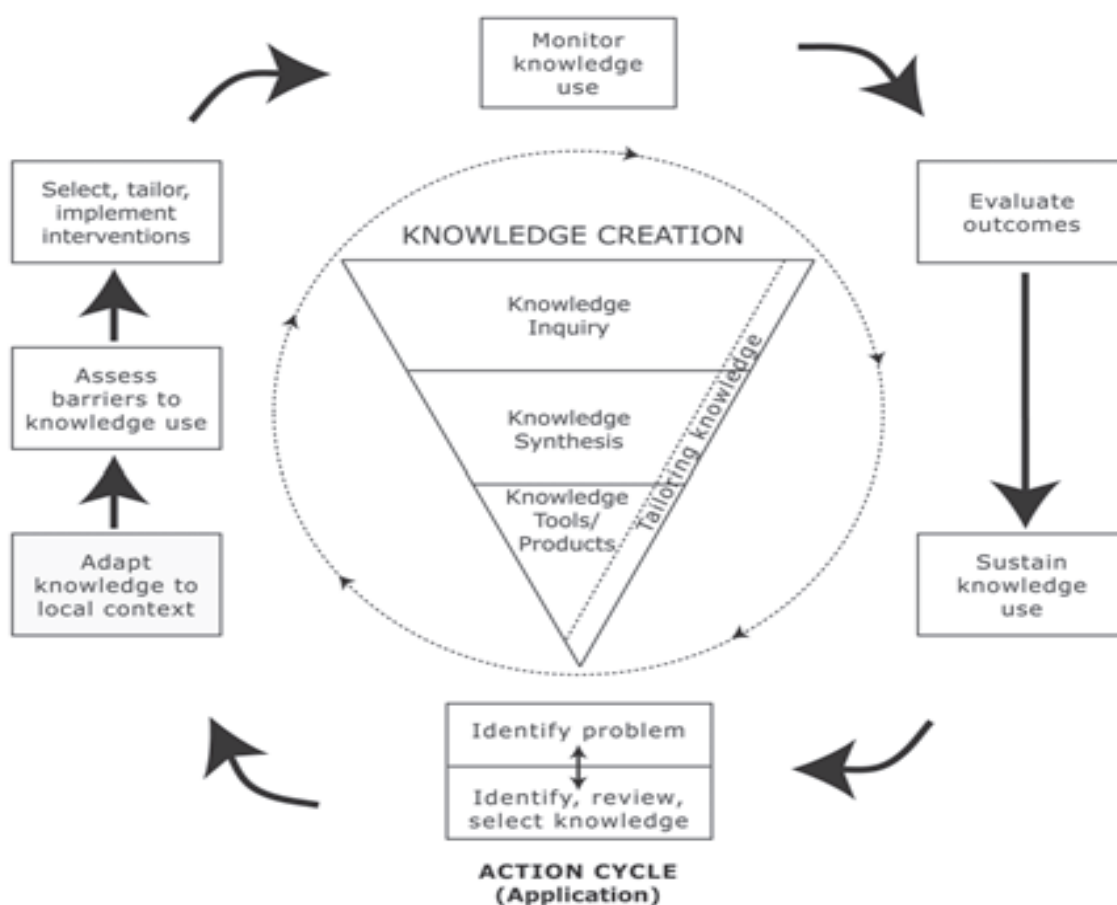
Another construct of this model is the health behaviour skills. The construct of health behaviour skills refer to the objective abilities of individuals and their self-efficacy on a required health behaviour. In this case, the construct of health behaviour skills looks at the skills, abilities and competencies patients with diabetes have on the nutritional management of diabetes mellitus (Fisher et al., 2009). The Information-Motivation-Behavioural Skills model posits that, when individuals become knowledgeable about a certain health behaviour and are well-motivated to perform the behaviour, they can only perform that health behaviour effectively when they have the needed skills, abilities and confidence to carry out the health behaviour (Osborn et al., 2010).

Effective nutritional self-management of diabetes mellitus involves the ability of patients to plan meals, as well as read food labels (Mulcahy et al., 2003; Ulrich & Abner, 2010). However, patients may only be able to do these if they possess the skills and abilities, which will then serve

as a guarantee that, they can undertake effective diabetes nutritional self-management. Thus, the ability of patients with diabetes to perform the needed health behaviour skills may enable them to undertake optimal nutritional management, which will lead to optimal health (Fisher et al., 2009).

### 2.1.2 KNOWLEDGE-TO-ACTION (KTA) FRAMEWORK

Figure 2.2: The KTA Model (Graham et al., 2006)



This framework was developed in 2006 by Graham et al., to look at how knowledge is acquired, how to translate knowledge into action, and how to advance the use of research knowledge (Graham et al., 2006). The ability of patients living with diabetes mellitus to effectively self-manage their condition is dependent on their knowledge on the condition and its management.

The knowledge patients living with diabetes possess on how to go about the self-management of their condition will enable them to effect optimal nutritional management of their condition. When patients living with diabetes are knowledgeable on the nutritional management of their condition, it may enable them to achieve optimal health. This ensures the translation of knowledge to action (Murphy, Casey, Dinneen, Lawton, & Brown, 2011).

This model consists of two components, namely, knowledge creation, which is at the centre of the model and action cycle, which surrounds the knowledge creation phase. Knowledge creation, which is represented by an inverted funnel comprises of knowledge inquiry, knowledge synthesis, and knowledge tools or products. The various phases reflect the varied forms of knowledge generation. At the knowledge inquiry phase, which is the beginning of the knowledge creation component, multiple studies on a particular health behaviour are looked at. In this case, at the knowledge inquiry phase, patients living with diabetes can read and acquire knowledge from various randomized controlled trials or studies on the nutritional management of diabetes mellitus. At the knowledge synthesis phase, the number of studies considered is reduced as compared to the previous phase. Therefore, at this phase, patients living with diabetes can narrow their reading by only reading and acquiring knowledge from systematic reviews and meta-analysis studies on the nutritional management of diabetes mellitus. At the knowledge tools or products phase, the number of studies considered is further reduced to a very small number of products or tools to expedite implementation of the knowledge gained. Therefore, at this phase, patients with diabetes can resort to information gained from health care professionals through clinical practice guidelines, teaching aids, and patient decision aids at health care centres or settings for the acquisition of knowledge on the nutritional management of diabetes mellitus. According to this model, knowledge becomes more refined and useful as it moves through the funnel from the knowledge inquiry phase to the

knowledge tools or products phase (Graham et al., 2006). In sum, knowledge creation deals with the means by which patients with diabetes acquire adequate knowledge on a health behaviour, and in this case, healthy eating or proper nutritional management, in order to be in a better position to properly practice or implement it.

The application of knowledge gained falls into the domain of action cycle. According to the model, the action cycle can be influenced by the knowledge creation component. The action cycle consists of seven constructs, all of which can influence one another. The first construct of the action cycle component deals with the identification of a problem, as well as the knowledge required to be able to resolve that problem. Therefore, at this phase, there is assessment of the knowledge acquired to determine its relevance in resolving the problem at hand before it is utilized. In this case, patients living with diabetes need to identify their own problem of poor nutritional management of their condition. After that, they need to assess or evaluate all the knowledge they possess on the nutritional management of diabetes mellitus, including those they acquired at the knowledge creation phase to determine the intervention which is appropriate to curb the nutritional management problem they have identified. The second construct deals with the need for patients with diabetes to adapt the knowledge acquired to suit the local context in which they find themselves. Therefore, if per the knowledge gained from reading various research studies, they realize that a particular source of carbohydrates is for example rare in their country or setting, they have to find suitable alternatives to that particular source of carbohydrates which is common in their setting. This will enable them to easily and smoothly adhere to the intervention they intend to implement. The next construct deals with the ability of patients with diabetes to assess the factors that can promote or hinder the utilization of the knowledge gained in the context in which they find themselves. For instance, patients with diabetes need to consider their background status

such as their socioeconomic status and their cultural backgrounds to determine if it will hinder them from adhering to the intervention they intend to implement or if it will enable them to efficiently and effectively adhere to the intervention they intend to implement. The fourth construct talks about the need for patients with diabetes to use the information gained to determine the type of intervention to select and implement. At this phase, patients with diabetes put together all the considerations factored in the previous phases to select an appropriate intervention or interventions they can easily implement. For the fifth construct, patients living with diabetes have to monitor the implemented intervention to inform them whether to adjust it based on its effectiveness. Here, patients living with diabetes need to monitor themselves on what they eat, how they eat, when they eat, as well as how they are implementing the interventions they have chosen. With the sixth construct, patients with diabetes have to evaluate the impact of the implemented intervention to determine if it has led to improved health outcomes. This is usually done using qualitative and quantitative approaches and it is time-consuming and requires many resources. In this case, patients with diabetes need to use scientific methods and procedures to undertake a scientific research to objectively assess the outcome of the implemented interventions. The last construct of the KTA model deals with the need for patients with diabetes to have a plan in place to sustain the utilization of the knowledge gained in changing environments as time evolves. Achievement of this usually involves human and material resources such as money. In this case, based on the outcome of the preceding phase, patients living with diabetes need to identify how to properly maintain optimal glycaemic control in changing life situations such as socioeconomic changes, changes in family size, and changes in marital status among others.

### **2.1.3 LIMITATIONS OF THE KNOWLEDGE-TO-ACTION FRAMEWORK AND MY REASONS FOR CHOOSING THE INFORMATION-MOTIVATION-BEHAVIOURAL SKILLS MODEL FOR THIS STUDY**

The complex nature of the KTA model which is evident by the absence of well-defined boundaries between the two components that make up the model, as well as the several constructs that make up the model makes it difficult to implement (Graham et al., 2006). Also, at the knowledge inquiry and knowledge synthesis phases of the knowledge creation component, it will be difficult to determine the multiple studies such as randomized controlled trials, systematic reviews, and meta-synthesis which patients living with diabetes may have derived their knowledge from.

Again, patients with diabetes may not have the capacity to be able to identify appropriate alternatives on what they have read and fit them in their local context. In addition, it is more likely that, patients with diabetes may not be able to effectively monitor themselves on the implemented interventions and make adjustments of the interventions where necessary. If the inefficient or lack of proper monitoring of patients living with diabetes by themselves prevents the modification of their interventions where necessary, their health status can deteriorate defeating the purpose of the knowledge acquisition and self-management. Furthermore, it is more likely that patients living with diabetes may not have the capacity to undertake scientific research to evaluate the impact of the implemented intervention. In the case where they have the capacity to evaluate the implemented intervention, the time-consuming nature and the required resources for such a task make it practically impossible for them since it will be a drain on their personal resources. These limitations do not make the KTA model appropriate for this current study.

The IMB model and its constructs clearly explain complex health behaviours, facilitate compliance and adherence among patients with diabetes, and ensures optimum self-management of diabetes mellitus (Deakin, McShane, Cade, & Williams, 2005). Health interventions geared towards effecting health behaviour change goes beyond imparting knowledge to patients, to include motivating the patients to implement such interventions (Osborn & Egede, 2010). In simple terms, to perform a health behaviour such as healthy eating, patients with diabetes require adequate knowledge on proper nutritional management of diabetes mellitus, the motivation to do so despite the difficulties associated with it, and the acquisition of the skills required to undertake the nutritional management of diabetes mellitus. Therefore, with the IMB model, patients' knowledge on diabetes, their motivational factors and competency skills on the nutritional management of diabetes mellitus, which are all crucial to effective self-management of diabetes mellitus can be looked at, making this model appropriate for the study.

In the next section, specific literature has been reviewed based on the organizing framework (IMB model), as well as the objectives of the study.

## **2.2 KNOWLEDGE OF PATIENTS WITH DIABETES ON THE NUTRITIONAL MANAGEMENT OF DIABETES MELLITUS**

Foundational to diabetes care and management is the need for patients with diabetes to make changes in their lifestyles and behaviours on physical activity, nutrition, medication intake, psychosocial issues, problem solving, monitoring of blood glucose levels, and risk reduction (American Diabetes Association, 2018; Beck et al., 2017). However, among these, various research works have cited nutritional management as the cornerstone of diabetes mellitus (Dyson et al., 2011). Optimal nutritional management of diabetes mellitus delays or prevents complications of diabetes mellitus, results in better glycaemic control for patients living with the condition, improves their quality of life, improves their cholesterol levels, and helps them to maintain a healthy body weight (American Diabetes Association, 2018).

Health care workers, particularly, nurses, dietitians, and doctors are considered as the primary educators of patients with diabetes. Hence, one of their core duties is to educate patients living with diabetes on the nutritional management of their condition to enable them achieve optimal health. Nurses, doctors, and dietitians are thus the primary source of knowledge for patients living with diabetes on how to successfully manage their condition and have improved quality of life (Parry Strong, Lyon, Stern, Vavasour, & Milne, 2014; Unadike & Etukumana, 2010; van Zyl & Rheeder, 2008).

The level of knowledge on the nutritional management of diabetes mellitus among patients living with the condition may determine the sort of self-management they engage in (Carney, Stein, & Quinlan, 2013). This is because, the nutritional knowledge level of patients living with diabetes mellitus has a positive correlation with the nutritional management and behaviours they engage in (Rustad & Smith, 2013). Optimum nutritional management of diabetes mellitus by

patients living with the condition is dependent on their knowledge on the sources of carbohydrates, the type of food to eat, the quantity of food to eat, and the effect of food on blood glucose (Beck et al., 2017).

Patients living with diabetes mellitus need to be aware that when they take in foods containing carbohydrates, their digestive system breaks down all the carbohydrates in the food into glucose, which is then absorbed into their bloodstream to increase their blood glucose levels. They also need to be aware that glucose is the main source of energy for the cells and tissues in the body, so they must not avoid carbohydrate-containing foods in their quest to reduce their blood glucose levels. In addition, they must be aware of the need to always eat a balanced diet with the right amount of carbohydrates, proteins, and fats in order to improve their glycaemic control and quality of life (Morris & Wylie-Rosett, 2010; Russell et al., 2016). However, according to the findings of a study conducted among patients living with diabetes mellitus in China, more than 58% of the respondents were scared to either eat at all or eat a lot in order to avoid increasing their blood glucose levels. The study also found that only 30% of the respondents knew the importance of taking in balanced diets (Jing et al., 2016). Another study conducted in Ireland among patients with diabetes showed that, the respondents of the study had a poor knowledge on the effects of carbohydrates, fats, and protein intake on blood glucose levels (Breen, Ryan, Gibney, & O'Shea, 2015).

Relative to carbohydrate sources, patients with diabetes need to take in fruits, vegetables, whole grains, dairy products, and legumes as their sources of carbohydrates and cut down on the taking in of refined carbohydrates (Katz et al., 2014; Nansel, Lipsky, & Liu, 2016). Patients with diabetes need to cut down on the intake of saturated fats and shift to the intake of unsaturated fats for calories (Forouhi et al., 2016; Sacks et al., 2017). Additionally, in order to improve the

glycaemic control of patients with diabetes, health care providers need to properly educate patients with diabetes on the quantity of food to eat, as well as the type of food to eat (Chrvala, Sherr, & Lipman, 2016). Patients living with diabetes can thus be educated to resort to the taking in of the Mediterranean diet as a means to help them put in check the quantity and type of food they eat, the sources of carbohydrates they take, and to ensure that they are engaging in healthy eating to improve their glycaemic levels and their quality of life (Esposito & Giugliano, 2014; Esposito et al., 2015; Georgoulis, Kontogianni, & Yiannakouris, 2014).

A study conducted in 2015 among patients living with diabetes in Uganda revealed that, the level of diabetes dietary knowledge among them was 54% (Ntaate, 2015). In contrast, a study conducted in 2013 among patients with diabetes in China revealed that, the level of diabetes dietary knowledge among the respondents was low (Wang, Song, Ba, Zhu, & Wen, 2013). Also, the findings of a systematic research conducted in 2014 posited that, when patients are knowledgeable on the nutritional management of their condition, they increase their intake of fruits and vegetables, and cut down on their intake of fats and oils. The study further asserted that, patients also increase their intake of fibre, cut down on their intake of sweetened drinks, and resort to the intake of cereals as their source of carbohydrates when they are knowledgeable on the nutritional management of their condition (Spronk, Kullen, Burdon, & O'Connor, 2014). Some of these findings corroborate the findings of another study conducted in 2015 among patients with diabetes in Ghana which indicated that, the participants of the study knew they should avoid all sugar-containing processed foods, as well as avoid adding sugar to the foods they take in so as to avoid increasing their blood glucose levels. The study further found that, the participants were of the view that they need to resort to the intake of fruits and vegetables as their source of carbohydrates, and decrease their intake of starchy foods in order not to increase their blood

glucose levels. They also indicated that they need to decrease their intake of fats and oils, especially saturated fats. The participants were nonetheless confused about the amount of food to take since some of them complained about not feeling satisfied after eating whenever they stick to the recommendations on the required quantity of food to take that has been given them by their health care providers (Doherty, Owusu-Dabo, Kantanka, Brawer, & Plumb, 2014).

### **2.3 THE MOTIVATION OF PATIENTS LIVING WITH DIABETES TO UNDERTAKE THE NUTRITIONAL MANAGEMENT OF THEIR CONDITION**

Research has indicated that about 50% of patients with diabetes are unable to achieve and sustain a glycated haemoglobin level of less than seven percent (7%), which is the recommended value they are supposed to achieve and sustain (American Diabetes Association, 2015). However, proper self-management by people living with diabetes can help them to significantly reduce their glycated haemoglobin levels to optimal levels, delay or prevent complications, achieve optimal glycaemic control, and improve their quality of life (Chrvala et al., 2016; Garber et al., 2013; Norris, Lau, Smith, Schmid, & Engelgau, 2002). Patients with diabetes can successfully engage in self-management when they are well-determined or well-motivated to carry it through (Choi, Song, Chang, & Kim, 2014). Furthermore, research has indicated that educating patients for them to engage in a healthy behaviour without motivating them to do so only yields a success rate of 5% to 10% (Hollis et al., 2014). However, the success rate of patients engaging in a healthy behaviour improves significantly when they are educated and motivated to engage in it (Christie & Channon, 2014). Relative to diabetes mellitus, research has indicated that, there is tremendous improvement in the ability of patients to self-manage their condition when they are educated and motivated to do that (Song, Xu, & Sun, 2014; Welch, Zagarins, Feinberg, & Garb, 2011). It is

therefore not surprising that, the thrust of diabetes self-management education is to equip patients living with the condition with not just knowledge and skills required for proper diabetes self-management, but also the motivation required for proper diabetes self-management (Haas et al., 2013).

Motivation is the driving force that directs the behaviour of individuals and spurs them to achieve set goals or targets, and in this case, health goals or health targets. Motivation is therefore pivotal to achieving the third goal of the sustainable development goals which deals with having or ensuring good health and well-being. This is because, individuals can achieve good health and well-being when they engage in healthy behaviours. However, they can only engage in such behaviours when they are well-motivated to do so (Jooste & Hamani, 2017). The performance of all health behaviours, including healthy eating or nutritional management requires motivation (Choi et al., 2014).

Research has indicated that, patients with diabetes who are well-motivated for diabetes self-management usually have more optimal glycated haemoglobin levels than those who engage in it without being properly motivated. In addition, motivation of patients living with diabetes is statistically significant with their engagement in healthy eating or proper nutritional management of their condition. Therefore, patients with diabetes who are well motivated usually engage in healthy eating or proper nutritional management of their condition (Shigaki et al., 2010). This has been corroborated by the findings of a study which revealed that, patients with diabetes who are educated and motivated to undertake self-management of their condition engage in healthy dietary behaviours (Ekong & Kavookjian, 2016).

In addition, motivating and educating patients living with diabetes mellitus improves their quality of life and well-being (Chen, Creedy, Lin, & Wollin, 2012). Furthermore, a study

conducted among patients living with diabetes mellitus revealed that, when health care professionals add motivation to the education on self-management they render to them, the patients become encouraged and empowered to engage in it. The study further revealed that, patients living with diabetes mellitus see themselves as partners in diabetes care and also feel supported, guided, coached and not dictated to when they are not just educated but motivated to engage in healthy behaviours (Dellasega, Añel-Tiangco, & Gabbay, 2012). This is very critical since patients living with diabetes mellitus are central to successful diabetes self-management and they are the ones who make key decisions everyday on how to manage their condition (Glasgow, Peeples, & Skovlund, 2008; Linmans, van Rossem, Knottnerus, & Spigt, 2015).

Health care professionals can motivate patients with diabetes by assessing their personal values, beliefs, and attitudes to identify internal factors that empower them and make them independent. Health care professionals can then use these motivating and autonomous factors to encourage and drive patients with diabetes, as well as make them determined to take charge of their health by making healthy food choices and decisions everyday to improve their quality of life and well-being. Research has indicated that, patients with diabetes whose personal beliefs, values, and attitudes are used to internally motivate and empower them to engage in self-management are more likely to engage in healthy eating and healthy dietary behaviours (Shigaki et al., 2010). This is because they are able to develop positive attitudes towards self-management of their condition, which also spurs them on to engage in healthy behaviours since the development of positive attitude is a means of ensuring personal motivation (Choi et al., 2014).

Various research works have also highlighted that, patients with diabetes experience improvement in motivation, support, knowledge, skills, abilities, and self-management when there is involvement of significant others to assist them in the care and management of their condition

(Baig, Benitez, Quinn, & Burnet, 2015; Dalton & Matteis, 2014; Hu, Wallace, McCoy, & Amirehsani, 2014). In addition, other research works have cited improvement in the glycaemic control of patients with diabetes as well as their health and quality of life when their social support systems such as family and significant others are tapped into to assist them in the care and management of their condition (Armour, Norris, Jack, Zhang, & Fisher, 2005; Hartmann, Bazner, Wild, Eisler, & Herzog, 2010). Family members and significant others perform varied roles such as the preparation of food, helping in food choices, diet management among others to assist and support patients living with diabetes mellitus. There is therefore the need to include family support as a means to motivate patients with diabetes when educating them in order to help them prevent complications, achieve optimal self-management and improved health outcomes (Wichit, Mnatzaganian, Courtney, Schulz, & Johnson, 2017). Also, a research conducted among patients with diabetes, nurses, and doctors revealed that, social support systems such as diabetes peer support groups, health care professionals, and friends are also critical in ensuring positive health outcomes and well-being for patients with diabetes. Health care professionals therefore need to tap into these systems to assist patients with diabetes to undertake successful self-management of their condition (Goetz et al., 2012). Furthermore, a positive correlation has been established between optimal blood glucose levels of patients with diabetes and the usage of patients' social support systems such as health care professionals, friends, neighbours, family, and significant others (Kadirvelu, Sadasivan, & Ng, 2012).

## **2.4 THE BEHAVIOURAL SKILLS PATIENTS LIVING WITH DIABETES EMPLOY IN THE NUTRITIONAL MANAGEMENT OF THEIR CONDITION**

The focus of diabetes self-management is geared towards lifestyle changes in individuals, particularly on their diet and their engagement in physical activity (Peek, Ferguson, Roberson, & Chin, 2014). According to the American Diabetes Association (ADA), the majority of patients living with diabetes mellitus see the nutritional management of their condition as the most difficult aspect of managing their condition (American Diabetes Association, 2018). However, when patients living with diabetes mellitus have adequate knowledge or education on the skills and abilities needed for the nutritional management of their condition, as well as possess these skills and abilities, they may be more likely to successfully engage in proper nutritional management of their condition (Haas et al., 2013).

Optimal diabetes self-management with regards to diet or nutrition involves the ability of patients living with diabetes to measure carbohydrates, read and use food labels, as well as plan meals (Mulcahy et al., 2003; Ulrich & Abner, 2010). This has been corroborated by research findings of the ADA which have opined the need for patients living with diabetes to use the counting, exchanging, or estimation of carbohydrates to monitor their daily intake of carbohydrates (American Diabetes Association, 2013). This is very significant since there is currently no ideal percentage of proteins, fats, and carbohydrates that patients living with diabetes mellitus are required to take everyday (American Diabetes Association, 2014). Furthermore, a study conducted in Japan among patients living with diabetes revealed that, the percentage of carbohydrates that is taken in is not positively associated with glycaemic control, however, the total intake of carbohydrates is positively associated with glycaemic control (Haimoto, Watanabe, Komeda, & Wakai, 2018).

Carbohydrate counting is a form of meal planning whereby patients living with diabetes mellitus measure the content of carbohydrates in their diet before consumption. Carbohydrate counting gives patients with diabetes the freedom and opportunity to include a variety of foods when planning meals, consume variety of foods, and also gives them flexibility when they are deciding on the food choices to make (Retnakaran & Zinman, 2016). Even though various research works have touted the significance of giving patients living with diabetes the freedom and flexibility to decide on their food choices including their daily carbohydrate intake, the need for them to continue to regulate their carbohydrate intake and eating patterns through carbohydrates counting cannot be overemphasized due to the positive correlation between high carbohydrate intake and poor glycaemic control (Baechle et al., 2018). Health care professionals thus have a responsibility of equipping and supporting patients with diabetes to develop the skill of carbohydrates counting since it is a basic component of diabetes self-management education (Retnakaran & Zinman, 2016). Crucial to carbohydrates counting and a practical means of developing this skill is the need for patients living with diabetes mellitus to accurately read and use food labels in order to determine the nutritional facts of food items and to know the amount of carbohydrates per serving to aid them opt for healthy foods or make better food choices (Hutt & Gonzalez, 2014).

Currently, almost all packaged and processed foods worldwide have food labels. Food labels spell out all the necessary and accurate details or information about food products to consumers (Hutt & Gonzalez, 2014). Food labels contain information about food products including the expiry date, date of manufacture, producers of the product, and name of the product among others. However, key among the information spelt out on food labels are the calories content, as well as the amount of trans fat, unsaturated fat, cholesterol, saturated fat, fibre,

carbohydrates, sodium, proteins, vitamins, and minerals contained in the particular food product (Grunert, Wills, & Fernández-Celemín, 2010; Hutt & Gonzalez, 2014).

Hence, food labels provide patients living with diabetes information on the nutritional value, facts, and properties of food products, and therefore enable them to make sound health decisions and better food choices when buying foods or food products (Han, Kim, Kim, & Kim, 2018). In addition, food labels also give and enhance the freedom of choice of patients with diabetes when they are buying foods or planning meals (Capacci et al., 2012). Furthermore, food label is crucial in the optimal self-management of diabetes mellitus as various research works have indicated that, its use helps prevent the deterioration of the health status of people living with diabetes mellitus (Kim et al., 2016). This has been corroborated by the findings of a research study which was conducted in the United States of America in 2010 which indicated that, patients with diabetes who read food labels take in more fibre, less saturated fat, less sugar, and less carbohydrates (Post, Mainous, Diaz, Matheson, & Everett, 2010).

Despite the enormous benefits associated with the use of food labels, it is usually underutilized by patients (Besler, Buyuktuncer, & Uyar, 2012; Miller & Cassady, 2015). More worryingly, the information spelt out on food labels are usually complex, and therefore makes it difficult for patients and consumers to sometimes make sense out of the numerous and complex information on food packages (Drichoutis, Nayga, & Lazaridis, 2009; Hieke & Taylor, 2012; Wills, Schmidt, Pillo-Blocka, & Cairns, 2009). However, various research works have cited several factors that affect patients' usage of food labels, amongst which include educational level, income level, gender, age among others. That notwithstanding, the nutritional knowledge level of patients or consumers has been identified as key among the factors that affect food label use (Benn, Webb, Chang, & Reidy, 2015; Besler et al., 2012; Grunert, Wills, et al., 2010; Han et al., 2018;

Singla, 2010). Additionally, crucial to the usage of food labels is understanding the nutritional information spelt out on food packages (Grunert, Fernández-Celemín, Wills, Storcksdieck genannt Bonsmann, & Nureeva, 2010). However, the understanding of nutritional information is highly dependent on the nutritional knowledge of consumers or patients that dictates to them the nutrients to avoid, cut down, or increase their intake so as to ensure optimal health (van Trijp, 2009).

Numerous benefits have thus been attributed to nutritional knowledge on the part of consumers and patients. Nutritional knowledge helps patients and consumers to ignore non-essential information on food labels such as marketing features and instead focus on essential information such as nutritional content, value, and quality when buying food products (Miller & Cassady, 2015). Also, nutrition knowledge enables patients and consumers to better understand and make sense of the essential information on food labels, as well as use that information and understanding to make healthful food choices which will in turn lead to optimal health. Nutritional knowledge therefore serves as a major driving force for the understanding and usage of food labels by patients and consumers (Ahmadi, Torkamani, Sohrabi, & Ghahremani, 2013; Campos, Doxey, & Hammond, 2011; Cavaliere, De Marchi, & Banterle, 2017; Wahlich, Gardner, & McGowan, 2013).

The lack of nutritional knowledge as well as the lack of knowledge on the usage of food labels on the part of patients and consumers prevent most of them from making meaning and using the information on food labels (Besler et al., 2012; Liu, Hoefkens, & Verbeke, 2015). It is therefore not surprising a research study carried out in 2014 posited that, the successful usage of food labels is dependent on adequate education of patients on the proper usage of food labels (Cannoosamy, Pugo-Gunsam, & Jeewon, 2014). The findings of another study that was carried out in 2015 among patients living with diabetes in Ireland highlighted that, the participants had very poor knowledge

and skills on the use of food labels. The study further asserted that, the participants who were making use of food labels usually checked the sugar content of food products, followed by the fat content, the sodium content, and the carbohydrate content before opting for a food product (Breen et al., 2015). These findings are similar to the findings of a study conducted in 2008 which posited that, patients living with diabetes are usually interested in checking the sugar content of food products than any other thing when they make use of food labels (Fitzgerald, Damio, Segura-Perez, & Perez-Escamilla, 2008).

Health care professionals thus have a responsibility to render health education on food labels usage to their patients, as well as consider food label reading and usage as a nutrition education tool to increase its usage among patients (Besler et al., 2012; Han et al., 2018). It is very important for health care professionals not to only educate but to also instill in patients with diabetes the skill of food label reading and usage, since it can lead to optimal blood glucose levels and glycaemic levels (Wolfsdorf & Garvey, 2016). However, the findings of a study conducted in 2013 among nurses revealed that, 60% of them did not know where to locate the content of carbohydrates on a food label. This suggests the need for nurses to be properly educated on the optimal nutritional management of diabetes mellitus, especially on the reading of food labels so that they can also equip and educate patients with diabetes for them to engage in food label reading as well as optimal self-management (Carney et al., 2013).

Planning of meals entails taking into consideration the lifestyle, dislikes, and likes of patients living with diabetes and using that information as a guide to help them make daily decisions on the type of food to eat and the quantity of food to eat in order to achieve and sustain optimal blood glucose levels. Meal plans are however individualistic as there is no ideal meal plan that suits all patients living with diabetes mellitus (American Diabetes Association, 2017). In

addition, research works have indicated that, there is currently no specific amount and/or required percentage of fats, proteins, and carbohydrates that patients with diabetes are supposed to consume daily, making the caloric needs of patients with diabetes also individualized. There is currently no specified amount or percentage of nutrients to take because the consequences of the type of carbohydrates and fats consumed daily outweigh the total amount of carbohydrates and fats consumed daily (Crawford, 2017). This was corroborated by a study among patients living with diabetes in Brazil which found that, when two groups of patients living with diabetes consumed the same amount of carbohydrates and fats, the group that consumed quality or healthier carbohydrates which was rich in fibre as well as consumed quality or healthier fats had a better glycaemic control than the other group even though their total carbohydrates and fats intake were the same. This emphasizes the need for patients with diabetes to concentrate on the type or quality of carbohydrates and fats they consume other than the total amount they consume (Aguiar Sarmiento, Peçanha Antonio, Lamas de Miranda, Bellicanta Nicoletto, & Carnevale de Almeida, 2017). Therefore, in meal planning and preparation, it is crucial for patients with diabetes to opt for legumes, fruits, whole grains, and vegetables as their sources of carbohydrates due to their high fibre content and low glycaemic load, as well as opt for unsaturated fats for their sources of fats other than opting for trans fat and saturated fat (Hamdy & Barakatun-Nisak, 2016).

Additionally, various research works have touted the significance of employing the Mediterranean diet in the planning of meals for patients living with diabetes as it guides them on the type of food to eat and the quantity to eat. The Mediterranean diet decreases the blood glucose levels of patients living with diabetes mellitus and significantly decreases their risk of getting cardiovascular conditions (Ajala, English, & Pinkney, 2013; Estruch et al., 2013; Huo et al., 2014). A Mediterranean diet is characterized by high amounts of olive oil, nuts, fruits, cereals, legumes,

whole grains, and vegetables, moderate amounts of fish, poultry, and dairy products, as well as low amounts of red meat and sweets. The concept of Mediterranean diet also espouses the daily consumption of olive oil, nuts, fruits, cereals, legumes, whole grains and vegetables, the consumption of fish and seafood at least twice every week, the consumption of dairy products and poultry a few times every week, the rare consumption of sweet and red meat, as well as the avoidance of trans fat, highly processed foods, processed meat, and refined grains (Boucher, 2017; Levesque, 2017). The findings of a study conducted in 2017 among patients with diabetes posited that, when patients with diabetes consume fruits and vegetables, whole carbohydrates, fish, and dairy products, they have better blood glucose levels, healthier glycated haemoglobin levels, optimal glycaemic control, as well as healthier cholesterol levels. The study further asserted that, when they consume refined carbohydrates, desserts, sweets, and processed foods, they increase their blood glucose levels, glycated haemoglobin levels, as well as their cholesterol levels, worsening their health statuses and conditions (Aguilar Sarmiento et al., 2017).

Meal planning has many benefits, especially for patients living with diabetes mellitus. It leads to the achievement and maintenance of a healthy body weight and optimal glycaemic control, ensures the intake of balanced diet, and prevents under-consumption of essential nutrients. However, the lack of knowledge and skills on meal planning prevents patients living with diabetes from engaging in it (Abbot & Byrd-Bredbenner, 2010). This finding has been corroborated by a study carried out among patients living with diabetes in Canada which posited that, 45% of the participants studied lacked the skills of meal planning (Lee, McKay, & Ardern, 2015). Health care professionals therefore have a responsibility of educating patients with diabetes on meal planning and equipping them with meal planning skills to ensure optimal health (Abbot & Byrd-Bredbenner, 2010). In educating and helping patients with diabetes to plan their meals, health care professionals

have to emphasize the need to avoid skipping meals, avoid excessive intake of snacks in between meals, and stick to the education given them on the reading of food labels, as well as the sources of carbohydrates, fats, and proteins to choose from for optimal health (Ulrich & Abner, 2010). However, research studies conducted in the United States of America and Jordan have highlighted the poor knowledge and deficient skills of nurses on meal planning for patients with diabetes, and therefore clamored for education of nurses on the knowledge and skills of nutritional management of diabetes mellitus, especially on meal planning (Gerard et al., 2010; Yacoub et al., 2014).

## **2.5 SUMMARY CRITIQUE OF THE LITERATURE REVIEW**

Literature search was conducted on the knowledge of patients with diabetes on the nutritional management of diabetes mellitus. The literature search revealed that, in addition to the knowledge of patients with diabetes on the nutritional management of diabetes mellitus, factors that motivate patients with diabetes to engage in the nutritional management of their condition, and the nutritional management skills and abilities patients with diabetes possess are crucial for successful self-management and optimal nutritional management of diabetes mellitus. Additionally, the majority of the research works carried out were done in high-income countries and employed the quantitative research approach. One-hundred and two (102) research works were reviewed under the literature review section of this study. Out of the one-hundred and two (102) studies that were reviewed, ninety-six (96) of the studies were conducted in the western world, that is, Europe, North America, South America, Asia, and Australia, while six (6) of the studies were conducted in sub-Saharan Africa, of which only one (1) of the six studies was conducted in Ghana. This suggests that, there is a gap which needs to be filled on the knowledge of nutritional

management of diabetes mellitus among patients living with diabetes in Ghana, and therefore the need for the current study.

This study therefore employed the qualitative research approach to determine the knowledge of patients with diabetes on the nutritional management of diabetes mellitus, the factors that motivate patients with diabetes to engage in the nutritional management of their condition, and the behavioural skills patients with diabetes employ in the nutritional management of their condition in order to inform policy and improve the quality of life of patients living with diabetes mellitus.

The next chapter deals with the research methods that were used for this study.

## **CHAPTER THREE**

### **RESEARCH METHODS**

This chapter focuses on the varied phases that were followed to complete this study. The chapter comprises of the research design, research setting, target population, sample size and sampling technique, data collection instrument and procedure, methodological rigour, data management, data analysis, as well as the ethical considerations of the study.

#### **3.1 RESEARCH DESIGN**

Research designs are the various forms of inquiry under quantitative research approach and qualitative research approach that determine the overall plan of addressing a research question (Creswell, 2013). Quantitative research approach provides the means for hypothesis testing. It also helps to maintain control, and the data gathered is analyzed using statistical methods. However, qualitative research approach provides the means for exploring, examining, understanding, and describing the behaviour, experiences, perspectives, and feelings of individuals on a phenomenon. Ethnography, phenomenology, historical research, case study, grounded theory, and narrative research are the various forms of qualitative research approach (Creswell, 2013). Exploratory descriptive qualitative studies are carried out when little is known about a phenomenon under investigation or when an in-depth information and insight of a phenomenon is needed (Grove & Gray, 2019). This study specifically employed the exploratory descriptive qualitative research design in order to explore and describe the knowledge of patients living with diabetes mellitus on the nutritional management of their condition. This design was used because, to the best of the researcher's knowledge, there seems to be scanty information on the knowledge of diabetes

mellitus among patients living with the condition in Ghana, especially research studies centred on the nutritional management of the condition. This design therefore enabled the researcher to have one-on-one interaction with patients living with diabetes mellitus by means of interviews, through which their knowledge on the nutritional management of the condition was unearthed.

### **3.2 SETTING OF THE STUDY**

The study was conducted at the National Diabetes Management and Research Centre (NDMRC) of Korle-Bu Teaching Hospital in the Accra Metropolis of the Greater Accra Region of Ghana. This is depicted in the figure below.

**Figure 3.1: The District Map of Greater Accra Region, showing the location of Korle-Bu Teaching Hospital and its environs.**



Korle-Bu Teaching Hospital, established on 9<sup>th</sup> October, 1923, is the leading referral hospital in the country and among the three largest hospitals in Africa. It was initially established

as a two hundred bed capacity general hospital during the reign of one of the Governors of the Gold Coast known as Sir Gordon Guggisberg. The increasing demand for the services of the hospital compelled the government to expand the hospital by constructing new blocks or structures in 1953, which increased the bed capacity of the hospital to one thousand, two hundred. When the Medical School of University of Ghana was established for the training of medical doctors in 1962, the hospital gained a teaching hospital status.

Currently, the hospital has a two thousand bed capacity, an average daily attendance of one thousand, five hundred, and an average patient admission of about two hundred and fifty everyday. The hospital also has seventeen diagnostic and clinical departments, which include obstetrics and gynaecology, child health, medicine, radiology, surgical/medical emergency, anaesthesia, pathology, surgery, pharmacy, accident centre, surgical/medical emergency pharmacy, polyclinic, finance, engineering, laboratories, and general administration. Additionally, the hospital has varied specialty areas and provides services in complex scientific investigative procedures.

The hospital currently serves the Greater Accra Region, which has a population of about five million people, its surrounding environs, and also receives referral cases from all over the country. In addition, people from neighbouring countries such as Togo, Burkina Faso, and Nigeria also patronize the services of the hospital.

The NDMRC is a well-equipped centre for diabetes management, research, and education, managed by highly qualified medical and paramedical staff. The centre provides all the pertinent services and support key to proper diabetes care and management including nutrition, medication intake, exercise, psychosocial issues, and blood glucose monitoring. The centre has a diabetic clinic which serves as the outpatient department and provides medical care to patients with diabetes. Patients with diabetes who need to be hospitalized are then admitted at the medical unit.

The NDMRC of the Korle-Bu Teaching Hospital was selected as the study site due to the high patronage of its services by patients living with diabetes mellitus, as well as the centre being the main referral point for all diabetes cases which need serious medical attention.

### **3.3 TARGET POPULATION**

The target population for the study included all patients living with diabetes mellitus who attend clinic at the Korle-Bu Teaching Hospital.

### **3.4 INCLUSION CRITERIA**

The inclusion criteria included all patients living with type 1 or type 2 diabetes mellitus who were attending clinic at the NDMRC of the Korle-Bu Teaching Hospital, who were eighteen years and above, and who had been diagnosed of diabetes mellitus for at least six months.

### **3.5 EXCLUSION CRITERIA**

The study excluded all patients living with type 1 or type 2 diabetes mellitus who were seriously ill, who were less than eighteen years of age and had been diagnosed of the condition for less than six months, and patients who did not consent to participate in the study.

### **3.6 SAMPLE SIZE AND SAMPLING TECHNIQUE**

A sample is a subset of a population that is recruited for a research. Sampling refers to the selection of a part of a population for observation in a study so that an estimate can be made about

the entire population (Thompson, 2012). There are two major types of sampling, namely, probability sampling and non-probability sampling. Probability sampling techniques comprise of simple random sampling, systematic random sampling, cluster sampling, and stratified random sampling. Non-probability sampling techniques consist of purposive sampling, quota sampling, convenience sampling, and snowball sampling (Khan, 2012).

Purposive sampling was employed to recruit the participants for this study. Purposive sampling is a non-probability sampling technique in which a researcher relies on his or her judgment about a population to draw a sample that has characteristics required for the study from the population. With this sampling technique, all the members of a population do not have an equal chance of being selected to be part of a sample. The researcher used purposive sampling because he was only interested in patients living with diabetes mellitus who were ready to give relevant information on their knowledge on the nutritional management of diabetes mellitus (Khan, 2012). Therefore, only participants who met the inclusion criteria were selected for the study. In selecting the sample, the researcher first sought permission from the hospital's Institutional Review Board and then the head of the NDMRC of Korle-Bu Teaching Hospital. Afterwards, the researcher verbally informed patients with diabetes who attend clinic at the NDMRC of Korle-Bu Teaching Hospital about the study, and the requirements for participating in it. Patients with diabetes who met the inclusion criteria, agreed and consented to be part of the study were recruited and interviewed.

Generally, the sample size of a qualitative research depends on the saturation of data, that is, the giving of similar responses by successive participants, and the emergence of no new theme or sub-themes (Mason, 2010). This study comprised of fifteen participants. This is because

saturation of data was reached by the fifteenth participant. The researcher used twenty-nine (29) days to recruit and interview the fifteen participants for the current study.

### **3.7 PILOTING OF INSTRUMENT**

Piloting of research instrument enables researchers to know and understand the difficulty participants have in understanding and answering the questions they pose to them. Piloting of research instrument therefore helps to modify the research instrument where necessary, before it is administered to the study participants in order to elicit the right responses from them (Resnick, 2015). The researcher piloted the research instrument at the University of Ghana Hospital at Legon, since this hospital has the same caliber of patients with diabetes as Korle-Bu Teaching Hospital, which was used as the study setting. The researcher used the interview guide to interview three patients with diabetes who met the inclusion criteria for this study and also willingly agreed and consented to be part of the study. The data gathered was transcribed to help the researcher refine the interview guide. Data that emerged from the piloting of the research instrument was not included in the final study.

### **3.8 DATA COLLECTION TOOL**

Interview is a means of acquiring knowledge and collecting data from participants, in which a researcher or an interviewer engages interviewees in a conversation, coordinates the conversation, and asks questions which are responded to by the interviewees. There are three types of interview, namely, structured, unstructured, and semi-structured (Qu & Dumay, 2011).

A semi-structured interview was used to collect data from the participants. A semi-structured interview is a type of interview in which an interviewer is guided by a script or a set of questions to ensure all the interviewees provide information on the same topics but the interviewer can explore interesting issues in-depth based on the answers by the interviewees (Qu & Dumay, 2011). Therefore, in conducting the interview, a semi-structured interview guide (Appendix H) was used to explore the knowledge of nutritional management of diabetes mellitus among patients with the condition. The semi-structured interview guide was developed guided by the Information-Motivation-Behavioural Skills model which defined the research objectives for this study. The interview guide was divided into two sections or two parts, of which the first part comprised of participants' socio-demographic information, and the second part comprised of open-ended questions on participants' knowledge on the nutritional management of diabetes mellitus as well as probes based on their responses.

### **3.9 DATA COLLECTION PROCEDURE**

An introductory letter from the School of Nursing and Midwifery (Appendix A) and a research proposal for this study was sent to the Noguchi Memorial Institute for Medical Research Institutional Review Board (NMIMR – IRB) for approval. The NMIMR – IRB reviewed and approved this study (Appendix C). Another introductory letter from the School of Nursing and Midwifery (Appendix B) and a research proposal was also sent to the Korle-Bu Teaching Hospital Institutional Review Board (KBTH – IRB) for approval. After reviewing the study, the Scientific and Technical Committee of the Korle-Bu Teaching Hospital granted a scientific and technical approval for the study (Appendix E), after which the KBTH – IRB finally gave an ethical clearance for the study to be conducted (Appendix F). An approval letter from the Medical Directorate of

the hospital to the head of the NDMRC (Appendix G) was then sent for recruitment of participants for the study and the collection of data. With the assistance of the nurse manager and nurses at the diabetic clinic of the NDMRC, and guided by the inclusion and exclusion criteria, the researcher recruited participants for face-to-face interviews after explaining the details of the study to the participants.

Before an interview was conducted, the researcher established rapport with each participant to gain his or her cooperation and to enable him or her to be at ease and to be able to freely share his or her knowledge and experiences on the nutritional management of diabetes mellitus. After establishing the rapport, the researcher then gave each participant a consent form (Appendix D) to read, ask questions and seek clarifications based on the content of the consent form and the study. Each participant then willingly signed or thumbprinted the consent form after he or she had clarified all doubts and was very satisfied with the content of what he or she had read and the answers he or she had received before the interview was conducted. For participants who could not read, the information was translated to them in the local “Twi” language which they understand.

The interviews were conducted at a convenient place at the diabetic clinic which ensured that privacy was provided. The time for each interview was selected based on the convenience of each participant. The interviews were conducted in either English language or the local “Twi” language, depending on the dialect a participant was comfortable with. With the permission of the participants, each interview was recorded with an audio recorder, and had a time duration of forty (40) minutes to sixty (60) minutes. The researcher also used a field diary to record information on his thoughts, emotions, and biases, as well as participants’ gestures and non-verbal communication

during the interview. These field notes were useful in augmenting the interview data and aided with analysis of the data.

### **3.10 DATA MANAGEMENT**

The interviews that were conducted in the English language were transcribed verbatim, while the interviews that were conducted in the local “Twi” language were translated and transcribed verbatim into English language by the researcher with the help of a translator to avoid distorting the data. To ensure anonymity, the researcher gave the participants pseudonyms. On the researcher’s password-protected laptop, a folder was created for the response of each participant which contained the participant’s transcribed interview and the researcher’s field notes on the participant. Also, the audio recordings, field notes, interview transcripts, as well as the participants’ consent forms have been stored under lock and key in a safe cabinet at the researcher’s personal office. In addition, to guard against the loss of the raw data, the data was stored on a password-protected pen drive. The secured data will however be stored for five years, after which it will be discarded or destroyed (Lin, 2009).

### **3.11 DATA ANALYSIS**

Key to qualitative analysis is thematic content analysis. Thematic content analysis is a qualitative analysis method used to identify, analyze, and report patterns in collected data. Thematic analysis helps in the organization and detailed description of data, as well as helps in the interpretation of gathered data (Braun & Clarke, 2006). Data analysis was done alongside data collection using thematic content analysis. The data collected was analyzed using Braun and

Clarke (2006) method of data analysis. According to Braun and Clarke (2006), thematic content analysis comprises of six stages. Hence, the six stages of thematic analysis that the data gathered was taken through included “familiarization with the data, generation of initial codes, searching for themes, reviewing of themes, definition and naming of themes, and production of report” (Braun & Clarke, 2006).

The audio recorded interviews that were conducted in English language were first transcribed verbatim. Those that were conducted in the local “Twi” language were translated and transcribed verbatim into English language by the researcher with the help of a translator to avoid distorting the data. The transcripts of the interviews were then read and re-read. The researcher then noted the initial ideas as well as the interesting ideas that emerged from the data. Afterwards, the initial ideas and interesting ideas were coded to generate the initial codes. Extracts from the data were then matched to the relevant codes. The various codes were subsequently collated into potential themes, after which all extracts from the data were also collated to match with the relevant themes. After that, the various themes were reviewed to find out if some of them could be merged, broken down or eliminated depending on the amount of data supporting them. Additionally, the data extracts under each theme were also read and re-read to determine whether they form a coherent pattern. Afterwards, a detailed analysis of each theme was conducted and the coherent pattern of the analysis of each theme was also looked at, as well as how each theme helps answer the research questions. Then, the themes were refined and defined appropriately to accurately capture their scope and content. Afterwards, the researcher discussed his conclusions on the codes and themes with his supervisors to ensure they accurately reflect the responses of the participants from the data gathered. Then, a final analysis of the themes was done to come up with a research report which provides accurate answers to the research questions.

### **3.12 METHODOLOGICAL RIGOUR**

The importance of rigour in qualitative research cannot be overemphasized because of its greater worth and trustworthiness in ensuring that, the responses and experiences of participants are accurately reported in a qualitative study. It also ensures that the conclusions of researchers are the correct representation of participants' responses in a qualitative study (Burns & Grove, 2011). There are varied methods for ensuring rigour or trustworthiness in qualitative research. However, the most commonly used one is that posited by Lincoln and Guba in 1985 (Houghton, Casey, Shaw, & Murphy, 2013). Therefore, the main criteria for ensuring rigour or trustworthiness in this study comprised of credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985).

Credibility refers to the accuracy and believability of research findings (Polit & Beck, 2006). Credibility therefore brings to light the correctness and representativeness of research findings from the data gathered from study participants (Anney, 2014). Credibility in qualitative research can be ensured through member checking and peer debriefing (Houghton et al., 2013).

In ensuring credibility, purposive sampling was employed to recruit the right participants for this study who were patients living with diabetes mellitus who attend clinic at the NDMRC of the Korle-Bu Teaching Hospital, who were at least eighteen years of age, and who had been diagnosed of the condition for at least six months to explore their knowledge on the nutritional management of diabetes mellitus. This ensured that an accurate picture of the phenomenon under study was presented. Also, member checking was ensured by verifying from the study participants if their transcribed responses corresponded with what they presented before conclusions were drawn by the researcher. In addition, member checking was also done during data analysis and interpretation by consulting participants and using accurate views of the study participants to

eliminate any bias on the part of the researcher. In order to use peer debriefing, the first three transcribed interviews were coded separately by the researcher and one of his course mates. The researcher then reviewed his coding by comparing it to that of his course mate and made the necessary changes.

Transferability refers to the extent to which the findings of a qualitative study can be transferred to another context with other respondents (Anney, 2014). To ensure transferability, the original context of qualitative research work must be adequately described so that readers and consumers of the research can make the correct judgment on how the research findings are applicable to specific contexts (Houghton et al., 2013).

Transferability was therefore ensured by outlining a clear and vivid description of the study setting which is the NDMRC of the Korle-Bu Teaching Hospital, the characteristics of the participants that were recruited, as well as the research methods that were used. Additionally, examples of the raw data were also included in the study by clearly stating some of the participants' direct quotes.

Dependability refers to the replicability of research findings in the same or similar context with the same or similar participants when the same method is utilized (Shenton, 2004). Dependability therefore ensures that over time and during varied conditions, the data gathered is stable (Polit & Beck, 2006). Dependability in qualitative research can be achieved via audit trail and the code-recode strategy (Anney, 2014).

Audit trail was carried out by outlining a detailed report of the processes within the study. This was achieved by the researcher clearly stating the research design that was used for the study, and how it was implemented. Additionally, how the data was collected, recorded, and analyzed were also clearly spelt out as part of the audit trail. Also, in order to implement the code-recode

strategy, the researcher coded the data two times by interspersing the first coding session and the second coding session by a one-week time duration. Afterwards, the researcher compared the results of the two coding sets and made the necessary changes.

Confirmability refers to the extent to which the findings of a research can be corroborated by other researchers. Confirmability therefore gives credence to the information provided by participants by ensuring that, interpretations of the data are not invented by the researcher or influenced by the researcher's knowledge, biases, and experiences, but they are a reflection of the voice of the participants, and the conditions of the research. One way to ensure confirmability in qualitative research is through audit trail (Anney, 2014; Polit & Beck, 2006).

To ensure confirmability, the researcher presented the findings that were clearly derived from the data, that is, the reflection of the knowledge of patients living with diabetes mellitus on the nutritional management of their condition. To ensure this, the researcher recorded the responses of the study participants with an audio recorder and transcribed it verbatim. Afterwards, themes and sub-themes were derived from the data and supported with quotes from the participants. In addition, to ensure audit trail, a detailed report of the processes within the study was presented. This was achieved by the researcher clearly stating the research design that was used for the study, and how it was implemented. Additionally, how the data was collected, recorded, and analyzed were also clearly spelt out as part of the audit trail.

### **3.13 ETHICAL CONSIDERATIONS**

Ethical clearance was sought from the NMIMR – IRB at University of Ghana, as well as the KBTH – IRB before the study was carried out. Afterwards, permission was then sought from

the head of the NDMRC of Korle-Bu Teaching Hospital in order to recruit participants for the study. The purpose of the study was explained to the participants, and their consent was sought for before they were recruited and interviewed. The participants were informed that they will not derive any direct benefits from the study, however, the findings of the study may inform the provision of new guidelines and protocols on diabetes mellitus and the incorporation of other information on diabetes mellitus into the nursing curriculum for purposes of nursing education. Also, they were informed that the interviews will not cause any harm to them and their associates. All the participants were treated the same regardless of their beliefs and sentiments. In addition, participants who willingly consented to be part of the study were given a consent form to read and sign or thumbprint after they had understood the contents of the consent form and the study. The participants were interviewed after signing or thumbprinting the consent form. The participants were also assured of confidentiality and anonymity, and were informed that they have the right to opt out of the study at any time during the research without any consequences. The researcher also informed the participants that, their decision to withdraw from the study or not to take part in the study at all will not affect their treatment at the hospital. Furthermore, the researcher ensured privacy when conducting the interviews. Also, the audio recordings and field notes have been kept under lock and key in a safe cabinet at the researcher's personal office, and only the researcher and his research supervisors will have access to the raw data. Again, the data that was presented in the findings was anonymized by using pseudonyms for participants to avoid giving any identifiable information about them. However, after keeping the data and field notes for five years, they will be properly discarded or destroyed (Lin, 2009).

## **CHAPTER FOUR**

### **FINDINGS**

This chapter focuses on the responses that were generated from the participants who took part in this study. This study sought to explore the knowledge on nutritional management of diabetes mellitus among patients with diabetes who attend clinic at the Korle-Bu Teaching Hospital, Accra. The specific objectives of the study were to: explore the knowledge of patients living with diabetes on the nutritional management of the condition; identify the factors that motivate patients living with diabetes mellitus to undertake nutritional management of their condition; and ascertain the behavioural skills patients living with diabetes mellitus employ in the nutritional management of their condition. This chapter has been divided into two sections. The first section concentrated on the socio-demographic characteristics of the participants who were interviewed for this study while the second section focused on the organization of the themes and sub-themes that emerged from the data gathered.

#### **4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS**

The number of participants who were recruited and interviewed for this study was fifteen. Out of the fifteen participants, eight were females and seven were males. They were all Ghanaians and Christians. Their ages ranged from 42 years to 86 years, while the number of years they have been diagnosed with diabetes ranged from 2 years to 30 years. Also, ten of them were married while five of them were bereaved. On the ethnicity of the fifteen participants, nine were Akans, four were Ga-Adangbes, and two were Ewes. Out of the nine Akans, six mentioned that they were Ashantis, two were from Akyem, and one was a Fante. For the four participants who were Ga-Adangbes, three were Gas, and one was an Adangbe. Five of the participants spoke in the

English Language while ten of them spoke in the local “Twi” Language. The details of the participants with their pseudonyms have been presented in the table below (Table 4.1).

**Table 4.1: Socio-demographic Characteristics of Participants**

NAME	AGE	LEVEL OF EDUCATION	GENDER	DURATION OF DIAGNOSIS	OCCUPATION	MARITAL STATUS
Kwadwo	58	SHS	Male	6 years	Electrician	Married
Kwabena	86	JHS	Male	23 years	Pensioner	Widower
Adwoa	60	JHS	Female	14 years	Trader	Married
Akwasi	42	JHS	Male	6 years	Welder	Married
Abena	47	Primary	Female	10 years	Trader	Married
Yaa	60	SHS	Female	14 years	Food Vendor	Married
Akua	78	Primary	Female	28 years	Trader	Widow
Kwame	53	JHS	Male	18 years	Trader	Married
Kwaku	63	SHS	Male	25 years	Driver	Widower
Yaw	66	SHS	Male	19 years	Pensioner	Married
Kofi	76	Tertiary	Male	25 years	Pensioner	Married
Ama	69	Tertiary	Female	10 years	Pensioner	Widow
Dede	68	JHS	Female	30 years	Unemployed	Widow
Afia	58	SHS	Female	2 years	Trader	Married
Akosua	52	JHS	Female	16 years	Trader	Married

#### **4.2 ORGANIZATION OF THEMES AND SUB-THEMES**

In all, five main themes and nineteen sub-themes emerged from the data gathered. Using thematic content analysis, four themes and fourteen sub-themes emerged in conformity with the research objectives for this study, which are based on the constructs of the Information-Motivation-Behavioural Skills model which served as the conceptual framework for the study (Braun & Clarke, 2006). One theme with five sub-themes also emerged from the data gathered from participants using content analysis (Crowe, Inder, & Porter, 2015). All the themes and sub-themes have been presented with verbatim exemplars from the participants who have been given pseudonyms. The themes and sub-themes have been presented in the table (Table 4.2) at the next page.

**Table 4.2: Themes and Sub-themes**

<b>THEMES</b>	<b>SUB-THEMES</b>
<b>Knowledge on nutritional management of diabetes</b>	<ol style="list-style-type: none"> <li>1. Lifestyle before diagnosis (Ignorance of repercussions of poor lifestyle before diagnosis)</li> <li>2. Knowledge on foods to take and avoid</li> <li>3. Knowledge on healthy eating habits</li> <li>4. Source of knowledge on diabetes management</li> </ol>
<b>Motivation to undertake nutritional management of diabetes</b>	<ol style="list-style-type: none"> <li>1. Intrinsic Motivation               <ol style="list-style-type: none"> <li>a. Long life</li> <li>b. Good health</li> <li>c. Prevent worsening of condition</li> <li>d. Prove that diabetes can be cured</li> </ol> </li> <li>2. Extrinsic Motivation               <ol style="list-style-type: none"> <li>a. To be able to take proper care of their children</li> <li>b. Reliance on God</li> </ol> </li> </ol>
<b>Support systems relied on in the care and management of diabetes</b>	<ol style="list-style-type: none"> <li>1. Medical support</li> <li>2. Support from family</li> <li>3. Spiritual support</li> <li>4. Support from friends</li> <li>5. Diabetes peer support groups</li> </ol>
<b>Skills/Practices on nutritional management of diabetes</b>	<ol style="list-style-type: none"> <li>1. Dietary practices in the morning, afternoon, and evening</li> <li>2. Reading of food labels</li> <li>3. Meal planning</li> </ol>
<b>Challenges to adherence of optimal nutritional management of diabetes</b>	<ol style="list-style-type: none"> <li>1. Financial constraints</li> <li>2. Non-availability of preferred foods</li> <li>3. Loss of appetite</li> <li>4. Job demands</li> <li>5. Appetite/Desire for foods to avoid</li> </ol>

#### **4.3 KNOWLEDGE ON NUTRITIONAL MANAGEMENT OF DIABETES**

All the participants (15) knew that diabetes mellitus is a condition that causes one's sugar level to rise beyond the expected or normal range. All of them shared their knowledge with the researcher based on the education received from doctors, dietitians, and nurses at the Korle-Bu Teaching Hospital on what the condition is, as well as how to manage it nutritionally by increasing the intake of certain foods, avoiding the intake of certain foods, and cutting down on the intake of some food items. They also echoed the education given them on the need to put the quantity of foods they eat in check, and to avoid late night eating and starvation. Most of the participants mentioned that they have been educated to increase their intake of fruits, fibre-rich diets, and vegetables, and decrease their intake of starchy foods, especially cassava. The participants however had different views on the intake of some food items. Whiles some said they have been asked to avoid certain foods, others indicated that they have been asked to decrease their intake of such foods or take them but in smaller quantities. However, participants generally had knowledge on the condition and how to manage it nutritionally. The responses generated from participants were subdivided into four areas which included the following: lifestyle before diagnosis, knowledge on foods to take and avoid, knowledge on healthy eating habits, and source of knowledge on diabetes management.

##### **4.3.1. LIFESTYLE BEFORE DIAGNOSIS (IGNORANCE OF REPERCUSSIONS OF POOR LIFESTYLE BEFORE DIAGNOSIS)**

The participants talked about their lifestyle prior to being diagnosed with diabetes mellitus. They emphasized on their eating habits prior to their diagnoses. From their responses, they were ignorant of the repercussions of the eating habits they were engaging in before diagnosis.

The majority of the participants (10) said that they were not mindful of the types of food they were eating prior to diagnosis, and the times they were eating their food. One of them recounted:

*“Initially, I used to eat everything and anyhow. Anytime I felt like eating a particular food, I will go in for it.” (Kwabena, 86 years).*

In the same way, one of the participants noted that she was not aware of the effects of diabetes and was therefore not careful about her choice of food. She commented:

*“For me, I didn’t know anything, so I was eating everything or every food.” (Akosua, 52 years).*

It appeared the participants were not cautious about what they were eating, and the times they were eating prior to diagnosis because they were not aware of the consequences of their actions. Their poor eating habits or unhealthy lifestyles may have contributed to acquiring diabetes mellitus.

Also, most of the participants (8) used to take soft drinks, sugar, and sugary foods before they got the condition. One female participant remarked:

*“Initially, by now I would have taken about six or seven bottles of Coke for the few minutes we’ve sat down for this conversation. Some time ago, I also used to add a lot of sugar to my tea such that when I’m even done taking the tea, the residue in the cup was even too sugary, testifying to the amount of sugar I added to it but I have changed now.” (Yaa, 60 years).*

Similarly, Kwaku commented:

*“What I used to take much then was soft drinks. If someone was taking soft drinks more than me, then it means the person was working in a brewery. I used to take soft drinks like water. Even if I was feeling thirsty I will rather take a soft drink instead of water. And I was also taking a lot of sweet things like biscuit, those saturated with sugar, I used to take them a lot.” (Kwaku, 63 years).*

It was obvious from the accounts of the participants that, they were excessively consuming soft drinks and sugary products prior to their diagnosis.

On the other hand, one-third of the participants (5) admitted to consuming alcohol moderately or excessively before they were diagnosed with diabetes. One of them opined:

*“You see, I drink a lot. And when you drink a lot, you will be framed in a certain way. Everybody sees you and easily identifies you as someone who drinks a lot. That’s what alcohol did to me.” (Kwadwo, 58 years).*

Another participant recounted:

*“I am someone that used to take alcohol, but it wasn’t serious or excessive in those days. Some people take alcohol occasionally, I am that type. I was taking alcohol occasionally, but I wasn’t taking it frequently.” (Kwame, 53 years).*

Some of the participants were consuming alcohol either excessively or in moderation prior to their diagnosis. Those who were consuming it in moderation used to take it occasionally while those who were consuming it excessively used to take it regularly.

Apart from the habits or behaviours indicated above, few of the participants (4) also opined that before they got the condition, they used to eat late in the night. They added that they were even eating heavy meals late in the night because they got home from work late. One of them recounted:

*“I don’t close from work early. Sometimes I get home as late as 11pm or 12 midnight. And when I get home, I eat the food available. Sometimes I eat fufu around that time and other heavy foods. I didn’t know about it, I was ignorant of what I was doing and its consequences.” (Akwasi, 42 years).*

It was obvious the participants who engaged in late eating were not knowledgeable on the health implications of their behaviour.

#### **4.3.2 KNOWLEDGE ON FOODS TO TAKE AND AVOID**

Under this sub-theme, the participants shared their views on a variety of foods their health care providers have advised them to increase its intake, decrease its intake, and avoid eating because of their condition.

The participants mentioned a variety of foods they have been asked to consume in increased amounts. The majority of them (8) said that they have been educated to take in more fruits. Banana

was the common fruit they indicated that they have been asked to increase its intake. Some of them opined:

*“For fruits they said I should take a lot. They mentioned apple and banana that I can take them, and I should take a fruit regularly.” (Yaw, 66 years).*

*“He also asked me to take fruits like banana in the morning around 10am. He said I should eat a fruit everyday.” (Kwabena, 86 years).*

From the narratives of the participants, they were aware of the need to consume fruits regularly due to the health education they were given by their health care providers.

However, two participants mentioned that, even though the health care workers have told them to increase their intake of fruits, they have also asked them to avoid taking sugar cane because of its high sugar content. One of them remarked:

*“The only fruit that they have advised us against is sugar cane. They said we shouldn’t take sugar cane because it has a lot of sugar in it, that’s what I know. Apart from that one, they said we should take everything.” (Kofi, 76 years).*

In addition, a female participant said she has also been asked to avoid consuming ripe pawpaw.

Below is her narration:

*“For fruits, they have taught us that, we can take pawpaw but we are not supposed to take in ripe pawpaw. He said we should rather take the not so ripe ones.” (Akosua, 52 years).*

Some of the participants were simply told to avoid certain fruits that contain more sugar or that are very sweet to taste other than being educated to take them in moderation.

Three female participants said they were educated by the health care workers not to consume pineapple, while three other participants said they were told to decrease their intake of pineapple and not to avoid eating it. Some of their responses are as follows:

*“The fruit I like best is pineapple, but I’m unable to eat it these days because I’ve been told it contains sugar, natural sugar, so I should avoid taking it.” (Yaa, 60 years).*

*“They told me to take pineapple, but they also said that too much of it is not good for diabetics, so I should take it once in a while.” (Kwadwo, 58 years).*

The content of the health education that was given to the participants was inconsistent, and this accounted for the differing views of the participants on the intake of pineapple.

Regarding the intake of fruits, one female participant said she was told to cut down on her intake of pear, while another said she was told to cut down on her intake of apple by the health care workers.

*“So what I like is pear, but they have told me to limit my intake of pear, so I don’t eat it frequently.” (Akua, 78 years).*

*“They also told us to take lots of fruits, but for apple he told us to avoid too much intake of it because it is too sweet.” (Dede, 68 years).*

The health care providers considered the sweet nature of fruits in their health education to the patients, in order to help them keep their blood glucose levels in check.

On the other hand, almost half of the participants (7) indicated that they have been asked to increase their intake of foods rich in fibre. One of them remarked:

*“I have been educated to take more of foods rich in fibre such as oats, porridge, and wheat.” (Akwasi, 42 years).*

The health care providers have adequate knowledge on the need for patients with diabetes to consume increased amounts of fibre-rich diets, and therefore educated the patients accordingly.

For six of the participants, they mentioned that they have been educated to add vegetables to their food, as well as take more stew and soup when eating. One female participant opined:

*“The dietitian told me to eat a lot of vegetables. He again told me to take a lot of soup regularly, add more stew to my food, and take all the stew I add to the food.” (Abena, 47 years).*

Ghanaian stews and soups are largely prepared with vegetables. Hence, by asking the participants to take in more soup and stew when eating, the health care providers appeared to have found another way of helping the participants consume increased amounts of vegetables.

Similarly, four of the participants mentioned brown rice and the local Ghanaian rice as some of the foods they have been asked to eat more of. One of them commented:

*“For rice, they have told us to take more of the local one. They said it is good for us. They also said brown rice too is good for us.” (Kwadwo, 58 years).*

The fibre content or the unrefined nature of the local Ghanaian rice and the brown rice may have been the reason why the health care workers gave this education to the participants.

Eight of the participants echoed the need to add protein sources to their diet. They mentioned fish, chicken, and beans as some of the protein foods they have been told to consume or add to their diet. Some of their responses are as follows:

*“Foods containing protein are also good for us. They said we should often take fish. And for fish, they advised us to go in for dry fish.” (Adwoa, 60 years).*

*“They also asked us to take chicken. They said it is good for us.” (Akua, 78 years).*

*“They told me beans too is very good because of the protein content.” (Kwaku, 63 years).*

From the narratives of the participants, it appeared that they were knowledgeable on the need to add protein to their diet, as well as the healthy protein sources they were supposed to take.

Furthermore, five of them said they were educated to totally refrain from eating meat because of their condition, while three of them indicated that they were told to limit their intake of meat or avoid excessive meat consumption. Some of their responses were as follows:

*“I was told to avoid meat eating because it is not good for me.” (Afia, 58 years).*

*“He also told us to avoid too much meat eating. He said if we have to take meat, we should take meat whose size is like two boxes of matches in the morning or afternoon or evening, and we shouldn’t go beyond that.” (Kwabena, 86 years).*

It seemed that the participants were aware of the need to avoid regular and excessive consumption of meat due to their condition. The health care workers ought to have been consistent in their health education by insisting on rare consumption of meat other than avoiding meat consumption.

Also, according to three participants, they were told by the health care workers to take only Carnation Milk and avoid taking any other type of milk. One of them narrated:

*“Initially, I used to take a lot of milk but they advised me to stop. And they said if I take milk, it’s the Carnation Milk that I should take.” (Dede, 68 years).*

Carnation Milk is a Ghanaian product which is cholesterol-free. The health care workers may have insisted on Carnation Milk in order to help the participants keep their cholesterol levels in check.

Additionally, the participants of this study also mentioned a variety of foods they have been told to refrain from eating or decrease its intake. From their accounts, six participants were told to avoid sugar and sugary foods. Some of them added that they were told to go in for non-nutritive sweeteners other than the white sugar or local sugar. Below were some of their responses:

*“He told us to avoid taking white sugar, the local one. He didn’t say we should decrease its intake, he said we should stop taking it, that’s the white sugar. The only sugar he said we can take is the diabetes sugar.” (Adwoa, 60 years).*

*“I don’t eat sugary foods. The dietitian told me not to eat sugary things like cake, sweet things, and anything looking sugary.” (Yaw, 66 years).*

The participants knew they need to avoid sugars or refined sugars other than consume them rarely.

However, they were aware they need to consume non-nutritive sweeteners often.

Furthermore, few of the participants (4) also echoed that they were told to avoid eating foods prepared with cassava. One of them remarked:

*“Oh for the dietitian, he taught me how to eat. The only foods he told me to avoid are cassava foods or raw cassava.” (Kwame, 53 years).*

On the other hand, most of the participants (8) said they were educated to cut down on their intake of cassava because of its starch content. One of them recounted:

*“He said cassava is a starchy food, so I should not take much. I shouldn’t take it in large quantities like someone who is not a diabetic.” (Abena, 47 years).*

The majority of the participants were knowledgeable on the need to either avoid or decrease their intake of starchy foods, particularly cassava in order to avoid raising their blood glucose levels.

Also, eight of the participants were of the view that people living with diabetes should decrease their intake of foods that contain fats and oils. Below are some of their responses:

*“For our oil intake, it should be minimized.” (Kofi, 76 years).*

*“We need to decrease our intake of fatty foods.” (Akosua, 52 years).*

The participants appeared to be knowledgeable on the need to cut down on their intake of fats and oil in general.

While three participants said they were told by the health care workers to decrease their intake of yam, one female participant said she was asked to avoid consuming yam. Some of their responses can be found below:

*“If it is boiled yam that I want to take, I’m not supposed to take more than four slices of yam per the education that was given to me.” (Akwasi, 42 years).*

*“They said I should avoid eating yam.” (Dede, 68 years).*

It seemed the participants were told to decrease or avoid eating yam because of its starch content, since starchy foods have a higher chance of increasing blood glucose levels.

#### 4.3.3 KNOWLEDGE ON HEALTHY EATING HABITS

The participants of this study also shared their views on other things they have been educated to do with regards to healthy eating in order to achieve optimal health.

All the participants (15) mentioned that they have been told to be cautious of the quantity of foods that they eat to avoid increasing their blood glucose levels. One of them commented:

*“They said we don’t need to eat too much because all that we take turn into sugar which increases our glucose level.” (Kwabena, 86 years).*

Some of them said that though the health care workers have told them to eat more plantain, they added that they were also told to limit its intake to two or three fingers. Akua opined:

*“They said I should eat a lot of plantain, but because I don’t have to eat too much, I should always eat two or three fingers of plantain.” (Akua, 78 years).*

The participants were aware of the need to avoid eating large quantities of food, and were also clear on exactly the amount of food to eat at a sitting to avoid raising their blood glucose levels.

Some of the participants (4) added that, they have been told to avoid starving themselves as well as overeating. One participant remarked:

*“They asked me to avoid overeating. They again told me to avoid starving myself. They said if I starve myself it will affect my sugar level, and if the blood sugar level becomes low too, it is dangerous for my health. And they said if I overeat too, it will raise my blood sugar level.” (Akwasi, 42 years).*

Some of the participants were knowledgeable on the effects of overeating and starvation on their blood glucose levels, but the number of those who were aware of this was small.

However, a significant number of the participants (13) said that they were told to eat three meals daily, have their supper early, and regularly take breakfast. One of them opined:

*“We need to eat in the morning and should not skip breakfast. They advised us to eat three meals everyday. They said that we shouldn’t eat late in the evening, so by 5pm or by 6pm, we should have taken our dinner.” (Kofi, 76 years).*

Almost all the participants were aware of the time to eat and the number of meals to eat daily.

Also, two participants mentioned that they have been told to avoid regular consumption of soft drinks, and to consume soft drinks occasionally. One of them recounted:

*“The doctor has told me to shy away from soft drinks. He said they are not good for me, but if I have to take them, it should be once in a while.” (Abena, 47 years).*

In addition, a few of the participants (3) indicated that they have been advised by the health care workers to take sugar or Coca-Cola when their blood glucose level goes down. One of them said:

*“They have told us that, when the sugar level drops to a low level, we need to take Coke or sugar.” (Akosua, 52 years).*

A few of the participants opined the need to lower the intake of soft drinks but echoed the need to treat hypoglycaemia by taking small amounts of sugar or any of the sugary drinks.

#### **4.3.4 SOURCE OF KNOWLEDGE ON DIABETES MANAGEMENT**

All the participants (15) indicated that their knowledge on diabetes and its management is largely due to the education they have received from the doctors, nurses, and dietitians. All the participants (15) also mentioned that they were referred to a dietitian by a doctor before being asked to go and continue their medical treatment at the diabetic clinic, where they constantly receive education on how to manage their condition from the doctors and nurses there. Two-thirds of the participants (10) however admitted that, apart from the instructions given them by the doctors, nurses, and dietitians at Korle-Bu Teaching Hospital on diabetes, they do not depend on any other source for information on their condition. One of them narrated:

*“I only take what the doctors, dietitians, and nurses here have told me. I only abide by what they tell me here to the extent that, I don't listen to anyone else or take anything from anywhere.” (Kwame, 53 years).*

It was obvious that most of the participants solely relied on the knowledge and information they received from the health care providers due to the confidence and trust they have in them and their expertise.

On the other hand, one male participant mentioned that, her sister-in-law who is a nurse also gives him health education on his condition apart from the health care workers. He commented:

*“Luckily on my part too, my senior brother’s wife is a nurse, so she also counsels me. She tells me what to do and what not to do.” (Kwaku, 63 years).*

Kwaku relies on the knowledge of his sister-in-law who is a nurse, as well as that of the health care providers for information on the proper management of his condition.

In addition, two participants opined that, they use the internet to acquire more information on diabetes in order to manage their condition well. One of them remarked:

*“You google and you find out information on the internet. I have read a lot about the condition on the internet.” (Ama, 69 years).*

The two participants who mentioned the internet as a source of information were all enlightened and educated people who had command of the English language.

Furthermore, two male participants opined that, they also listen to the radio to acquire more information about their condition and its management. One of them remarked:

*“Normally, I listen to the radio. I get some information on the condition from the radio too.” (Yaw, 66 years).*

#### **4.4 MOTIVATION TO UNDERTAKE NUTRITIONAL MANAGEMENT OF DIABETES**

All the participants (15) indicated that they had to change their lifestyles, especially their eating habit after they were diagnosed with the condition and after receiving education from the doctors, nurses, and dietitians on the management of diabetes mellitus. They added that it is not

easy effecting all those changes and abiding by all the instructions they have been given, especially that on optimal nutritional management. However, they mentioned that, certain factors have been their source of motivation in driving them to undertake optimal nutritional management of their condition as they have been asked to do despite its challenging nature. They talked about internal factors and external factors that drive them to do the right and healthy things. The internal factors they mentioned have been put under intrinsic motivation, and the external factors they mentioned have been put under extrinsic motivation.

#### 4.4.1 INTRINSIC MOTIVATION

Under this sub-theme, the participants mentioned four factors that motivate them to ensure proper nutritional management of their condition.

For six of the participants, they mentioned longevity as their source of motivation for engaging in healthy eating. One of them remarked:

*“You know life is important, so I don’t even have the urge to go in for the things I have been told to avoid because life is important. I therefore avoid foods that are not good for me so that I can live long.” (Adwoa, 60 years).*

The desire to avoid early death from diabetes was strong enough for some of the participants to engage in proper nutritional management of their condition despite its challenges.

However, for one-third of the participants (5), they indicated that the desire to be healthy is their source of motivation for engaging in healthy eating. One of them opined:

*“It is because of good health. I want to be in good health. So if I’m told healthy eating will help me to be in good health, why won’t I do it? If you ask me the reason why I still look healthy and fit at 86 years, I will tell you my secret is that, I go according to the instructions that are given to me.” (Kwabena, 86 years).*

From the narratives of the participants, health care providers can use patients’ desire to be in good health to motivate them intrinsically to engage in healthy eating.

For three participants, they opined what motivates them to eat well and stick to the education given them is that, they do not want their condition to become worse. One of them commented:

*“I don’t want the condition to become serious, so I strictly abide by what I’m told by the doctor.” (Yaa, 60 years).*

The desire to avoid complications of diabetes was also strong enough to entice some of the participants to engage in healthy eating.

A well-educated female participant who was diagnosed with the condition ten years ago said that her motivation for engaging in healthy eating is that, she wants to be the first person to prove that a healthy lifestyle can cure one of diabetes. She narrated:

*“They say diabetes cannot be cured, it can only be managed. But I want to prove to them in the future that it can be cured. If you have a good lifestyle, it can be cured because it was that lifestyle which brought about the condition. I will be the one to bring that cure. That is what motivates me.” (Ama, 69 years).*

Ama still has inadequate knowledge on the condition.

#### 4.4.2 EXTRINSIC MOTIVATION

Under this sub-theme, the participants mentioned two motivational factors that empower them to be able to undertake proper nutritional management of their condition.

Some of them (5) said that their main source of motivation is to be alive to take proper care of their children. They emphasized that, the need to take good care of their children for them to become better placed in society in the future is what drives them to undertake proper nutritional management of their condition. Two of them remarked:

*“My children are still young, so I don’t have to die and leave them behind. If you give birth and you are unable to take proper care of them for them to become better placed in society, you have not been fair to them. So I have to take proper care of myself, so that I will be able to take care of them. That is what really motivates me.” (Akwasi, 42 years).*

*“What motivates me is my child. If I don’t manage my condition well, and I die, what is going to become of her? I therefore have to take good care of myself because of my child, so my child is my main motivation.” (Abena, 47 years).*

From the narratives of the participants, ill health may serve as an obstacle for them to be able to take proper care of their children, hence, the need to keep themselves healthy to live longer to care for their children.

Also, for two participants, a female and a male, they indicated that relying on God is their main source of motivation for engaging in proper nutritional management of their condition despite its challenges. One of them said:

*“It is God who motivates me. I pray a lot too. I rely on God and pray to Him to be able to do all that the health care workers here have told me. I pray to Him to also take away this sickness from me, and to protect my children from the condition. So depending on God is what motivates me.” (Dede, 68 years).*

It was apparent reliance on God was what motivated some of the participants to engage in healthy eating. This underscores the need to include spirituality in the care of patients with diabetes.

#### **4.5 SUPPORT SYSTEMS RELIED ON IN THE CARE AND MANAGEMENT OF DIABETES**

The participants also shared their views on the various support systems that have enabled them to effectively manage their condition despite the difficulties associated with it. The participants mentioned support from the medical staff, their families, their friends, diabetes peer support groups, as well as spiritual support as their support systems. Nonetheless, from their accounts, these support systems were not integrated into their care by the health care providers.

#### 4.5.1 MEDICAL SUPPORT

All the participants (15) hailed the significant role the doctors, nurses, and dietitians have played in their lives by educating them on diabetes and its management, motivating them to engage in healthy living, and providing medical care for them. They emphasized that, the doctors, nurses, and dietitians have been of tremendous help to them in the care and management of their condition.

This narration from one of the participants sums up the remarks made by all of them.

*“As for the support systems, number one is the support from the doctors, dietitians, and nurses here. Their medical treatment is number one, they really take good care of us. And the way they relate to us, teach us about the condition, and motivate and encourage us to abide by their instructions is exceptional. When we come for review and we are talking among ourselves, all of us praise them. They are really professionals and have us at heart.” (Kofi, 76 years).*

The participants value the medical support they have received from the doctors, nurses, and dietitians, without which they may not have been in good health. This underscores the significant role of health care providers in the care and management of patients with diabetes and other disease conditions.

#### 4.5.2 SUPPORT FROM FAMILY

Also, almost all the participants (13) indicated that one key support system which has been of immense help to them is support from their families. The participants hailed the efforts and contributions of both male and female family members. They added that their family members provide them with monetary support and food, as well as encourage them to eat healthy foods and avoid foods they have been asked to avoid. One of their responses is found below:

*“My sister has been sending me diabetes sugar from abroad, and she sends me money too. My husband also helps me a lot. When I was coming here today, he gave me money, and each time I need something because of my condition, he gives me money for it. He buys me fruits every time, and makes sure I eat well, and do what I have been asked to do. He always talk to me to avoid the things I have been asked to avoid so that I can live long. (Akosua, 52 years).*

The support from family members of patients diagnosed with diabetes cannot be downplayed in any form due to the numerous benefits the patients derive from that. It is imperative for health care professionals to involve families of patients with diabetes in their care.

#### 4.5.3 SPIRITUAL SUPPORT

Additionally, for four participants, prayers and reliance on God has been one of the support systems that have really helped them in the management of their condition. One of them said:

*“I also told you it is God. And I pray a lot. God can do everything. Whatever a doctor says is out of the knowledge he has acquired from books, but with prayers and God, I’m very fine. Because apart from my wife, it is God and prayers that has kept me going all these years since I was diagnosed.” (Kwame, 53 years).*

It appeared that spiritual support was key in helping some of the participants to engage in optimal nutritional management of their condition.

#### 4.5.4 SUPPORT FROM FRIENDS

Furthermore, a male and a female participant also mentioned the support they get from their friends as one of the key support systems they rely on in the care and management of their condition. The male participant commented this way:

*“Currently, I’m staying with a friend of mine who I also work with. He really helps me in managing my condition, and also helps me with the things I need because of my condition. He motivates and encourages me a lot, and ensures that I always eat the right foods, and avoid the foods that will not help me. He really helps me to be able to cope with everything.” (Akwasi, 42 years).*

Health care providers need to also look beyond the families of patients with diabetes in seeking for support systems for them. The narratives of the participants emphasize the need to involve their friends to serve as part of their support systems for positive health outcomes.

#### 4.5.5 DIABETES PEER SUPPORT GROUPS

Out of the fifteen (15) participants, only three (3) of them mentioned that they were educated on diabetes peer support groups by the health care workers. All the three indicated that they were not integrated into any such group by the health care workers after the education. They added that they were just shown where the group meets, and told to join them. Two went to join the group but one did not. The one who did not join the group remarked:

*“The doctors and nurses told me about a diabetes group here and asked me to go and join the group. But I never joined it because I’m not interested. How can I go and publicize my sickness? I can’t join any such group, it won’t be of any benefit to me, and the group cannot heal me of my disease.” (Kwame, 53 years).*

The two participants who went to join the diabetes peer support group echoed that they have stopped attending their meetings for years now, and are no longer part of any such group. One of them narrated it this way:

*“The doctors and nurses told me about a diabetes support group but I don’t go there anymore. We used to meet in a building over there. I was going for some time, but for a long time now, I don’t go. I stopped going some time ago because I didn’t have time. So there was a group, but it’s been years now since I saw the group again.” (Akosua, 52 years).*

In contrast, twelve of the participants mentioned that they have neither been educated nor integrated into any diabetes peer support group by the health care providers. One of them said:

*“I’ve not been educated on any group, and we don’t have any group like that here. It’s rather an individual situation. Once they diagnose you and put you on medication, yours is to be coming for review, that’s all.” (Kwadwo, 58 years).*

From the narratives of the participants, the majority of them have no knowledge on diabetes peer support groups and their relevance. Hence, there is the need for the health care providers to properly educate the participants on these groups, integrate them into the groups, and see to the proper functioning of the groups so that the patients can benefit from these groups.

That notwithstanding, four male participants indicated that, one of their support systems is their fellow patients living with diabetes who educate them and share their knowledge and experiences with them to enable them manage their condition better. One of them said:

*“Sometimes when we come here, some of the patients who were diagnosed so many years ago get up and advise us, and also tell us to do what the health workers here tell us. The last time a woman who has had diabetes for 40 years was advising us on our diet and drugs. It encourages us to adhere to all that the workers here tell us no matter how difficult it is. So for me, I value the knowledge and experiences some of the patients share with us.” (Kofi, 76 years).*

The sharing of knowledge and experiences on diabetes among patients or peers with the condition needs to be given serious attention due to its numerous health benefits.

#### **4.6 SKILLS/PRACTICES ON NUTRITIONAL MANAGEMENT OF DIABETES**

The participants also talked about the foods they usually eat on a daily basis from morning till evening, the times they eat, and the quantity of foods they usually eat. Additionally, they shared their current practices on meal planning, food label reading, the intake of soft drinks, and the intake of alcoholic drinks. Three sub-themes were generated under this theme. They include: dietary practices in the morning, afternoon, and evening, reading of food labels, and meal planning.

##### **4.6.1 DIETARY PRACTICES IN THE MORNING, AFTERNOON, AND EVENING**

Under this sub-theme, the participants shared their views on the number of times they eat in a day, the foods they usually take as breakfast, lunch, and supper, when they eat those foods, as well as the amount of food they eat. They also shared their views on whether or not they take fruits, the types of fruits they usually take, and when they take them. In addition, they talked about their current practices on the consumption of soft drinks and alcoholic drinks.

The majority of the participants (11) mentioned that they usually eat three times in a day because that is what the health care providers asked them to do. One participant narrated:

*“I often eat three times, that’s what the dietician told me.” (Ama, 69 years).*

However, few of them (4) said that they usually eat two times in a day. One of them recounted:

*“I eat twice in a day most of the time, because I don’t really like food.” (Yaa, 60 years).*

The participants avoided starving themselves by usually eating twice or thrice everyday.

Additionally, the accounts of the participants indicated that, all of them consider the eating of breakfast very important as they all mentioned that they often take breakfast. Also, they echoed they usually take light foods for breakfast, but they sometimes resort to heavy foods for breakfast.

The majority of them (9) said that the food they usually eat in the morning is corn porridge or millet porridge with brown bread or wheat bread due to its high fibre content. Some of them added that, they sometimes add non-nutritive sweeteners and/or milk or powdered milk to the porridge they take, as well as vegetables to the bread they take. One of them recounted:

*“For breakfast, I usually take corn porridge or millet porridge because they told us to eat foods rich in fibre. I always take the porridge with wheat bread or brown bread, and I usually add dandelion, cabbage and carrots to the bread. I don’t often add sugar and milk to my food, but sometimes, I add the diabetes sugar and milk or powdered milk to my porridge. I don’t take white sugar, they said it is not good for us, so I only take the diabetes sugar.” (Adwoa, 60 years).*

The participants also emphasized that due to the education given them, they do not take large quantities of the porridge and bread they usually eat during breakfast. One of them remarked:

*“They have advised concerning the amount we take, so they said two slices of bread is okay, two thin slices, we don’t eat plenty. They told us about the amount of porridge to take. They advised us to take only two or three ladles, that’s all.” (Kofi, 76 years).*

Also, five of the participants said they often take oats or wheat with wheat bread or brown bread as their breakfast. They indicated that they sometimes add milk or powdered milk as well as non-nutritive sweeteners to the food. Some of their narrations are as follows:

*“I sometimes take wheat or oats. I don’t add sugar to it, but I sometimes add powdered milk to it. I usually take them with wheat bread.” (Akwasi, 42 years).*

*“I also take wheat. I add the diabetes sugar to the wheat and sometimes milk. I take it with brown bread or wheat bread.” (Dede, 68 years).*

These participants also talked about the quantity of oats and wheat they usually take in the morning. One female participant remarked:

*“For the quantity of oats or wheat I take, have you seen the ladle that is used to scoop soup, I take only three or four ladles. For the bread, I take just a small size. I only take half of one cedi worth of bread.” (Akosua, 52 years).*

From the narratives of the participants, they consumed more whole grains and cereals, as well as moderate amounts of non-nutritive sweeteners, milk, and vegetables during breakfast. They seemed to also keep the quantity of foods they eat in check to avoid overeating.

A number of the participants (8) also mentioned tea with brown bread or wheat bread as one of the foods they usually take in the morning. They added that they often add milk or powdered milk to their tea. Some further opined they sometimes add non-nutritive sweeteners to their tea, and vegetables or egg to their bread. Below are some of their responses:

*“What I usually eat in the morning is tea with brown bread. I don’t add sugar to it, I only add a tablespoon of powdered milk to it. I sometimes add egg to the bread. But in order not to increase my cholesterol level, I boil the egg, I don’t fry it, and I place the boiled egg in the bread.” (Kwabena, 86 years).*

*“If I take tea, I add Carnation Milk to the tea. I take the tea with brown bread or wheat bread almost all the time. I add to my tea the sugar that diabetics are advised to take. I avoid the white sugar that everybody normally takes. I sometimes add pear or vegetables to my bread.” (Kofi, 76 years).*

In contrast, three participants said they usually add white sugar to their tea. One of them opined:

*“I really like tea, so I usually take it every morning. I add white sugar to my tea all the time, that is what I always do.” (Yaa, 60 years).*

On the amount of tea and bread they usually take, the participants indicated that they take just a cup of tea, and a small amount of bread. One of them recounted:

*“I take just a cup of tea. The cup I use is the common tea mug. For bread, I take a small amount, just fifty pesewas worth of bread.” (Kwadwo, 58 years).*

From the narratives of the participants, they seemed to consume increased amounts of beverage, specifically tea in the morning, and avoided excessive consumption by taking just a cup of tea.

On the other hand, one-third of the participants (5) mentioned “kenkey” (a local Ghanaian food prepared with corn) with fish and stew or vegetables as one of the foods they sometimes take as breakfast. One female participant remarked:

*“I sometimes take kenkey with fish in the morning. I take it with tomato stew, or kontomire stew, or cabbage stew. Sometimes I also take it with grinded pepper, sliced tomatoes, and sliced onions.” (Abena, 47 years).*

From the accounts of the participants, they indicated that they usually take a ball of “kenkey” whose size is equal to their closed fists. Abena said:

*“I just go in for one cedi, fifty pesewas worth of kenkey. The size is like my closed fist.” (Abena, 47 years).*

Since kenkey is made with corn, it seemed the participants’ consumption of whole grains was high. Also, their consumption of vegetables seemed to be high in the morning.

Four of the participants also mentioned boiled plantain with vegetable stew and fish as one of the foods they take as breakfast. From the accounts of the participants, they usually take three fingers of plantain due to the education they have received. One of the participants recounted:

*“And by 9am or 10am, I will go in for boiled plantain. I grind my kontomire, add a small amount of oil to it and take it with the plantain. I take it with fish. I take just three fingers of plantain.” (Akua, 78 years).*

Rice with stew, fish, and vegetables was also mentioned by five participants as one of the foods they take as breakfast. They added the quantity of food they usually eat. One of them remarked:

*“Sometimes I eat white rice with kontomire stew and fish or brown rice with vegetables, tomato stew and fish in the morning. For the quantity, I take three ladles of rice because they said we should take two to four ladles of rice, so that is what I do. It is the stew that I add a lot to the rice.” (Akosua, 52 years).*

From the narratives of the participants, it was clear their chief source of protein in the morning was fish, and they consumed more vegetables, whole grains, and cereals when eating in the morning.

It is worth noting that, the accounts of the participants also suggested they usually take their breakfast from 6am to 10am everyday. Below are some of their responses:

*“I take my breakfast anytime between 6am to 8:00am.” (Kwabena, 86 years).*

*“In the morning, I usually eat at 8:00. But if there is a delay, then the eating time shifts to anytime between 8:30 and 9:00. So I eat at 8am if nothing comes my way to prevent me from eating. But if something comes up and I’m unable to eat at that time, I eat around 8:30am or 9:00am.” (Kwame, 53 years).*

*“I eat from 9am in the morning. So anytime from 9am to 10am, I take my breakfast.” (Dede, 68 years).*

It seemed the participants have their breakfast anytime from early morning to mid-morning everyday.

In addition to their above narrations on the intake of breakfast, the participants shared their views on the foods they usually take as lunch, as well as the quantity of foods they take.

Nine of them said they usually take fufu with soup and fish as their lunch. They added that they usually take their fufu with groundnut soup, palm nut soup or light soup. They also indicated that they sometimes take it with chicken instead of fish. One of them narrated:

*“I often eat fufu in the afternoon. I take it with light soup or palm nut soup or groundnut soup. I usually take it with fish, but occasionally, I take it with chicken.” (Kwabena, 86 years).*

The participants however added that they take more soup but the size of the fufu they usually eat is equal to either one or two of their closed fists. One of them remarked:

*“For the fufu, I have my limit, I don’t take much. The size of the fufu I take is like my fist. It’s the soup that I take a lot.” (Afia, 58 years).*

Fufu is a local Ghanaian food prepared with cassava and plantain or with only plantain. Also, Ghanaian soups are largely prepared with vegetables. Thus, it appeared the participants consumed more vegetables, fish, and staple foods, as well as moderate amounts of chicken in the afternoon. They also appeared to keep in check the quantity of foods that they eat.

Eight participants however said that they usually take boiled plantain with vegetable stew and fish at lunch. A few of them opined they sometimes take it with egg instead of fish, while some of them indicated that they occasionally take boiled yam instead of boiled plantain. Yaw commented:

*“I usually take boiled plantain with kontomire stew, or sometimes cabbage stew or garden eggs stew. I usually take it with fish, but sometimes I go in for egg. Also, sometimes, I take boiled yam instead of boiled plantain.” (Yaw, 66 years).*

On the quantity of boiled plantain and boiled yam they usually take, the participants said that they often take two to three fingers of plantain, and four to five slices of yam. One of them recounted:

*“I take two fingers if the size of the plantain is big, but I take three if the size is small. For yam, I sometimes take four slices, other times too I take five slices of yam.” (Akosua, 52 years).*

In addition, some of the participants (7) opined that they usually take rice and stew with fish as lunch. They mentioned they usually take the rice with tomato stew or kontomire stew, and sometimes add chicken or egg but rarely add meat to the food. One participant said:

*“I take rice with tomato stew or kontomire stew. I usually take fish. Sometimes too I take it with chicken or egg.” (Yaa, 60 years).*

From the accounts of the participants, they usually take two to four ladles of rice due to the education they were given on the quantity of foods to take. One of them narrated:

*“I don’t take much of the rice, I take about three ladles.” (Abena, 47 years).*

Three participants also mentioned kenkey with fish and ground pepper or okro stew as one of the meals they sometimes have for lunch. The participants added that, they usually take just one ball of kenkey because they have been advised not to eat too much. One of them remarked:

*“With the kenkey, I take it with fish. If I have okro stew, I use that. If I don’t have, I prepare pepper. I buy one ball of kenkey.” (Ama, 69 years).*

From the above narratives, the participants eat increased amounts of vegetables, roots, tubers, and fish, as well as moderate amounts of oil, whole grains, chicken, eggs and cereals during lunch.

Three other participants indicated that, they sometimes take banku or rice balls with soup and fish or chicken for lunch. They added that, they usually take one or two balls of banku or rice balls which is equal to the size of one or two of their closed fists. One of them remarked as follows:

*“I usually eat banku or rice ball in the afternoon. I take it with light soup, groundnut soup, or palm nut soup. I take them with dry fish and chicken, and on some few occasions I take them with meat. I only take a small quantity of it, it is like my fist.” (Yaa, 60 years).*

Banku is a local Ghanaian food prepared with corn and cassava dough, while rice balls is prepared with rice. It seemed the participants consume appreciable amounts of cereals, whole grains, vegetables, chicken, fish, and oil when eating in the afternoon.

On the time they usually have their lunch, the accounts of the participants indicate that they often have their lunch from 12pm to 3pm. Some of them commented:

*“I eat by 1pm in the afternoon. So I take my lunch anytime from 12pm to 1pm.” (Abena, 47 years).*

*“Between 1pm to 2pm, I go in for my lunch.” (Ama, 69 years).*

*“In the afternoon, I eat around 2pm till 3pm.” (Adwoa, 60 years).*

From the above narratives, by mid-afternoon, the participants would have taken their lunch.

The participants of this study again shared their views on the foods they usually take as supper, and the quantity of foods that they eat. The participants indicated that they usually eat early in the evening, and when they do, they take in heavy foods such as fufu, banku, boiled plantain, boiled yam, kenkey, and rice as their supper. However, most of them said that when they become hungry again later in the evening, they eat light foods such as oats, porridge, tea, and fruits due to the education they received to avoid eating heavy foods in the night as well as avoid starving themselves. The types of heavy foods the participants usually take as their supper are not different from the ones they usually have as lunch. Also, the types of light foods they take in when they feel hungry in the night are also not different from the light foods they usually take in the morning.

Ten participants mentioned that they usually take fufu with light soup, groundnut soup or palm nut soup and fish as their supper. They added that the size of the fufu they take is like the size of their closed fists. A few of them said that they sometimes add meat to their food. One of them recounted:

*“I usually take fufu in the evening. I take my fufu with light soup or groundnut soup or palm nut soup. I normally take it with fish. Sometimes too, I take it with meat. The size of the fufu I take is like my closed fist.” (Yaw, 66 years).*

Also, almost half of the participants (7) said they usually take banku, whose size is about two of their fists with fish and stew or ground pepper, tomatoes, and onion as supper. One of them opined:

*“I take banku with okro stew and fish. Sometimes, I also take it with pepper, sliced tomatoes, sliced onion, and fish, usually tilapia. The size of the banku I take is like my closed fist. When I am very hungry, I add half the size of my closed fist to it. But I take more of the okro stew, and if I’m taking it with pepper, I take more of the sliced tomatoes and onion.” (Akosua, 52 years).*

But for seven participants, they opined that one of the foods they take in the evening is boiled plantain with vegetable stew and fish. One female participant remarked:

*“I usually take boiled plantain with dandelion stew or kontomire stew or garden eggs stew, and fish.” (Ama, 69 years).*

The participants added that they usually take either two or three fingers of plantain when eating.

Two of them narrated as follows:

*“For plantain, I will say the fingers I take is usually three. That is what I normally take.” (Kofi, 76 years).*

*“As for plantain, I take just two fingers.” (Ama, 69 years).*

Additionally, three participants said they sometimes take boiled yam with stew and fish. They indicated that they usually take four or five slices of yam. One male participant recounted:

*“I sometimes take yam. I take about five slices. I take it with kontomire stew, or cabbage stew, or garden eggs stew, and fish. I take four to five slices of the yam, that is what they told me.” (Yaw, 66 years).*

Furthermore, eight participants indicated they usually take either one ball of kenkey with ground pepper and fish or rice with stew, vegetables, and fish in the evening. They opined they do not eat much of the kenkey or the rice. One of them narrated:

*“In the evening I take rice. For the rice, I add vegetables and fish, then stew. I buy just two cedis of rice. I sometimes also eat kenkey and shito or pepper with fried fish in the evening. I eat just one ball of kenkey.” (Kwaku, 63 years).*

From the narratives above, it seemed the participants do not overeat and they also consume increased amounts of fish, vegetables, roots, tubers, and whole grains during supper.

On the time they usually take their supper, with the exception of one participant, all the other participants said that they mostly take their supper from 4pm to 7pm. Some of them opined:

*“I take my last meal anywhere between 4:00pm to 5:00pm.” (Akosua, 52 years).*

*“In the evenings too, I eat between 5pm and 5:30pm. So latest by 6pm, I would have taken my dinner.” (Kwabena, 86 years).*

*“I eat in the evening, I usually eat around 6:30pm till 7pm.” (Yaa, 60 years).*

On the contrary, a 63-year-old man who has been diagnosed with the condition for 25 years said that, he usually takes his supper between 6pm and 10pm due to the nature of his work. He opined:

*“In the evening I eat anytime from 6pm to 10pm. Because of the nature of the job I’m doing, I sometimes eat late. I don’t have time for my food because of the nature of my job.” (Kwaku, 63 years).*

Almost all the participants avoid late night eating and have their supper early.

Most of the participants (9) also said that they occasionally take in light foods when they become hungry later in the evening after taking their supper. One of them recounted:

*“Once a while I feel hungry when I’m about sleeping. If I am hungry at that time, I eat. Around that time, I don’t eat a heavy food, I just take in something light like oats, porridge, tea, banana, or biscuit, and I don’t eat much.” (Kwame, 53 years).*

It was evident that when the participants occasionally become hungry in the night after taking their supper, most of them take in light foods at that time and avoid starving themselves in order not to get hypoglycaemic episodes.

The participants also talked about their practices concerning the consumption of fruits. They indicated that they take fruits regularly. Some of them opined:

*“I take a fruit everyday. Every blessed day I take a fruit.” (Kwabena, 86 years).*

*“I take fruits three to five times in a week.” (Yaw, 66 years).*

However, seven of them indicated that they usually take fruits in the evening. One of them said:

*“I usually eat fruits in the evening.” (Adwoa, 60 years).*

Also, five of them echoed that they usually take fruits in the afternoon. One of them recounted:

*“For me, it is in the afternoon that I often take my fruits. I take some before I take my lunch. Even after lunch I take some too.” (Abena, 47 years).*

Additionally, three of them said that they usually take fruits in the morning. One of them remarked:

*“I usually try to eat my fruits before taking my breakfast, or sometimes together with my breakfast. So usually, breakfast will be set, and the fruits will be set alongside too.” (Kofi, 76 years).*

It was apparent the participants consume appreciable amounts of fruits everyday. It seemed they take more fruits in the evening, moderate amounts in the afternoon, and low amounts in the morning.

From the accounts of the participants, most of them (12) said that the fruits they usually take are orange, banana, pawpaw, and mango. One participant commented as follows:

*“I usually take in a lot of pawpaw, then banana and orange. I usually take mango and orange in the morning, then pawpaw and banana in the evening.” (Yaa, 60 years).*

However, a few of the participants (4) indicated that, they only take half ripe pawpaw because that is what the health care workers have told them to take. One female participant remarked:

*“For pawpaw, I don’t go in for the ripe ones, I go in for the ones that are not so ripe.” (Akosua, 52 years).*

Also, a few of the participants (5) stated that they also take coconut, pineapple, apple, and pear. One of them recounted:

*“I usually take apple or coconut. Sometimes too I take pineapple. Even pear, I take that one too sometimes.” (Dede, 68 years).*

It was obvious the participants consume a variety of fruits in addition to the foods they eat everyday.

In addition, the participants talked about their practices concerning the consumption of soft drinks and alcoholic drinks. Some of the participants echoed they have cut down their intake of alcohol and soft drinks. However, some of them said that they do not take alcohol and soft drinks following their diagnosis.

The majority of the participants (10) indicated that they currently take soft drinks in moderation and occasionally, but not on regular basis as they used to do prior to being diagnosed of their condition. Most of them mentioned that they dilute Coca-Cola and Fanta with water before consuming it, and only take half a glass of Malt. One male participant commented this way:

*“I don’t take soft drinks that often. I only take them once in a while. If I’m taking a drink like Coke or Fanta, I pour half of it away and mix the remainder with one sachet of water before taking it. For malt, I only take half the amount, that’s all, I don’t mix the half that I take with water.” (Kwame, 53 years).*

From the above narrative, it seemed the participants are cautious of increasing their blood glucose levels with excessive or regular consumption of soft drinks.

Furthermore, two of the participants opined that in addition to taking soft drinks occasionally, they usually take Coca-Cola when their sugar level is too low. They added that the health care workers gave them that advice. One female participant recounted:

*“I take Coke when my sugar level goes down. The doctors and nurses have told us to take Coke when our sugar level drops, so that’s what I do. But apart from that, I take Coke or Malt or Fanta or Soda water occasionally.” (Akosua, 52 years).*

In contrast, two participants mentioned that they do not consume soft drinks. One of them said:

*“I don’t even like soft drinks because it will give me health problems, so I avoid it.” (Adwoa, 60 years).*

From the above narratives, the participants have a healthy dietary practice regarding soft drinks consumption since they take it in moderation or abstain from it.

Also, the majority of the participants (8) indicated that they do not take alcohol. They added that they were not taking alcohol before they were diagnosed, so there is no reason for them to start taking alcohol now. One of them commented this way:

*“As I told you, I don’t drink. I wasn’t drinking even before diagnosis, and up till now I don’t drink.” (Kwaku, 63 years).*

Three of the participants who were taking alcohol prior to their diagnosis mentioned that, they have now stopped taking alcohol because of their condition. One of them said:

*“It’s alcohol that I was taking, but ever since I was diagnosed, I have stopped.” (Akwasi, 42 years).*

On the contrary, two male participants indicated that, they continue to take alcohol but they take it occasionally and in moderation unlike what they were doing prior to their diagnosis. One of them remarked:

*“Occasionally, I take beer. Now, I don’t take a bottle of beer, I often take a glass of beer. I’ve now limited how I was taking alcohol before I got diabetes. It is on rare occasions that I even take a bottle of beer now. But even with that I don’t take more than a bottle of beer now.” (Yaw, 66 years).*

From the above narratives, the participants have a healthy dietary practice regarding alcohol consumption since they abstain from alcohol consumption or take it in moderation.

#### **4.6.2 READING OF FOOD LABELS**

Under this sub-theme, all the participants shared their views on the education they have received from doctors, nurses, and dietitians on the reading and usage of food labels, as well as their current practices on the reading and usage of food labels.

The majority of the participants (8) said that they were educated on the use of food labels. Five of them mentioned that they were told to only check the expiry date of all processed foods, canned foods, and bottled foods, and that is what they do when they buy those food products. They also added that, they rarely buy such food products. One of them remarked as follows:

*“They educated us to check the expiry date of processed foods. For me, I don’t like canned foods, so I hardly buy them. If I buy those products, expiry date is what I check. I often check the expiry date of such products.” (Afiya, 58 years).*

Two male participants however said that, they were educated to check the manufacturing date of such foods in addition to the expiry date, and that is what they do. One of them recounted:

*“They educated us on the food labels. They said the manufacturing date and expiry date are very important, so we should always check them before we buy canned foods or processed foods. I always make sure I see the manufacturing and expiry dates on the labels of food products before I buy them. If I don’t see the dates, I won’t buy the food product.” (Kwaku, 63 years).*

An 86-year-old man who has been diagnosed of the condition for 23 years said that, he has been told by the health care workers to check both the sugar content and expiry date of all processed foods before he buys them and that is what he does when he buys such products. He narrated:

*“Personally, I don’t like processed foods. But if I’m buying them what I check on those things is the expiry date. If it has expired, I won’t buy it. I know that all those foods contain sugar, so I check the sugar content too. I often check the expiry date and the sugar content of those foods, because that is what they told me over here.” (Kwabena, 86 years).*

A female participant and a male participant said that they were not given any education on the reading and usage of food labels by the health care workers, however, they received such education from watching or listening to health programmes on the television and the radio. They indicated that, all they check on food labels is the expiry date of the products, because that is what they heard on the radio and television. One of them commented this way:

*“The health personnel here didn’t teach us about food labels. I heard about food labels on the television when I was watching a health program. They said that canned foods and bottled foods are not good for diabetics so we need to avoid them. But if we have to buy them, we need to check their expiry dates. So when I have to buy such products, I only check the expiry date. I often check it.” (Adwoa, 60 years).*

From the above narratives, it appeared all the participants who have received education on food labels have deficient knowledge and skills on the reading and usage of food labels.

On the other hand, five out of the fifteen participants said that, they have not received any education on the reading and usage of food labels from the health care workers or from any other source. Four of them opined that, they do not check anything when they buy those food products. Only a 47-year-old woman among them opined that she often checks the expiry date and sugar content of such food products because of her health. Some of their responses were as follows:

*“The health workers here haven’t taught us anything about food labels. They didn’t tell us that, so I don’t know anything about the food labels. I don’t know the meaning of the things there, so I don’t check for anything before I buy those products. But for me, I don’t like the canned foods and bottled foods, so I hardly buy them.” (Akua, 78 years).*

*“I wasn’t given any education on food labels by the health personnel here, but I always check the expiry date of those products. I also check if they have written sugar free on it. Those are the two things I often check for.” (Abena, 47 years).*

It seemed the inadequate knowledge and teaching skills of the health personnel on food label reading may have accounted for the participants’ lack of knowledge and skills on food label reading.

#### **4.6.3 MEAL PLANNING**

Under this sub-theme, the participants indicated that they often plan their meals by deciding in advance what they want to eat the next day or the next couple of days. They also shared their views on the factors they consider when planning their meals or opting for a particular food.

Most of the participants (12) mentioned that, the key thing they consider before deciding to eat a particular food or not is whether the food will increase their blood glucose level or not, and whether they have been asked by doctors, nurses, and dietitians to eat that food or avoid it. Therefore, for the majority of the participants, sticking to the instructions received from the health care workers is the only thing they factor when planning their meals. One of them narrated:

*“For me, I only check if the food will not raise my sugar level. So if it is something I have been told by the nurses, doctors, and dietitian to avoid, I will not go near it. But if it is something that I have been asked to eat, that one I know it will not give me problems so I will eat it.” (Akosua, 52 years).*

However, a few of the participants (3) also stated that, the only thing they consider before deciding to eat a particular food or not is their appetite for that food. One of them said:

*“What I have appetite for is what I consider, so it is if I have the appetite for this food or that particular food, that’s all.” (Yaa, 60 years).*

It was clear the participants have knowledge and skills on meal planning since they keenly factor the health education given them on healthy eating when deciding what to eat.

#### **4.7 CHALLENGES TO ADHERENCE OF OPTIMAL NUTRITIONAL MANAGEMENT OF DIABETES**

The majority of the participants (9) also expressed their views on the things that sometimes prevent them from engaging in optimal nutritional management of their condition. Under this theme, the participants’ accounts indicated five factors that sometimes hinder them from undertaking optimal nutritional management or engaging in healthy eating. Five sub-themes therefore emerged from the responses of the participants. They included: financial constraints, non-availability of preferred foods, loss of appetite, job demands, and appetite or desire for foods to avoid.

A few of the male participants (3) said that they sometimes do not have money to buy the foods they have been told to eat because of the expensive nature of the foods. One of them narrated:

*“I prefer the brown rice because of my condition but that one is too expensive. So I don’t take rice frequently. And fruits too, some of them are very expensive, so I only buy those ones which are cheap.” (Kwame, 53 years).*

It was obvious health care providers need to seriously consider the costs of the recommended or healthy foods they tell patients, and offer them alternatives that are equally healthy but affordable.

In contrast, three participants indicated that they find it difficult getting the foods they have been asked to eat because they are not readily available sometimes, leaving them with no choice than to go in for the foods they have been asked to avoid. One of them remarked:

*“For bread, I prefer to eat brown bread or wheat bread. But sometimes, these are very difficult to get, so I find myself eating the white bread which they have advised us against because that one is always available.” (Kofi, 76 years).*

It was evident that health education to patients should be tailored to their needs by educating them on the readily available and common foods in their vicinities and work places which are equally healthy and good for them.

Five of the participants however opined that, their major challenge to always eating healthily is that, they sometimes experience loss of appetite because of their condition. Some of them said:

*“I don’t have appetite for food lately.” (Adwoa, 60 years).*

*“I’ve been adhering to whatever instructions the dietitian has given me, just that nowadays, I can’t eat much. And sometimes I even have to force and eat because of my medication. I often don’t feel hungry or feel for food.” (Yaa, 60 years).*

The participants appeared to have a positive attitude towards healthy eating, and seemed to engage in healthy eating despite their challenge of sometimes experiencing loss of appetite.

For three male participants, they asserted that the nature of their jobs sometimes prevent them from making time to go in for the recommended foods. They added that this sometimes make them settle for any available food which may not be necessarily healthy. One of them said:

*“It’s just that sometimes I don’t have time because of the demanding nature of my job to be searching for this food or that food, so I sometimes eat whatever is available.” (Akwasi, 42 years).*

From the participants’ accounts, it was apparent some of them give priority to their jobs.

Also, for three female participants, their narrations indicated that they have appetite for some of the foods they have been asked to avoid. They therefore go in for those foods contrary to the education they have received from the doctors, dietitians, and nurses that those foods will have negative impact on their health. One of them recounted as follows:

*“I usually take white bread. I like white bread than all the other types of bread, but they said that is not good for me so I should stop taking it. But for me, I don’t like the others, the white bread is what I like, so that’s what I normally take. I eat it even though I’ve been told not to take it.” (Yaa, 60 years).*

It seemed the desire to eat unhealthy foods is sometimes too strong for some participants to control.

#### 4.8 REFLECTIONS OF THE RESEARCHER ON THE FINDINGS

These are ideas and thoughts with respect to the data provided by the participants which need to be considered. Reflections on the findings are intended to represent critical inferences made from the interviews in the light of the circumstances under which the views of the participants were expressed. The participants of this study willingly availed themselves to be recruited and interviewed. They were very cooperative throughout the study and freely shared their views with the researcher, as well as gave rich information on their knowledge and experiences on the nutritional management of diabetes mellitus. The researcher’s interaction with the participants on their socio-demographic characteristics put the participants at ease, which helped to establish rapport for the subsequent interactions. The researcher did not encounter any challenge in recruiting and interviewing the participants. The only problem the researcher faced was that, he

had to pause in the course of interviewing one participant for the participant to eat and take her medications, since the time for taking her medications was almost due. However, the interview continued immediately after she was done eating and taking her medications. In addition, the participants identified themselves as patients who were happy to interact with the researcher who is a nurse.

#### **4.9 SUMMARY OF FINDINGS**

This chapter was centred on the findings on the knowledge of nutritional management of diabetes mellitus among patients living with the condition. In line with the research objectives of this study and the Information-Motivation-Behavioural Skills (IMB) model, which served as the conceptual framework for this study, five themes and nineteen sub-themes emerged from the data gathered. The major themes that emerged included: knowledge on nutritional management of diabetes, motivation to undertake nutritional management of diabetes, support systems relied on in the care and management of diabetes, skills or practices on nutritional management of diabetes, and challenges to adherence of optimal nutritional management of diabetes.

The findings of the study revealed that the fifteen participants who took part in this study are generally knowledgeable on the nutritional management of diabetes. Nonetheless, some of the participants gave conflicting information on some foods on whether to avoid taking it, decrease its intake or increase its intake. The participants were also well motivated to carry out the nutritional management of their condition, and had varied support systems that helped them in the care and management of their condition. Though the participants talked about varied support systems that had been of help to them, these support systems were not integrated into their care by the health care providers. There was therefore poor integration and involvement of their families, friends,

and spirituality into their care by the health care providers. Also, the participants' education and integration into diabetes peer support groups by the health care providers was poor. Despite citing some challenges that sometimes hindered them from engaging in healthy eating, the participants of this study generally engaged in healthy eating per their current dietary practices and preferences. Additionally, though the participants generally had knowledge and skills on meal planning, they however had deficient skills and knowledge on the reading and usage of food labels.

## **CHAPTER FIVE**

### **DISCUSSION OF FINDINGS**

This chapter focuses on the discussion of the key findings of this study with other research studies that have been carried out in the same area. This study was conducted to explore the knowledge on nutritional management of diabetes mellitus among patients with diabetes who attend clinic at the Korle-Bu Teaching Hospital, Accra. This section is presented in line with the research objectives which emanated from the constructs of the information-motivation-behavioural skills model, which served as the conceptual framework for this study.

#### **5.1 KNOWLEDGE ON NUTRITIONAL MANAGEMENT OF DIABETES**

Poor knowledge on nutritional management of diabetes results in poor self-management. This underscores the need for patients with diabetes to acquire adequate knowledge on the nutritional management of their condition in order to be able to successfully engage in optimal self-management (Eichler, Wieser, & Brügger, 2009; Harris & Wallace, 2012). The participants of this study were generally knowledgeable on the nutritional management of diabetes mellitus. With regards to the knowledge of participants on the nutritional management of their condition, this study identified their lifestyle prior to diagnosis, their knowledge on foods to take and avoid, their knowledge on healthy eating habits, and their source of knowledge on diabetes management.

##### **5.1.1 LIFESTYLE BEFORE DIAGNOSIS (IGNORANCE OF REPERCUSSIONS OF POOR LIFESTYLE BEFORE DIAGNOSIS)**

Regarding their views on their knowledge level on the nutritional management of diabetes, the participants talked about their lifestyle prior to being diagnosed with diabetes mellitus. For

most of them, they were not cautious of what they were eating prior to diagnosis. The participants of this study were not cautious of the types of food they were eating and the quantity of foods they were eating prior to diagnosis because they did not know the repercussions of their lifestyles. Their unhealthy eating habits and consumption of unhealthy diets may have contributed to them acquiring diabetes mellitus. This finding is consistent with the findings of various studies, Knowler et al. (2009), Ramachandran et al. (2006), and Salas-Salvadó et al. (2011) which showed that unhealthy eating habits and eating of unhealthy diets are significantly associated with a higher incidence of diabetes.

This study also revealed that eight out of the fifteen participants indicated they used to take in increased amounts of soft drinks, sweets, and sugary products prior to diagnosis. This finding suggests that increased intake of soft drinks, sweets, and sugary products may increase one's risk of getting diabetes. This finding is congruent with the findings of similar studies that have highlighted the strong association between the intake of soft drinks and sweetened products and the incidence of diabetes mellitus (Malik, Schulze, & Hu, 2006; Schulze et al., 2004). For instance, a study conducted by Lustig et al. (2012) noted that sugar is a poisonous substance, and too much consumption of it destroys the pancreatic beta cells. The ultimate effect of this is the cessation of insulin production and secretion, which may result in diabetes mellitus (Hinkle & Cheever, 2014).

Again, this study found that five of the participants were into moderate and severe intake of alcohol prior to diagnosis while the majority of them (10) were not consuming alcohol prior to diagnosis. It appears that abstinence from alcohol, moderate consumption of alcohol, and excessive consumption of alcohol may all have played a role in the development of diabetes in the participants. These findings partly concur with the findings of various studies which have established that severe alcohol intake and abstinence from alcohol increases one's risk of getting

diabetes mellitus (Baliunas et al., 2009; Koloverou et al., 2015), while moderate intake of alcohol lowers one's chances of getting diabetes mellitus (Kerr & Ye, 2010; Rasouli et al., 2013). Research studies have showed that moderate alcohol intake leads to an increase in insulin sensitivity which decreases one's risk of diabetes mellitus, while severe alcohol intake leads to an increase in body weight, and a decrease in insulin sensitivity, thereby increasing one's risk of diabetes mellitus (Kim & Kim, 2012; Koppes, Dekker, Hendriks, Bouter, & Heine, 2005). Though various research studies have established that alcohol abstinence leads to an increased risk of diabetes, it appears the underlying reasons for this association has not yet been established. This calls for further research in this area to unravel the reasons for this association.

In addition, this study highlighted that a few of the participants mentioned engaging in late night eating prior to their diagnosis. These participants attributed this eating habit to job demands and getting home late from work. They were also not mindful of the time they were eating as they mentioned that they were usually eating heavy foods, particularly those rich in carbohydrates in the night. These findings are corroborated by several studies by Nakajima and Suwa (2015), Lopez-Minguez et al. (2018), and Sato et al. (2011), who have all found a strong correlation between late night eating and weight gain, as well as high blood glucose levels. Weight gain or obesity can lead to decreased insulin sensitivity. Also, late night eating elongates the time for postprandial glucose spike, resulting in an increased blood glucose level in an individual for a long time. The resultant effects of all these can lead to an increased risk of diabetes mellitus. The findings of the current study are also in line with a study conducted by Gallant et al. (2014) which showed that, individuals who mostly engage in late night eating usually go in for foods rich in carbohydrates during that time. Another similarity between the findings of the current study and other studies cited above is that, the participants had their dinner between 8:30pm and 12 midnight.

The findings of this study therefore give credence to the findings of other studies which have established an association between late night eating and high incidence of diabetes mellitus.

### **5.1.2 KNOWLEDGE ON FOODS TO TAKE AND AVOID**

The findings of the current study revealed that the majority of the participants were knowledgeable on the need to increase their consumption of fruits by taking them everyday or regularly. This is in line with another study conducted among patients with diabetes in Ghana in 2014 which found that the participants were aware people with diabetes need to increase their consumption of fruits (Doherty et al., 2014). These findings also resonate with another study that has asserted that, patients with diabetes should be educated and urged to take in more fruits regularly due to its health benefits such as ensuring healthy glycemic levels and decreasing cardiovascular risk (Christensen, Viggers, & Gregersen, 2015). The findings from Doherty et al. (2014) and Christensen et al. (2015) seem to centre on the general consumption of fruits for the management of diabetes, however, the participants of the current study went further to mention specific fruits they have been told to increase its intake, avoid, and decrease its intake in the management of their condition. Some of them revealed they have received education to avoid sugar cane, ripe pawpaw, and pineapple due to their high sugar content while others said they have been told to decrease their intake of pineapple, pear, and apple due to their sugar content. Most of the participants also mentioned banana as the common fruit they have been told to increase its consumption. These findings are partly in tandem with the findings of a study conducted in Sri Lanka among patients with diabetes which showed that the majority of the participants have received education from health care providers to avoid ripe pawpaw and only eat half-ripened pawpaw (Ranasinghe et al., 2015). In contrast, a study conducted in Nigeria among patients with diabetes found that, the majority of the participants said fruits should be avoided by patients with

diabetes. The Nigerian study further found that, the participants received inadequate health education on the dietary management of the condition. Also, they were mainly educated on dietary management by laboratory scientists, and rarely received health education on their diet from nurses and doctors, even though nurses and doctors had the most frequent contact with them (Okolie, Ehiemere, Iheanacho, & Kalu-Igwe, 2009). The reason for the contrasting findings may therefore be due to the type of health care providers who gave health education on dietary management to the participants in the Ghanaian and Nigerian studies, as well as the type or content of health education they gave to the participants on the consumption of fruits.

Various research studies have also established the health benefits of regular consumption of high fibre diets, particularly whole grains and cereals in managing diabetes mellitus. High fibre diets ensure weight control, better glycemic control, and healthy glycated haemoglobin levels in patients with diabetes (McRae, 2018; Yang et al., 2013). The findings of the present study indicated that, most of the participants were knowledgeable on the need to increase their intake of foods rich in fibre due to its health benefits. They singled out whole grains and cereals such as corn, millet, oats, wheat, brown rice, and unrefined white rice (the local Ghanaian rice) as the fibre-rich diets they have been asked to increase its consumption. The participants of this study were therefore knowledgeable on the need to resort to high fibre diets, particularly whole grains and cereals as their source of carbohydrates in order to ensure effective nutritional management of their condition. This is in tandem with a study conducted in New Zealand among patients with diabetes which highlighted the adequate knowledge of the participants on the need to increase their intake of whole grains and cereals such as oats and brown rice because they are healthier foods for people living with diabetes (Lawrence, Reynolds, & Venn, 2017).

Also, increased consumption of vegetables by people living with diabetes enables them to achieve optimal glycemic control and to have improved quality of life. This underscores the need for patients living with diabetes to opt for this source of carbohydrates (Dias & Imai, 2017; Gray, 2015). The findings of the current study showed that the participants were aware of the need to eat more vegetables or add more vegetables to their food. The participants opined that, they were also educated to take in more stew and soup when eating. This is worth noting because the stews and soups in Ghana are predominantly prepared with a variety of vegetables. Therefore this call by the health care providers to the participants buttressed the need for them to increase their vegetable consumption, as well as served as an alternative means of helping the participants consume more vegetables. This finding is in line with the findings of two studies conducted among patients with diabetes in Thailand and Sri Lanka which indicated that, the participants mentioned the need for increased vegetable intake for people with diabetes due to its positive impact on their health such as ensuring healthy blood glucose levels (Ranasinghe et al., 2015; Thojampa, 2019).

In addition, the findings of the present study revealed that the participants were educated to avoid fatty and oily foods or decrease its consumption in order to keep their blood glucose levels, cholesterol levels, and body weight in check. Some of them mentioned that, they have been told to scoop out the oil on the surface of palm nut soup before eating, keep their intake of groundnut soup in check, as well as use a small quantity of oil when preparing their foods. One of the participants indicated that she has been told to use olive oil to prepare her food due to its healthy nature. The participants of the current study were thus generally knowledgeable on the need to limit their intake of fats, oil, and cholesterol. Also, to a large extent, the participants seemed to have knowledge on the need to consume healthy fats and oil and avoid the unhealthy ones. This concurs largely with a study conducted in Greece among patients living with diabetes mellitus

which mentioned that the participants were knowledgeable on the need to consume unsaturated fats, and avoid saturated fats and cholesterol to keep their glycemic levels in a healthy range (Grammatikopoulou et al., 2017). These findings however contradict a study carried out in Ireland among patients with diabetes which found that the participants did not have adequate knowledge on the effects of fats and oils consumption on their cholesterol levels and blood glucose levels. The study also posited that, there appeared to be a poor understanding of the effects of fats and oils among the participants despite the health education received from their health care providers (Breen et al., 2015). The poor understanding of the participants of the Ireland study on the effects of fats and oils may therefore have accounted for the different findings of the studies conducted in Ghana and Ireland.

Various studies have also established that proper nutritional management of diabetes mellitus entails the consumption of low to moderate amounts of dairy products by patients living with the condition (Ley, Hamdy, Mohan, & Hu, 2014). The findings of the current study posited that the participants were aware of the need to limit their intake of dairy products such as milk and eggs, especially the intake of eggs. With the intake of milk, the majority of the participants opined that they have been told to opt for Carnation Milk, which is a cholesterol-free milk produced in Ghana in order not to increase their cholesterol levels. Generally, the participants of the present study had adequate knowledge on the intake of dairy products. This is in line with a research conducted in 2016 which indicated that patients living with diabetes in Sri Lanka have adequate knowledge on the intake of dairy products. The participants of the Sri Lankan study were knowledgeable on the need to consume eggs and milk, specifically, full cream milk in moderation. Thus, unlike the participants of the current study who were aware of the need to consume a cholesterol-free milk, the participants of the Sri Lankan study were not aware of the need to opt

for non-fat milk, and only knew of full cream milk (Senadheera, Ekanayake, & Wanigatunge, 2016).

Similarly, research works by Nwose et al. (2017) and Ogbonna et al. (2018) have emphasized the high glycemic index of cassava, which is a common staple food in sub-Saharan Africa. Hence, like all other foods that have been found to have a high glycemic index, health care providers usually educate patients living with diabetes to decrease their intake of cassava to keep their blood glucose levels in check. The present study found that most of the participants were aware they have to decrease or avoid the intake of cassava due to its high starch content and increase their intake of plantain. A few participants opined that they have been told to cut down on their intake of yam or avoid it because of its starch content. These findings concur with another study conducted in Ghana which showed that the participants had received education from their health care providers to decrease or avoid the consumption of cassava and yam, and instead increase their intake of plantain to avoid raising their blood glucose levels (Doherty et al., 2014). These findings seem to suggest that, health care providers in Ghana sometimes educate patients with diabetes to avoid consuming cassava and yam, instead of telling them to take those foods in moderation in their quest to help the patients achieve healthy blood glucose levels.

Also, various research studies have posited that, patients living with diabetes mellitus are supposed to avoid or rarely consume refined sugar and sugary products due to their high glycemic index and their potential to increase one's body weight (Asif, 2014; Stanhope et al., 2009). Most of the participants of the present study said that they have been told to avoid taking in white sugar or refined sugar and other sugary products such as sweets and cakes. They added that they have been educated to go in for non-nutritive sweeteners in order to avoid raising their blood glucose levels. These findings concur with a Ghanaian study which found that patients with diabetes were

told by their health care providers to avoid sugary foods and white sugar to keep their blood glucose levels in healthy ranges (Doherty et al., 2014). Though the participants of the present study were aware of non-nutritive sweeteners, the participants of the other Ghanaian study by Doherty et al. (2014) were ignorant of that, and did not know of any alternative food product for sugar.

In order to ensure better glycemic control and insulin sensitivity, as well as decrease one's risk of cardiovascular diseases, patients living with diabetes mellitus are supposed to take in moderate amounts of fish and poultry, and rarely engage in meat eating, especially red meat. Patients with diabetes are therefore supposed to take in protein rich diets but must ensure fish is their chief protein source, followed by poultry and seldom consume red meat (Ley et al., 2014; Wallin, Orsini, Forouhi, & Wolk, 2018). Almost all the participants of the present study said that they have been educated to avoid or rarely consume meat. They also indicated they have been told to resort to fish as their main source of protein, and also take in moderate amounts of poultry. In addition, the participants recounted that they have been told to always add protein to their diet. The participants of the current study were therefore knowledgeable on the importance of taking in protein, and the healthy protein sources to consume. These findings resonate with a study carried out by Senadheera et al. (2016) among patients with diabetes which showed that, the majority of the participants knew fish is the main animal protein they need to take, followed by chicken, and also drastically reduce their intake of meat to avoid increasing their lipid levels.

### **5.1.3 KNOWLEDGE ON HEALTHY EATING**

The findings of this study revealed that, all the participants recounted the need for them to limit their intake of foods and be cautious of the amount of foods they eat. They knew that will keep their blood glucose levels in check, and help them to be in optimal health. Some of them talked about the fact that they have been told to usually take foods the size of their closed fists,

limit their intake of foods such as plantain to two to three fingers, and restrict their intake of foods such as soup, rice, porridge, oats, and wheat to a certain number of ladles. It was evident from the participants' accounts that they were very clear and not confused about the quantity of foods they were supposed to eat. They therefore expressed confidence in not eating too much and not going contrary to what they have been told by the health care workers with regards to the quantity of foods to eat. It is worth noting that, none of the participants of this study expressed any concern about having issues with the quantity of foods to eat. Additionally, the participants of this study were knowledgeable on the need to avoid starvation in order not to experience hypoglycaemia. The findings of this study partly concur with the findings of other studies conducted by Lawrence et al. (2017), Uchenna et al. (2010), and Doherty et al. (2014) among patients living with diabetes mellitus which found that, the participants were knowledgeable on the need to keep in check the quantity of foods they eat per the education they had been given by their health care providers. Nonetheless, the participants of these studies also indicated that they were confused about the right amount of foods to take and were unable to determine the appropriate sizes or quantities of foods to take. The studies again highlighted that, the participants had a poor understanding of the actual quantity of foods to take since their health care providers generally told them to limit the amount of foods they eat or to be cautious of the amount of foods they eat, without explicitly giving them specific instructions on the actual quantity of foods to eat. The poor understanding of the participants of the above studies on the amount of foods to eat and the seemingly inadequate health education they received on the amount of foods to eat may have resulted in the contrasting findings between the studies and the current study.

Skipping of breakfast is an unhealthy eating habit which has dire consequences on the health of individuals. The importance of regular breakfast intake by patients with diabetes cannot

be overemphasized (Mekary et al., 2013; Mekary, Giovannucci, Willett, van Dam, & Hu, 2012). Research studies have established that skipping breakfast results in increased blood glucose levels, increase in body weight, and increased risk of cardiovascular diseases. Maintenance of body weight and keeping blood glucose levels within healthier ranges for patients living with diabetes is foundational in optimal self-management of diabetes mellitus. This underscores the need for patients living with diabetes mellitus to be knowledgeable on the need to ensure regular breakfast intake to achieve improved quality of life (Kobayashi et al., 2014; Rong et al., 2019). Additionally, in order for patients living with diabetes to successfully engage in healthy eating, they need to take breakfast, lunch, and supper everyday. Optimal nutritional management of diabetes therefore enjoins patients living with the condition to eat three times a day, that is, breakfast, lunch, and supper (Jakubowicz et al., 2015; Ono, Kamoshima, Nakamura, & Nomoto, 2014). The findings of this study highlighted the adequate knowledge level of most of the participants on the need to eat three times a day, that is, breakfast, lunch, and supper, as well as avoid late night eating, and skipping breakfast in order to enhance their health and well-being. This is in consonance with a study conducted in 2015 among patients living with diabetes in Mauritius which revealed that the majority of the participants were knowledgeable on the need to avoid skipping breakfast, as well as the need to take lunch and supper in addition to breakfast everyday (Ruhee & Mahomoodally, 2015). The findings are also in tandem with another study conducted in Ghana which asserted that, patients living with diabetes mellitus are knowledgeable on the need to eat their dinner early and avoid late night eating due to its negative effects on their health (Obirikorang et al., 2016).

Though patients living with diabetes mellitus need to drastically reduce or avoid taking in refined sugar and sugary products, they are nonetheless supposed to resort to increased intake of refined sugar and sugary products such as soft drinks when they experience hypoglycemia in order

to raise their blood glucose levels (Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, 2013). The findings of the present study revealed that a few of the participants have been told by the health care providers to take in sugar or soft drinks such as Coca-Cola when their blood sugar level drops in order to boost their glucose levels. Some of the participants mentioned sweating, discomfort, body shaking, and anxiety as some of the manifestations that indicate to them that their blood glucose levels have dropped, while others mentioned relying on their blood glucose level readings after checking it with a glucometer to determine if their glucose levels have dropped. These findings resonate with the findings of other studies conducted among patients living with diabetes by Bohme et al. (2013) and Savard et al. (2016) which revealed that, patients with diabetes mostly rely on signs and symptoms such as sweating, body shaking, and anxiety to determine their hypoglycemic status, after which they increase their intake of refined sugars, sugary products, and snacks to increase their blood glucose levels. The participants of these studies also highlighted the need for them to avoid these products when their blood glucose levels are not low to avoid pushing their glucose levels above the healthy range. The studies by Bohme et al. (2013) and Savard et al. (2016) also showed that the majority of the participants usually experience hypoglycemia and had even gotten hypoglycemia recently, but the current study did not look into that. In addition, Savard et al. (2016) established in their study that many patients with diabetes overeat their hypoglycemia episodes. These findings suggest that there is the need to further explore the knowledge, experiences, and practices of patients with diabetes in Ghana on hypoglycemia.

#### **5.1.4 SOURCE OF KNOWLEDGE ON DIABETES MANAGEMENT**

Today's modern world has made it possible for patients with diabetes to have access to countless sources through which they can obtain health information. Traditionally, health care

workers have been the prime source of knowledge on health conditions for patients through health education. However, the scope has now broadened to include radio, television, friends, family members, and the internet. These varied sources of information however raises the issue of quality, consistency, and reliability of the information offered. Hence, in as much as patients living with diabetes mellitus now have several sources to seek knowledge from, the different and conflicting information usually given by each source also puts them in a confused state (Lawrence et al., 2017; Longo et al., 2010). The findings of the present study asserted that the participants chiefly rely on instructions received from doctors, dietitians, and nurses as their main source of knowledge for proper self-management of their condition. All the participants echoed being directed by their attending doctors at the out-patient department to dietitians, before they were sent to the diabetic clinic which is also run by nurses and doctors who regularly educate them and give them medical care. Also, the participants expressed satisfaction with the education and medical care rendered to them. None of them mentioned having inadequate knowledge or receiving poor education on the management of diabetes mellitus. A few of the participants however mentioned resorting to the internet, radio, and television for additional information on their condition. These findings are in consonance with the findings of another study conducted among patients with diabetes which indicated that, the participants of the study mainly relied on doctors, nurses, and dietitians for information on how to manage their condition, but some of them additionally resorted to the internet, television, and radio for more information on how to manage their condition. The participants also echoed their confidence in the education given to them by the health care providers (Longo et al., 2010). Unlike the findings of the current study, the participants of the study conducted by Longo et al. (2010) said that they also got information on diabetes from diabetes educators, pharmacists, and from reading newspapers. These findings indicate that there

is the need to sensitize the print media in Ghana to give more opportunities to health care providers and experts to write articles on the prevention and management of diabetes to serve as a source of information for people living with diabetes and those who do not have the disease. Radio and television can also be strategically utilized to render health education on diabetes mellitus to patients with the condition and the general populace as a whole. In addition, the involvement and roles of other health care providers in Ghana need to be assessed and researched into, since it appears only nurses, dietitians, and doctors are the ones who are mainly involved in the care and management of patients with diabetes.

## **5.2 MOTIVATION TO UNDERTAKE NUTRITIONAL MANAGEMENT OF DIABETES**

The participants of this study mentioned intrinsic and extrinsic factors as their source of motivation in undertaking optimal nutritional management of their condition. This study therefore defined motivation to encompass intrinsic motivation and extrinsic motivation. This is similar to a study conducted in Jordan among patients living with diabetes which revealed that the participants alluded to intrinsic motivation and extrinsic motivation as key to proper management of their condition (Al-Hassan, Al-Akour, & Aburas, 2017).

### **5.2.1 INTRINSIC MOTIVATION**

Intrinsic motivation is one of the means of motivating patients with diabetes. Intrinsic motivation refers to the engagement in an activity by an individual to bring pleasure to one's own self or to gain certain benefits for one's own self (Tay, Drury, & Mackey, 2014). It has been documented that people who are motivated intrinsically achieve better health outcomes than those who are motivated by any other means. Also, it has been established that intrinsic motivation is significantly associated with better glycemic control and improved quality of life. This is because

intrinsic motivation increases the desire, determination, and confidence of people living with diabetes to adhere to their treatment regimen and comply with the health education given them (Al-Hassan et al., 2017; Delamater et al., 2017). The findings of this study indicated that the majority of the participants were intrinsically motivated to undertake optimal nutritional management of their condition. This concurs with a study conducted among patients living with diabetes mellitus in Norway which revealed that the majority of the participants were intrinsically motivated to engage in healthy eating (Oftedal, Bru, & Karlsen, 2011). Also, the findings of this study posited that most of the participants opined the desire to live long, the desire to be in good health, and the desire to prevent worsening of diabetes as their intrinsic motivational factors. These findings are in consonance with the findings of studies conducted among patients with diabetes in England and Denmark which revealed that the participants mentioned the desire to be in good health, the desire to live long, and the prevention of complications of diabetes as the intrinsic motivational factors that enable them to engage in healthy eating and exercise (Lidegaard, Schwennesen, Willaing, & Færch, 2016; Sebire et al., 2018). The present study also found that the intrinsic motivation of one female participant was to prove that diabetes mellitus can be cured with a healthy lifestyle, a finding which was absent in the studies conducted in England and Denmark. This finding suggests that there is the need for further studies to be conducted on the beliefs of patients with diabetes in Ghana to determine if there is widespread belief that diabetes can be cured.

### **5.2.2 EXTRINSIC MOTIVATION**

Extrinsic motivation has also been found to be key in ensuring healthy eating or proper nutritional management among patients living with diabetes mellitus. Therefore, in order to ensure proper nutritional management of diabetes mellitus, extrinsic motivation of patients living with

diabetes need to be given serious attention by health care providers (Ofstedal et al., 2011). Extrinsic motivation refers to the engagement in an activity by an individual to please someone, for the benefit of someone else, or in order to gain or receive a reward (Deci & Ryan, 2015). The findings of this study asserted that, some of the participants were extrinsically motivated. The participants mentioned two extrinsic motivational factors that drive them to engage in proper nutritional management of their condition. The main reason is to be able to take proper care of their children for them to become better placed in society. It is worth noting that, five participants cited this reason of which four were females. This finding is consistent with the findings of studies conducted among patients diagnosed of gestational diabetes which showed that, the participants were mainly motivated to engage in healthy eating despite its challenging nature because of their babies. They therefore prioritized the health and well-being of their babies above theirs, and that extrinsic motivator was their main source of motivation for engaging in healthy eating (Bandyopadhyay et al., 2011; Carolan, Gill, & Steele, 2012; Tierney et al., 2015).

The findings of the present study also revealed reliance on God and prayers as the other extrinsic motivator that was echoed by a few of the participants as what drives them to engage in healthy eating. This is partly in line with the findings of a study conducted by Bhattacharya (2013) among African Americans with diabetes mellitus which highlighted reliance on God and prayers as key motivators for the participants of the study. The study also showed that the participants considered these motivators as coping mechanisms that enable them to face and overcome difficult situations in their lives, including the challenges associated with diabetes self-management. Additionally, the participants of the African American study said that reliance on God and prayers will ultimately make them better and even heal them of their disease. It is still not clear or fully established how reliance on God and prayers enable patients with diabetes to engage in healthy

eating and to be in good health. Further research in this area may be needed to unravel and understand the complexities associated with that perception and belief.

### **5.3 SUPPORT SYSTEMS RELIED ON IN THE CARE AND MANAGEMENT OF DIABETES**

Support systems are mediums or groups that provide consistent and reliable assistance to patients to help them in the care and management of their diseases. The assistance can be in the form of motivation, education, monetary support, as well as lending a helping hand to the patient in his or her care and management duties or activities (Ahola & Groop, 2013). It has been found that support systems are significantly associated with healthy eating, drug compliance, regular exercising, better glycemic control, improved quality of life, and the development of optimal diabetes management skills among patients living with diabetes mellitus. This underscores the importance of finding out the support systems that enable patients living with diabetes mellitus to undertake optimal nutritional management of their condition (Tang, Brown, Funnell, & Anderson, 2008). The participants of this study mentioned five support systems that have helped them in the care and management of their condition.

#### **5.3.1 MEDICAL SUPPORT**

The participants of this study mentioned that the doctors, nurses, and dietitians at the Korle-Bu Teaching Hospital have been their primary source of support in terms of educating them on the condition, providing medical care to them, as well as motivating them. These findings resonate with the findings of another study which posited that health care providers such as doctors, pharmacists, dietitians, nurses, diabetes educators, and psychologists are one of the most important support systems for patients living with diabetes due to the crucial roles they play in educating,

motivating, and providing medical care to patients with diabetes, as well as supporting them to overcome the varied challenges that prevent them from engaging in optimal self-management of their condition (Powers et al., 2017). The above findings indicate that there is the need to deeply involve the other health professionals in Ghana in the care of patients with diabetes in the country. The findings of the current study partly concur with the findings of a study conducted in the United States of America among patients with diabetes in which the participants said that, the health care providers were their main source of knowledge on diabetes management, but they played no role in motivating them to engage in optimal diabetes management. The participants added that they were rather motivated by diabetes peer support groups (Chlebowy, Hood, & LaJoie, 2010). It is imperative for health professionals to always perform all their key roles in the care of patients with diabetes, and avoid neglecting their responsibilities in order to ensure optimal self-management.

### **5.3.2 SUPPORT FROM FAMILY**

The findings of this study revealed that apart from the support of health care providers, the majority of the participants mentioned support from their families as their key support system. The participants mentioned that their family members motivate them, support them financially, help them in food preparation, help them in the purchase of foods, and ensure that they stick to the instructions given them on healthy eating. This is in tandem with a study conducted among patients with diabetes which revealed that, the participants cited family support as their key support system, and added that their family members motivate them, offer financial support for them, buy food for them, help them in food preparation, and ensure they abide by the dietary instructions given them by their health care providers (Vongmany, Lockett, Lam, & Phillips, 2018).

### **5.3.3 SPIRITUAL SUPPORT**

Various research studies have posited that religiosity and spirituality are key support systems in diabetes management. There is therefore the need for health care providers to make use of and enhance all the support systems of patients living with diabetes including that of spirituality and religiosity to ensure patients achieve positive health outcomes (Gupta & Anandarajah, 2014; Watkins, Quinn, Ruggiero, Quinn, & Choi, 2013). A few of the participants mentioned spiritual support as part of their support systems in the care and management of their condition. The participants mentioned reading of their Bibles, and having faith, hope, and belief in God, in addition to prayers as what enable them to cope with their condition. This is not surprising due to how religious Ghanaians are, and how most Ghanaians bring God into whatever they do, and relate whatever happens to them to God. These findings are similar to the findings of other studies conducted among patients with diabetes which showed that, the participants mentioned prayers, Bible reading, Quran reading, reliance on God, and having faith, hope, and belief in God as a major support system in the care and management of their condition (Casarez, Engebretson, & Ostwald, 2010; Gupta & Anandarajah, 2014; Namageyo-Funa, Muilenburg, & Wilson, 2015; Singh, Cinnirella, & Bradley, 2012; Smith, 2012). How these religious practices and beliefs provide support to the participants and enable them to engage in self-management, including optimal nutritional management of their condition is not clear. It may however be due to the inclusion of health teachings in their religious doctrines, which then provide them with health information and motivation to enable them manage their condition effectively (Korsah, 2015). It can therefore be said that, spiritual support indirectly helps patients with diabetes in the management of their condition. Hence, health care providers should take advantage of this support system and explore ways of incorporating it in the care of patients with diabetes (Korsah, 2015). Nonetheless, the role

and benefits of spiritual support in the management of diabetes need to be further explored to enhance its understanding.

#### **5.3.4 SUPPORT FROM FRIENDS**

Research works by Kadirvelu et al. (2012), Rosland et al. (2008), and Schiotz et al. (2012) have linked support from friends to healthy eating, regular engagement in exercise, compliance with drugs, and optimal self-management of diabetes mellitus among patients living with the condition. The findings of this study indicated that, a few of the participants mentioned friends as one of their support systems. These participants opined how helpful their friends have been in motivating them, and ensuring that they adhere to the instructions given them on healthy eating. The findings are in consonance with a study conducted among patients with diabetes in South Africa in which most of the participants echoed support from their friends as one of their key support systems. They added that their friends motivate them, ensure they opt for the healthy foods they have been asked to eat, and help them in monitoring their blood glucose levels (Visagie, van Rensburg, & Deacon, 2018). The findings also concur with research studies conducted among children and adolescents with diabetes in which the participants indicated support from their friends as critical to the successful management of their condition. They opined their friends motivate them, assist them to make healthy food choices, and help them to exercise regularly by exercising with them (Malik & Koot, 2012; Sparapani, Borges, Dantas, Pan, & Nascimento, 2012).

#### **5.3.5 DIABETES PEER SUPPORT GROUPS**

The introduction and facilitation of patients with diabetes into diabetes peer support groups by health care providers is an excellent way of providing the patients with an important support system even in the absence of support from friends and family members (Heisler, 2009). Diabetes peer support groups have been found to be beneficial in helping patients with diabetes to overcome

the varied challenges they face with diet, exercise, and drug intake (Lorig, Ritter, Villa, & Armas, 2009). A diabetes peer support group is a group made up of patients with diabetes who meet and share their knowledge and experiences on the management of their condition in order to educate, motivate, support, and equip themselves to be able to engage in optimal self-management of their condition and achieve improved quality of life (Lorig et al., 2009; Smith et al., 2011). Diabetes peer support also refers to the assistance or help an individual with diabetes renders to a patient or patients with diabetes by sharing with them his or her knowledge and experiences on diabetes and its management. With this definition, a diabetes peer support group can either be two individuals with diabetes sharing their knowledge and experiences on the condition or a group of people with diabetes sharing their knowledge and experiences on the condition (Dale, Williams, & Bowyer, 2012). This study revealed that twelve of the participants have not received any education on diabetes peer support groups and what they do. Three participants however said that they received education on diabetes peer support groups but they added that, they were not integrated into any such group by the health care providers who gave them the education. Out of the fifteen participants, thirteen of them appeared to have no or inadequate knowledge on diabetes peer support groups and the relevance of the groups. Moreover, all the participants of this study were not integrated into any diabetes peer support group, and none of them currently belongs to any such group. These findings contradict a study carried out among patients with diabetes in New Zealand which revealed that the participants were very knowledgeable on diabetes peer support groups, and the benefits associated with joining such groups such as enhancing one's knowledge and skills on diabetes management. The study also alluded to the fact that the participants have been well integrated into diabetes peer support groups, and they are active members of those groups (Simmons, Voyle, Rush, & Dear, 2010). The reason for the contrasting findings may be

due to the lack of knowledge or inadequate knowledge of the health care providers at Korle-Bu Teaching Hospital on diabetes peer support groups, their relevance, and the need to incorporate such groups in the care and management of patients living with diabetes mellitus. The findings of the current study buttress the findings of a study conducted by Kadirvelu et al. (2012) which highlighted that, health care professionals need to see to the formation of diabetes peer support groups, and incorporate the groups in the care and management of patients with diabetes by adequately educating patients about the groups and integrating them into the groups.

Nonetheless, some of the participants of this study also mentioned benefitting immensely from the knowledge and experiences of their fellow patients or peers with diabetes, and classified it as one of their support systems. The participants said that when they come for review at the diabetic clinic and they are waiting to be attended to by the health care providers, some of their fellow patients sometimes share their experiences and knowledge on the condition with them, and employ them to take good care of themselves or manage their condition well by adhering to the instructions given to them. The participants hailed this as a great source of motivation and knowledge for them, and added that they put into practice what they gain from the shared knowledge and experiences from their peers. This resonates with the findings of a study conducted by Fisher et al. (2012) among patients with diabetes which posited that, support from peers or fellow patients can equip and empower patients living with diabetes mellitus to engage in proper management of their condition. Fisher et al. (2012) again asserted that knowledge and experiences shared by patients with diabetes do not only enlighten and serve as a source of information for them, but it also serves as a source of motivation for them so that they can successfully engage in and sustain optimal self-management of their condition. Also, apart from the support of health care providers and the family members of participants, support from other patients with diabetes or

peers was the support most of the participants of the present study mentioned. This resonates with the findings of a study carried out by Chlebowy et al. (2010) among patients with diabetes which found that, the participants mentioned support from their peers with the condition as their third support system besides support from health care providers and family members. It is worth noting that, the generosity and good will on the part of some patients to share their knowledge and experiences on diabetes with their fellow patients was the only peer support some of the participants of the current study had. Though the participants opined not belonging to any diabetes peer support group, and having no or poor knowledge on such groups, some of them echoed benefitting from the support of peers who willingly shared their knowledge and experiences with them, which is also a form of diabetes peer support system.

#### **5.4 SKILLS/PRACTICES ON NUTRITIONAL MANAGEMENT OF DIABETES**

Adequate nutritional knowledge usually results in healthy dietary intake and practices. Similarly, when patients with diabetes possess adequate knowledge on the proper nutritional management of their condition, they often engage in healthy eating (Breen et al., 2015; Spronk et al., 2014). Under this theme, the participants mentioned their dietary practices in the morning, afternoon, and evening, as well as the skills they employ in reading food labels and planning meals.

##### **5.4.1 DIETARY PRACTICES IN THE MORNING, AFTERNOON, AND EVENING**

Under this sub-theme, the participants mentioned the number of times they often eat in a day, the foods they usually take during breakfast, lunch, and supper, as well as the quantity of foods they eat during each session. They also talked about the fruits they usually consume, and when they often consume them. In addition, they echoed their current practices on the intake of soft drinks and alcoholic drinks.

This study found that the majority of the participants said they usually eat three times in a day, that is, breakfast, lunch, and supper while a few of them opined they usually eat two times in a day. These findings are partly in line with the findings of a study carried out in Mauritius among patients with diabetes by Ruhee and Mahomoodally (2015) which showed that the majority of the participants (52.6%) usually eat three times in a day, that is during breakfast, lunch, and supper, while a few of them (9.4%) usually eat less than three times in a day, and some of them (38%) often eat more than three times in a day.

The importance of regular breakfast consumption, particularly, whole grains and cereal diets, or foods rich in fibre cannot be overemphasized due to its enormous health benefits. Several research works have associated regular breakfast consumption, particularly, whole grains and cereal diets or high fibre diets to healthy glycemic levels, healthy body weight, decreased risk of cardiovascular conditions and complications (Gibney et al., 2018; Iqbal et al., 2017). The findings of this study revealed that, the majority of the participants usually take corn porridge, millet porridge, oats, or wheat for their breakfast due to their high fibre content. The participants mentioned that they usually take these foods with either brown bread or wheat bread, and sometimes add vegetables such as carrots, lettuce, dandelion, onion, and tomatoes to their bread. Some of them also echoed that they sometimes add powdered milk or a cholesterol-free milk and non-nutritive sweeteners to the foods. In addition, most of the participants also indicated they usually take tea with brown bread or wheat bread as their breakfast. They indicated they usually add powdered milk or a cholesterol-free milk to the tea, and sometimes add vegetables or eggs to the bread. However, whereas four of them added that they sometimes add a non-nutritive sweetener to their tea, three of them said they usually add white sugar to their tea. Apart from these foods, the participants mentioned that they sometimes take heavy foods such as kenkey (a local Ghanaian

food prepared with corn) with fish and stew or vegetables, or boiled plantain with vegetable stew and fish, or rice with stew, vegetables and fish as their breakfast. From the analysis of the data, it appeared that all the participants are regular breakfast consumers. The findings of the current study highlighted that the foods the participants usually take as breakfast generally contain high amounts of whole grains, cereals, vegetables, milk, fish, and non-nutritive sweeteners, as well as low to moderate amounts of oils, legumes, fats, cholesterol, meat, sugars and refined sugars. In addition, the knowledge the participants have on the types of food to eat in the morning per the education they received appears to be consistent with their breakfast dietary practice. These findings corroborate with the findings of a study conducted among patients with diabetes in Mauritius which showed that their breakfast usually contain high amounts of vegetables, fish, and milk (Ruhee & Mahomoodally, 2015). The findings also concur with another study conducted in the United States of America which found that the participants usually consume high amounts of vegetables, and low amounts of sugar and refined sugar during breakfast (Andaya, Arredondo, Alcaraz, Lindsay, & Elder, 2011). Unlike the findings of this current study where all the participants indicated that they are regular breakfast consumers, studies conducted by Fayet-Moore et al. (2019) in Australia, Barr et al. (2013) in Canada, as well as Gibson and Gunn (2011) in United Kingdom found that, only 88%, 89%, and 78% of the participants respectively were regular breakfast consumers. Additionally, the studies also indicated that out of the regular breakfast consumers, only 41%, 20%, and 35% of the participants respectively were consuming breakfast diets which were high in whole grains, cereals, and dairy, and low in fats and refined sugars. Though the studies conducted in Canada and United Kingdom did not give reasons for the participants' breakfast choices and preferences, the Australian study posited that the participants' regular breakfast consumption and their consumption of breakfast diets rich in whole grains,

cereals, and dairy were associated with their higher socioeconomic status, increasing age or adulthood, and their practice of healthy lifestyles. The current study did not consider the socioeconomic status of its participants, however, all the participants were adults and generally had a healthy lifestyle due to their adequate knowledge on the nutritional management of their condition, and they also appeared to be financially sound. Though the reasons for the contrasting findings between the studies are not clear, it seems the participants of the current study's increasing age, healthy lifestyles, and adequate knowledge on the nutritional management of their condition may have accounted for the different findings. The findings of the present study also revealed that the participants usually have their breakfast anytime from 6am to 10am everyday. This is in tandem with a study conducted in the United Kingdom which showed that the participants usually have their breakfast from 6am to 10am daily (Gibson & Gunn, 2011).

Regular intake of lunch enables patients living with diabetes mellitus to have healthy body weight and healthy blood glucose levels. This underscores the need for patients with diabetes to be regular lunch consumers in order to achieve positive health outcomes (Kahleova et al., 2014). The findings of the present study brought to light most of the participants are regular lunch consumers, and they usually consume heavy foods during lunch. This is congruent with the findings of a study carried out to ascertain the eating habits of adolescents in the United States of America which found that, the majority of the participants were regular lunch consumers (Matheson et al., 2012). The majority of the participants of this study also said that they usually take fufu (a local Ghanaian diet) with light soup or palm nut soup or groundnut soup as their lunch. The participants echoed that they prepare their fufu with just plantain or with cassava and plantain. They added that they usually take it with fish, but sometimes take it with chicken, and rarely take it with meat. Some of them also opined that they keep the oil they consume in check. Most of the

participants also indicated that they usually take boiled plantain with fish and vegetable stew as their lunch. However, they added that they sometimes opt for eggs instead of fish, and also consume boiled yam instead of boiled plantain sometimes. Some of the participants mentioned rice with stew and fish as the food they sometimes have for lunch. However, they indicated that they sometimes take it with egg or chicken instead of fish, but only take it with meat once in a while. Kenkey (a local Ghanaian diet prepared with corn) with fish and okro stew or pepper, tomatoes, and onion was the food of choice for some. For others, they mentioned banku (a local Ghanaian diet prepared with corn and cassava) with soup or okro stew and fish or sometimes chicken as what they take for lunch, while some mentioned rice balls with soup and fish or chicken as the food they sometimes take as their lunch. From the accounts of the participants, they usually consume low amounts of meat, high amounts of staple foods, vegetables, and fish, as well as moderate amounts of eggs, chicken, cereals, legumes, oil, and whole grains during lunch. These findings resonate with the findings of a study conducted in China by Li et al. (2017) which showed that people who regularly take lunch often consume increased amounts of vegetables. The findings of the current study also corroborate with other research studies conducted among children and adolescents in Denmark which found that the lunch of the participants contained more vegetables (Fagt et al., 2007; Pedersen, Meilstrup, Holstein, & Rasmussen, 2012). The findings of the present study are also partly in line with an African American study by Griffith et al. (2013) which showed that the participants usually consume moderate amounts of whole grains, poultry, dairy products, and vegetables during lunch. However, in contrast to the present study's findings, the African American study revealed that the participants often consume high amounts of fats, oils, cholesterol, meat, sugars, and refined sugary products, as well as low or rare amounts of fish and cereals during lunch. The study by Griffith et al. (2013) posited that, the participants' choice of foods for lunch

was premised on foods which were easily available, convenient, handy, and within reach because of their work demands and busy schedules. The study again asserted that, the participants considered their work, busy schedules, and ability to meet the needs and commitments of their families as more important than their nutritional requirements as patients with diabetes. These reasons may have resulted in the different findings that emerged from the current study.

Irregular supper intake and late night eating among patients with diabetes lead to poor glycemic control (Sakai et al., 2017). The findings of this current study indicated that, the participants were regular supper consumers who usually eat their supper early and avoid late eating. From their accounts, they usually have their supper between 4pm and 7pm, but the foods they usually take as their supper are not different from the ones they usually take as lunch. These findings are partly in line with the findings of studies by Sandhu and Tang (2016), and Sakai et al. (2017) which also found that the majority of the participants were regular supper consumers who avoid late night supper eating by usually having their supper before 8pm. Most of the participants of the present study mentioned that they usually take fufu and light soup or groundnut soup or palm nut soup with fish. Some of them added that they sometimes add meat to the food. The participants recounted that they prepare their fufu with only plantain or with cassava and plantain. Some of the participants opined that they sometimes take the following foods as their supper, boiled plantain with vegetable stew and fish, or banku with stew or vegetables and fish, or kenkey with pepper and fish, or rice with stew and fish, or boiled yam with vegetable stew and fish. Though the participants said that they usually avoid late eating, they added that they have been told to eat light foods and avoid starving themselves if they feel hungry later in the evening after consuming their supper. The participants therefore echoed that they take corn porridge, millet porridge, oats, tea, or fruits when they are hungry in the night after consuming their supper. They

added that, they usually do not add milk, sugar, non-nutritive sweeteners, biscuit, or bread to the light foods they eat at that time. Generally, the findings of this study revealed that, the foods the participants usually take as their supper contain high amounts of vegetables, whole grains, fish, roots and tubers, moderate amounts of legumes, cereals, fats and oils, and low or rare amounts of meat, poultry, and dairy products. In contrast, a study conducted by Sato-Mito et al. (2011) among young women in Japan found that, the foods they usually consume during supper contain high amounts of meat, refined grains, fats, sweets, oils, refined sugars, and low amounts of vegetables, whole grains, cereals, fruits, milk and milk products. The Japanese study also showed that the participants usually engage in late night supper eating, and resort to the consumption of fast foods, sweets, sugary drinks, and refined grains when eating at that time. The reason for the contrasting findings may therefore be due to the choice of foods the participants of both studies opt for during supper. Also, the sources of carbohydrates contained in the local Ghanaian diets the participants of the current study usually consume may have accounted for the different findings.

The participants of this study clearly exhibited no confusion on the amount of foods they are supposed to eat, and were therefore consistent on the quantity of foods they take for breakfast, lunch, and supper. From their accounts, they were putting into practice the knowledge they gained from the health education given them by their health care providers. Generally, they opined that they usually scoop a specific number of ladles when taking porridge, oats, wheat, soup, and rice. They take a specific number of slices of bread or a particular size of bread, they consume just a ball of foods such as kenkey, banku, fufu, and rice balls whose size is as their closed fists. They eat specific fingers of plantain, specific slices of yam, and take a cup of tea. Also, they indicated that when they are buying these foods from food vendors, they only buy one cedi, or two cedis, or fifty pesewas worth of these foods so as to avoid overeating. These practices were generally in line

with the education given them on how to keep in check the quantity of foods that they eat. These findings are contrary to a study carried out by Uchenna et al. (2010) among patients with diabetes in Nigeria which showed that the participants were unable to estimate the recommended quantity of foods to eat and were therefore eating inappropriate sizes of foods despite receiving education on the quantity of foods to eat from their health care providers. The Nigerian study nonetheless indicated that, the participants had a poor understanding of the actual quantity of food to take since they were told to generally cut down on the amount of food they eat without receiving any specific instructions on the actual amount of food to eat. Therefore, the lack of clear instructions from the health care providers of the participants of the Nigerian study, as well as the seemingly poor health education ability and skills of the health personnel in Nigeria may have resulted in the different findings between that study and the current study.

Apart from the breakfast, lunch, and supper that the participants usually take, they also mentioned that they take in fruits regularly. From their accounts, it appears that they usually take fruits as their snack. The majority of them opined they usually take fruits in the evening, while some of them said they usually take it in the afternoon, and a few of them echoed that they usually take it in the morning. It seems that the participants consume high amounts of fruits in the evening, moderate amounts in the afternoon, and low amounts in the morning. The common fruits that the participants usually take are orange, banana, pawpaw, and mango, coconut, pineapple, apple, and pear. This is similar to the findings of another study conducted among patients with diabetes in another part of Ghana which found that the participants were regular fruit consumers, and were taking fruits throughout the day as their snack. The participants also mentioned banana, mango, orange, apple, pear, watermelon, and pineapple as the common fruits they usually consume (Doherty et al., 2014).

Patients living with diabetes mellitus need to limit their intake of sweets and soft drinks in order to avoid increasing their lipid levels and blood glucose levels (Zanchim, Kirsten, & De Marchi, 2018). The findings of this study posited that the majority of the participants currently take soft drinks occasionally and in moderation to keep their blood glucose levels in a healthy range. However, a few of them said that they have stopped consuming soft drinks to avoid raising their glucose levels. These findings are in line with a study carried out in Brazil among patients with diabetes which found that, the majority of the participants consume soft drinks occasionally and in moderation to avoid increasing their blood glucose levels (Zanchim et al., 2018).

Excessive consumption of alcohol has been found to be significantly associated with obesity and poor health outcomes in patients living with diabetes (Yoshimura et al., 2012). The results of this study found that the majority of the participants do not take alcohol. However, two male participants mentioned that they take alcohol, but they take it occasionally and in moderation. This implies that the participants adhere to the health education on alcohol intake that was given to them by their health care providers by refraining from excessive alcohol intake. The findings of this study resonate with the findings of a study conducted among patients with diabetes in Denmark in which the majority of the participants opined they have not taken alcohol within the past year (Jakobsen et al., 2016). Though many research studies have established that patients with diabetes should consume moderate amounts of alcohol, some research works also emphasize that patients with diabetes should totally refrain from consuming alcohol because of the risks and negative effects of moderate alcohol consumption on health outcomes and causing other diseases (Baliunas et al., 2009). For example, it has been documented that when patients with diabetes consume alcohol and do not eat on time, it can cause their blood sugar levels to drop significantly and make them experience hypoglycaemic episodes (Turner, Jenkins, Kerr, Sherwin, & Cavan, 2001). It

appears that it is safe for patients with diabetes to avoid consuming alcohol even in moderation because the health benefits associated with abstinence tend to outweigh the benefits associated with moderate alcohol consumption in the management of diabetes (Baliunas et al., 2009). The findings of the present study are also congruent with the findings of studies carried out by Yoshimura et al. (2012) and Ewers et al. (2018) which respectively showed that, men with diabetes consume alcohol more than women with diabetes, and patients with diabetes often consume only moderate amounts of alcohol because of their condition.

#### **5.4.2 READING OF FOOD LABELS**

The findings of this study revealed that, the majority of the participants (8) received education from the health care providers on the need to read food labels, while two other participants mentioned receiving education on the need to read food labels not from the health care providers but from the media, that is, television and radio. The rest of the participants (5) also indicated they did not receive any education on the reading of food labels from the health care providers or from any other source. Therefore, ten participants received education on the reading and usage of food labels from the health care providers and the media while five participants mentioned not receiving any education on food labels. Out of the ten participants who received education on food label usage from the health care providers and the media, seven of them indicated that they were only told to check the expiry dates of processed foods, and that is what they usually do when they purchase processed foods. Two participants said that they were told to check both expiry dates and manufacturing dates on food labels and that is what they usually do when they buy packaged foods, while one participant indicated he was told to check for both the expiry date and sugar content of packaged foods, and that is all that he does when he buys packaged foods. Also, out of the five participants who did not receive education on the use of food labels,

one female participant echoed that she usually checks the expiry date and sugar content of all packaged foods before she buys them because of her condition, while the other four participants mentioned that they do not use food labels or check anything when they buy packaged foods. Research studies have however established that, proper understanding and usage of food labels involves the ability of patients with diabetes to consider the amount of sugar, fibre, energy, fat, and salt on packaged foods before buying and consuming them (Spronk et al., 2014). On the contrary, the participants of this study restricted their food label reading to largely checking expiry dates, as well as checking the sugar content and manufacturing dates of packaged foods. The findings of this study are however in line with the findings of a study carried out in United Arab Emirates in which the participants mentioned that expiry date is the most important thing they check on a food label, followed by the manufacturing date of the food product (Washi, 2012). These findings also partly resonate with the findings of another study conducted in Ghana to assess consumers' awareness and use of food labels, in which the participants opined the most important thing they check on food labels is the expiry date of the product they are buying, followed by the salt content, the sugar content, and the fat content of the product (Ababio, Adi, & Amoah, 2012). Additionally, the findings of the current study partly corroborate with the findings of a study carried out in South Africa in which the participants indicated that, the expiry date of packaged foods is what they usually check on food labels, followed by the fat and cholesterol content of the food products (Jacobs, de Beer, & Larney, 2010). In contrast to the findings of the studies by Ababio et al. (2012) and Jacobs et al. (2010), the participants of this present study never mentioned checking the salt content, fat content, and cholesterol content on the food labels of packaged foods. The differences in the findings may be due to the type of health education on nutrition labels the participants of the various studies received from their health care providers. Generally, the findings

of this study revealed the deficient knowledge and skills of the participants as well as their health care providers on the reading and usage of food labels. However, the findings appear to support the assertion that, there is a positive association between nutritional knowledge and food label usage as all the participants (10) who received education on food label reading and usage admitted that they often put into practice what they were told to check when they are buying packaged or processed foods.

#### **5.4.3 MEAL PLANNING**

A meal plan is a guideline patients with diabetes and other conditions are given by health care providers to enable them engage in healthy eating. Therefore, health care professionals should not restrict patients with diabetes to eating a particular diet or a group of diets because of meal planning. Meal planning is individualized, and hence, guidelines to it must be tailored to fit the needs of each patient. Meal planning guidelines are geared towards enabling patients with diabetes to eat a variety of foods, consume quality and healthier carbohydrates, fats, and protein, as well as keep the quantity of foods they eat in check without necessarily measuring or weighing foods, and estimating the percentages or total amounts of carbohydrates, fats, and protein they eat daily. This is due to the overwhelming evidence on the need for patients with diabetes to channel their energies into consuming quality and healthier carbohydrates, fats, and protein other than concentrating on the total amount of carbohydrates, fats, and protein they take daily. Patients with diabetes undertake meal planning by deciding in advance the types of food they want to eat the following day or in the next couple of days (Ducrot et al., 2017; Gray, 2015). In addition, meal planning skills involve the ability of patients with diabetes to eat regularly and avoid skipping meals, avoid the excessive consumption of snacks in between meals, eat recommended quantity of foods, and focus on the intake of healthy sources of carbohydrates, fats, and protein when eating (Ulrich &

Abner, 2010). The findings of this present study revealed that the participants usually plan their meals by deciding in advance the foods they intend to eat in the subsequent days, and by adhering to the instructions given them on healthy eating habits, the recommended foods to eat, as well as the quantity of foods to eat. These findings are similar to the findings of a study conducted among adults in France which showed that the majority of the participants usually plan their meals by determining in advance the foods they will eat in the coming days, as well as engaging in healthy eating (Ducrot et al., 2017). The findings of the current study also resonate with findings of other studies conducted among patients living with diabetes mellitus in Tanzania and Ethiopia which found that, the majority of the participants usually plan their meals by engaging in healthy eating plans and adhering to optimal nutritional management of their condition (Kamuhabwa & Charles, 2014; Sorato, Tesfahun, & Lamessa, 2016). These findings however contradict a study carried out among patients with diabetes in Saudi Arabia by Badedi et al. (2016) which found that the majority of the participants do not follow a meal plan, mainly because of their busy schedules, job demands, desire to make more money, and commitment to other pressing needs of life which they deem far more important than their dietary health. The differences in the commitment of the participants of this present study and the study conducted in Saudi Arabia on their health and how they value their health may have accounted for the contrasting findings.

## **5.5 CHALLENGES TO ADHERENCE OF OPTIMAL NUTRITIONAL MANAGEMENT OF DIABETES**

Despite research works touting optimal nutritional management as pivotal in the care and management of diabetes mellitus, it has also been identified as one of the most difficult things patients with diabetes struggle to comply with. Patients with diabetes cite several reasons that

hinder them from engaging in optimal nutritional management of their condition. Therefore, identifying the barriers that sometimes prevent patients with diabetes who attend clinic at the Korle-Bu Teaching Hospital from engaging in healthy eating is critical in ensuring successful self-management (Broadbent, Donkin, & Stroh, 2011; Khattab, Khader, Al-Khawaldeh, & Ajlouni, 2010). This is because despite the participants of this study having adequate knowledge, motivation, and support to engage in optimal nutritional management of their condition, they still brought to light certain factors that sometimes prevent them from engaging in healthy eating. The current research identified five major barriers to optimal nutritional management of diabetes. The barriers include financial constraints, non-availability of preferred foods, loss of appetite, job demands, and appetite or desire for foods to avoid.

#### **5.5.1 FINANCIAL CONSTRAINTS**

A few of the male participants of this study cited financial constraints as a barrier that sometimes prevent them from engaging in healthy eating. They added that, the expensive nature of the healthy foods they have been advised to eat sometimes hinder them from buying such foods. These findings are similar to the findings of other studies conducted in Botswana, Portugal, Iraq, and Ethiopia respectively in which the participants who were patients with diabetes mentioned financial difficulties and/or the expensive nature of healthy foods as barriers that hinder them from engaging in healthy eating, and sometimes compel them to settle for unhealthy foods (Ganiyu, Mabuza, Malette, Govender, & Ogunbanjo, 2013; Laranjo et al., 2015; Mikhael, Hassali, Hussain, & Shawky, 2018; Tewahido & Berhane, 2017). The findings also corroborate with the findings of studies conducted among patients living with diabetes in Canada and South Africa respectively in which the participants mentioned that, the costly nature of healthy foods sometimes prevent them from going in for them, making them settle for unhealthy foods which are less costly and affordable

for them (Kulhawy-Wibe et al., 2018; Steyl & Phillips, 2014). In Ghana, husbands are the bread winners of their families, and are therefore supposed to provide for their families. Hence, family expenses are usually borne by husbands alone as opposed to wives who may not bear some of the cost per the cultural norms and traditions of the country. This may account for why only male participants cited this as a challenge taking into cognizance the varied family expenses they provide for to ensure their family members live comfortably.

### **5.5.2 NON-AVAILABILITY OF PREFERRED FOODS**

Some of the participants of this study revealed that, their challenge to adhering to the optimal nutritional management of their condition is the difficulty they sometimes encounter in getting healthy foods to buy and eat. They indicated that they are sometimes left with no other choice but to reluctantly settle for unhealthy foods due to the absence of healthy foods when needed. This finding is in tandem with the findings of various studies carried out among patients with diabetes in Barbados, Canada, and United States of America which found that, the participants opined eating unhealthy foods sometimes because of the absence of healthy foods within their reach or the limited access to healthy foods in their locality (Adams & Carter, 2011; Kulhawy-Wibe et al., 2018; Lee, Willig, Agne, Locher, & Cherrington, 2016; Purnell et al., 2016). The above findings are in consonance with a study that was carried out among African Americans who are at risk of Chronic Kidney Disease in which the participants cited unavailability of healthy foods in their neighbourhoods as a factor that prevents them from engaging in healthy eating (Johnson et al., 2014). These findings seem to suggest the need to increase accessibility to healthy foods in Ghana, as well as the need to formulate policies that will clamp down on the varied and easily accessible unhealthy foods that have spread across the country. The consumption of

unhealthy foods by patients with diabetes is likely to exacerbate their condition. It is a potential factor for the development of diabetes mellitus among individuals.

### **5.5.3 LOSS OF APPETITE**

Research studies have found that patients living with diabetes mellitus usually experience loss of appetite, which can lead to weight loss, starvation, hypoglycemia, high glycosylated hemoglobin levels, and an increased risk of diabetes complications (Scheuing et al., 2014; Toni et al., 2017). The findings of the current study revealed that, some of the participants cited loss of appetite as a barrier that sometimes prevent them from engaging in optimal nutritional management of their condition. The participants indicated that the loss of appetite sometimes make them undereat, which is an unhealthy eating habit that has dire consequences on their health. This concurs with a study conducted in Zimbabwe in which the participants mentioned loss of appetite as one of the barriers that sometimes prevent them from engaging in healthy eating. The participants added that, it makes them starve or eat a very small amount of food which they know affects their blood glucose levels negatively (Mukona, Munjanja, Zvinavashe, & Stray-Pederson, 2017). These findings are in line with the findings of other research studies which have posited that, patients with diabetes sometimes experience loss of appetite and decreased taste for foods which hinder them from engaging in healthy eating to have positive health outcomes (Jaworski et al., 2018; Rizvi, 2009).

### **5.5.4 JOB DEMANDS**

Three male participants also said that they sometimes engage in unhealthy eating because of their work demands. They mentioned that when they are very busy at their workplaces, they are sometimes unable to leave the workplaces to where they can get healthy foods to eat, thereby resorting to foods within their reach which may be unhealthy. These findings partly resonate with

the findings of other studies conducted among patients with diabetes in United States of America and Ghana respectively in which the participants cited job demands as a barrier that sometimes hinder them from engaging in healthy eating (Lee et al., 2016; Mogre, Johnson, Tzelepis, & Paul, 2019). Similarly, another study conducted among patients with diabetes found that, the participants mentioned work demands as a barrier that sometimes make them engage in unhealthy eating, miss their appointments with their health care providers, as well as prevent them from taking their drugs and monitoring their blood glucose levels (Cleal, Willaing, Stuckey, & Peyrot, 2019). These findings also fall in line with other research studies that have been carried out among patients with diabetes in South Africa, Zimbabwe, and Iraq, as well as West African immigrants with diabetes living in the United States of America, in which the participants recounted that their work demands prevent them from engaging in exercise as they have been asked to do. They indicated that they do not have time to exercise, and they are too busy to add exercise to their tight schedules (Abioye-Akanji, 2013; Mikhael et al., 2018; Mkonka et al., 2016; Steyl & Phillips, 2014). The high cost of living in Accra which is the capital of Ghana may be the reason why a few of the male participants cited this barrier, and seem to sometimes prioritize their work over their health in order to make enough money for themselves and their families.

#### **5.5.5 APPETITE/DESIRE FOR FOODS TO AVOID**

Three of the female participants indicated that even though they have been told by the health care providers to avoid eating certain foods, they still eat those foods because they like the foods. They however added that, they take those foods in moderation because of their condition and the education received so that it will not have any serious effect on their health. The findings of this study concur with other studies conducted among patients with diabetes in Portugal, Iraq, United Kingdom, South Africa, Zimbabwe, and the northern part of Ghana which showed that, the

participants cited difficulty in avoiding certain unhealthy foods they used to take before they were diagnosed due to their desire for those foods as a barrier that sometimes prevent them from engaging in optimal nutritional management of their condition. The studies also asserted that patients with diabetes sometimes find it difficult to let go of some unhealthy eating habits which can impact their health negatively (Booth, Lewis, Dean, Hunter, & McKinley, 2013; Ebrahim, De Villiers, & Ahmed, 2014; Laranjo et al., 2015; Mikhael et al., 2018; Mkonka et al., 2016; Mogre et al., 2019). Health care providers thus need to provide all the needed support, motivation, and skills patients living with diabetes mellitus require to undertake healthy eating in order to cushion them to be able to undertake this daunting task.

The next section focuses on the evaluation of the model used for the current study.

## **5.6 EFFECTIVENESS OF THE MODEL USED FOR THIS STUDY (INFORMATION-MOTIVATION-BEHAVIOURAL SKILLS MODEL)**

The Information-Motivation-Behavioural Skills (IMB) model served as the organizing framework for this study. The constructs of the IMB model were used to develop the research objectives for the study, as well as guide the review of literature, and organization of this study. The findings of the current study were consistent with the constructs of the IMB model.

Based on the constructs of the IMB model, the findings of this study revealed the knowledge level of the participants on optimal nutritional management of their condition, the factors that motivate them to engage in it, the support systems that enable them to engage in it, their current dietary practices and preferences, as well as the skills they employ to ensure optimal nutritional management of their condition.

Even though the IMB model does not address the challenges to healthy eating, the findings of this study revealed some challenges that sometimes hinder the participants from engaging in healthy eating such as financial constraints, non-availability of preferred foods, and job demands.

The above findings lend support to the assertion that, optimal nutritional management of diabetes mellitus does not solely depend on the knowledge level of patients with diabetes on healthy eating, but it also depends on how motivated they are to engage in healthy eating, as well as the skills and abilities they possess to be able to engage in it. This underscores the need for health care providers to include all these factors in the care and management of patients with diabetes, and not only focus on imparting knowledge on healthy eating to them, so that the patients may be able to undertake optimal nutritional management of their condition, and for them to have a successful self-management as a whole.

## **CHAPTER SIX**

### **SUMMARY, IMPLICATIONS, LIMITATIONS, CONCLUSION, AND RECOMMENDATIONS**

This chapter covers the summary of the study, the implications of the study, as well as the limitations, conclusion, and recommendations of the study.

#### **6.1 SUMMARY OF THE STUDY**

This study explored the knowledge on nutritional management of diabetes mellitus among patients with diabetes who attended clinic at the Korle-Bu Teaching Hospital. The IMB model served as the organizing framework for the study and guided the formation of the research objectives for this study. The IMB model posits that, healthy eating or proper nutritional management can only be manifested by patients with diabetes when they have adequate knowledge on healthy eating, when they have the motivation to engage in healthy eating, and when they have the needed nutritional management skills that rightly depict their ability to engage in healthy eating. This study therefore employed an exploratory descriptive qualitative research design to explore the knowledge of patients living with diabetes on the nutritional management of their condition, identify the factors that motivate patients living with diabetes mellitus to undertake nutritional management of their condition, and ascertain the behavioural skills patients living with diabetes mellitus employ in the nutritional management of their condition. Ethical approval from the NMIMR – IRB and KBTH – IRB were sought for and obtained before the study was carried out. Purposive sampling was used to recruit and interview participants after they had been told the details of the study, and had read and willingly signed or thumbprinted the consent form. Data

saturation was reached by the fifteenth participant. The interviews were audio recorded, and transcribed verbatim. Using thematic content analysis, four themes emerged in conformity with the research objectives for this study and the constructs of the IMB model. In addition, one theme emerged from the gathered data, outside the constructs of the IMB model using content analysis.

This study found that the participants were knowledgeable about the food whose consumption they needed to increase, decrease, or avoid in order to keep their blood glucose levels in a healthy range. This was due to the health education they had receive from their health care providers. The participants were also knowledgeable on the quantity of foods to take, the need to eat three times a day, and the importance of avoiding overeating and starvation. The study also found that the participants were engaging in unhealthy eating habits and had unhealthy lifestyles prior to the diagnosis of their condition, and this was largely due to their ignorance on the effects of those habits and lifestyles on their health.

In addition, the intrinsic and extrinsic motivational factors of the participants were identified, as well as the support systems that helped them to engage in successful nutritional management of their condition despite its challenges. Support from health care providers, support from family, support from friends, spiritual support, and diabetes peer support groups were the support systems that were mentioned by the participants. Despite the support systems playing key roles in the care of the participants, these systems were not integrated into the care and management of the participants' condition by the health care providers.

Furthermore, the study revealed the dietary practices and preferences of the participants. The study showed that the participants engaged in healthy eating even though they sometimes faced some challenges that served as stumbling blocks for them. The study also revealed that the

participants had adequate meal planning skills, but had deficient skills in food label reading and usage.

## **6.2 IMPLICATIONS OF THE STUDY**

The findings of this study have implications for nursing practice, nursing research, nursing education, and policy formulation which have been outlined below.

### **6.2.1 NURSING PRACTICE**

This study revealed that the participants were engaging in unhealthy eating habits prior to the diagnosis of their condition. They were not mindful of the types of food they were eating, and the times they were eating the foods. Most of them were also consuming soft drinks and sugary products excessively. They opined that they were not aware of the consequences of their engagement in those unhealthy eating habits until they were diagnosed of the condition. This implies that there is the need to intensify public health education on diabetes mellitus, highlighting the need for the populace to engage in healthy eating habits and healthy lifestyles to avoid getting the condition. Also, the management of Korle-Bu Teaching Hospital should organize seminars and workshops for the health care professionals on the nutritional management of diabetes mellitus, highlighting on the benefits of reading and using food labels, and how they can integrate diabetes peer support groups, as well as the families, friends, and spirituality of patients with diabetes into their care and management to help them achieve optimal health. In addition, health care providers at Korle-Bu Teaching Hospital should also offer tailor-made health education to patients with diabetes by recommending to them cheaper and equally healthy foods that are easily available to them in the vicinities in which they live and work to help curb the problem of non-compliance to healthy foods due to financial constraints and non-availability of preferred foods.

### **6.2.2 NURSING RESEARCH**

Further research studies on the nutritional management of diabetes mellitus can be carried out using a quantitative research approach to bring to bare the perspectives, knowledge, motivation, and practices of a large number of patients with diabetes on the phenomenon under study. Again, a quantitative research approach can also be used to determine the relationship between the variables of this study and the phenomenon under investigation. In addition, this research was carried out at the leading referral hospital in the country, which is situated in the nation's capital. Therefore, the varied high profile health care professionals and resources at the Korle-Bu Teaching Hospital, as well as the easy access to information including health information, health care settings, resources, variety of foods, numerous restaurants and eating places in Accra may have influenced the participants' knowledge, motivation, and practices on the phenomenon under study. Hence, further studies can be conducted at a hospital in a rural setting to bring to light the perspectives, knowledge, motivation, and practices of patients with diabetes on the phenomenon under investigation to determine if there will be differences and similarities in the findings. Also, this research could be conducted at multiple sites in order to generalize the findings.

### **6.2.3 NURSING EDUCATION**

The findings of this study revealed that the health care providers did not involve diabetes peer support groups, as well as the families, friends, and spirituality of patients with diabetes into their care and management despite its health benefits. Also, this study highlighted the inadequate health education the participants received from their health care providers on food label reading and usage, as well as the deficient skills of the participants on the reading and usage of food labels. These findings suggest that as part of the health training given to trainee nurses and midwives,

nursing and midwifery tutors and lecturers should incorporate and enhance the teaching of food label reading and usage, as well as the integration of social support systems into the care of patients with diabetes. As part of the health training, nursing and midwifery tutors and lecturers should also ensure that the trainee nurses and midwives acquire adequate skills in these two areas, and can successfully integrate them into the care and management of patients with diabetes. In addition, in-service training and seminars on integrating social support systems and food label reading and usage into the care of patients with diabetes can be organized for professional nurses and midwives to ensure they render the best of care to patients with diabetes in these two areas.

#### **6.2.4 POLICY FORMULATION**

The findings of this study showed that the participants were engaging in unhealthy eating, and excessively consuming soft drinks and sugary products prior to the diagnosis of their condition. Also, some of the participants cited non-availability of recommended foods and the costly nature of healthy foods as barriers that sometimes prevent them from engaging in healthy eating. This implies that the Government should enact a policy to curb the proliferation of soft drinks and sugary products on the Ghanaian market and its excessive consumption by imposing heavy taxes on the importation, production, and marketing of these products. This will increase the prices of these products, which may in turn help decrease its consumption by the citizenry. In addition, the Government should formulate a policy to encourage the opening and proliferation of diabetes-friendly restaurants and eating places by giving tax incentives to such restaurants and eating places to enhance the availability and accessibility of healthy foods to patients living with diabetes mellitus. The Government and regulatory bodies should also strictly monitor the numerous restaurants and eating places that sell unhealthy foods in the country in order to increase the chances of patients with diabetes and the citizenry in engaging in healthy eating. Furthermore,

the Government should develop a policy to increase the production, availability, and accessibility of healthy sources of carbohydrates such as vegetables, fruits, whole grains, cereals, and legumes in the country in order to increase the chances of patients with diabetes and the citizenry in engaging in healthy eating.

### **6.3 LIMITATIONS OF THE STUDY**

The translation of the interviews which were conducted in the local “Twi” language may have affected the specific meaning of some of the statements of the participants. Nonetheless, the researcher’s use of a translator, as well as the efforts by the researcher and the translator to use words or statements closest to the meaning of what the participants said helped to largely curb this problem. Also, this study was carried out at a hospital in the capital of Ghana where Christianity is the dominant religion and cultural beliefs are not so much entrenched due to the cosmopolitan nature of the city of Accra. Another study can therefore be conducted at the northern part of Ghana where the majority of the people living there are Muslims and cultural beliefs are deeply rooted in their social fabric, so that the findings can be compared to the findings of the current study to determine if the differences in cultural and religious beliefs may affect the responses of the participants.

### **6.4 HOW THIS RESEARCH HAS INFLUENCED THE RESEARCHER**

As a researcher and a nurse who interacts with patients with diabetes, I have now noted through this research that, the nutritional management of patients with diabetes is paramount and to a large extent affects their health outcomes. In my readings on the nutritional management of

diabetes from other sources, it has given me enough information on how to support patients with diabetes in particular. The readings have offered me new insight into diabetes care in terms of nutritional management. This research has also enhanced the researcher's ability to conduct qualitative research at the basic level. Initially, the researcher had challenges with how to organize basic research, but the experiences gathered from conducting this study has enabled the researcher to note the strategies of organizing a qualitative research, for example, how to organize a research using a model as an organizing framework.

## **6.5 CONCLUSION**

In line with the constructs of the IMB model, the findings of this study revealed the knowledge of the participants on the nutritional management of their condition, the factors that motivate them to engage in it, the support systems that enable them to engage in it, as well as the skills they employ and the practices they undertake in the nutritional management of their condition. The study also revealed the participants' challenges to optimal nutritional management of their condition, which was not in tandem with the constructs of the IMB model.

This study showed that the participants have adequate knowledge on healthy eating, as well as adequate motivation and support systems to engage in healthy eating. They also have adequate meal planning skills, and generally engage in optimal nutritional management of their condition due to their healthy dietary practices and preferences. This study also revealed that the participants have deficient knowledge and skills in the reading and usage of food labels. In addition, the study found that the participants have positive attitude towards the nutritional management of their condition despite citing some barriers that sometimes hinder them from engaging in healthy eating.

The findings of this study therefore lend support to the assertion that, patients with diabetes may be able to engage in optimal nutritional management of diabetes mellitus when they have adequate knowledge on healthy eating, when they are motivated to engage in healthy eating, and when they have the right skills and abilities to engage in healthy eating.

## **6.6 RECOMMENDATIONS**

The following recommendations have been made to the following institutions based on the findings of the study.

### **6.6.1 NURSING AND MIDWIFERY COUNCIL OF GHANA**

The nursing and midwifery council of Ghana should include in its curriculum how health care providers can integrate social support systems, as well as the skill of food label reading and usage into the care and management of patients with diabetes in order to improve the health and quality of life of patients with diabetes.

### **6.6.2 MINISTRY OF HEALTH**

The Ministry of Health should:

1. Embark on a nationwide campaign to enhance the health education of the citizenry on healthy eating habits and healthy lifestyles in order to help decrease the incidence of diabetes mellitus or prevent people from getting diabetes mellitus.
2. Ensure that all health care settings set up diabetes peer support groups, and provide the health care settings with the needed logistics and resources to ensure the proper functioning of these groups.

3. Organize workshops for health care providers on the reading and usage of food labels, as well as on the integration of social support systems into the care and management of patients living with diabetes mellitus to improve the health outcomes of the patients.
4. Liaise with the Ministry of Food and Agriculture to formulate a policy on the need for companies that manufacture processed and packaged foods in the country to also use the local languages on the food labels of their products in addition to the English language, in order to enhance the usage of food labels by people who cannot read the English language.
5. Embark on a nationwide health education campaign to educate the citizenry on how the families and friends of patients with diabetes can assist and support them in the care and management of their condition.
6. Collaborate with faith-based groups in the country and educate them on how they can assist and support their members who have been diagnosed of diabetes mellitus.

### **6.6.3 KORLE-BU TEACHING HOSPITAL**

The Korle-Bu Teaching Hospital should:

1. Organize seminars for the health care professionals on the nutritional management of diabetes mellitus, highlighting the need for them to tailor their health education on healthy foods to patients, based on the patients' socioeconomic statuses, as well as the accessibility of those foods.
2. Set up diabetes peer support groups and ensure effective running of these groups by providing the groups with all the needed resources and logistics.

3. Organize continuous professional development for the health care professionals on food label reading and usage, as well as the integration of social support systems into the care and management of patients with diabetes.

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APPENDICES

APPENDIX A: INTRODUCTORY LETTER TO NMIMR – IRB



UNIVERSITY OF GHANA  
DEPARTMENT OF ADULT HEALTH  
SCHOOL OF NURSING

Ref. No.: SON/A.12 .....

October 22, 2018

The Chairman  
NMIMR - IRB  
P.O. Box LG 581  
Univ. of Ghana  
Legon.

Dear Sir/Madam,

**LETTER OF INTRODUCTION**

This is to introduce to you Opoku-Addai Kwabena , an MPhil second year student of the School of Nursing and Midwifery.

The Scientific Review Committee of the School has approved the thesis topic: “Knowledge of Patients with Diabetes on Nutritional Management: A Study at the Korle-Bu Teaching Hospital Accra”.

I hope that the Institutional Review Board will consider the proposal to enable him collect data.

Counting on your usual co-operation

Thank you.

Yours faithfully,

Dr. Kwadwo Ameyaw Korsah  
SUPERVISOR

COLLEGE OF HEALTH SCIENCES

• P. O. Box LG 43, Legon, Accra, Ghana. • Telephone: +233 (0) 302 513 250 / 0289 531 213  
• Email: [adulhealth.son@chs.ug.edu.gh](mailto:adulhealth.son@chs.ug.edu.gh) • Website: [www.nursing.chs.ug.edu.gh](http://www.nursing.chs.ug.edu.gh)

APPENDIX B: INTRODUCTORY LETTER TO STUDY SETTING OR KBTH – IRB



**UNIVERSITY OF GHANA**  
DEPARTMENT OF ADULT HEALTH  
SCHOOL OF NURSING

Ref. No.: SON/A.12 .....

October 24, 2018

The Chairperson  
Institutional Review Board  
Korle Bu Teaching Hospital  
Accra

Dear Sir/Madam,

**LETTER OF INTRODUCTION**

This is to introduce to you Opoku-Addai Kwabena, an MPhil second year student of the School of Nursing and Midwifery.

The Scientific Review Committee of the School has approved the thesis topic: “**Knowledge of Patients with Diabetes on Nutritional Management: A Study at the Korle-Bu Teaching Hospital, Accra**”.

I hope that the directorate will consider the proposal to enable him acquire the necessary information.

Counting on your usual co-operation

Thank you.

Yours faithfully,

Dr. Kwadwo Ameyaw Korsah  
**SUPERVISOR**

COLLEGE OF HEALTH SCIENCES

• P. O. Box LG 43, Legon, Accra, Ghana. • Telephone: +233 (0) 302 513 250 / 0289 531 213  
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APPENDIX C: ETHICAL CLEARANCE FROM NMIMR – IRB

**NOGUCHI MEMORIAL INSTITUTE FOR MEDICAL RESEARCH**

*Established 1979A Constituent of the College of Health Sciences*

University of Ghana

**INSTITUTIONAL REVIEW BOARD**

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



Post Office Box LG 581  
Legon, Accra  
Ghana

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

20<sup>th</sup> November, 2018

**ETHICAL CLEARANCE**

**FEDERALWIDE ASSURANCE FWA 00001824**

**IRB 00001276**

**NMIMR-IRB CPN 035/18-19**

**IORG 0000908**

On 20<sup>th</sup> November 2018, the Noguchi Memorial Institute for Medical Research (NMIMR) Institutional Review Board (IRB) at a full board meeting reviewed and approved your protocol titled:

**TITLE OF PROTOCOL** : **Knowledge of Patients with Diabetes on Nutritional Management: A study at Korle-Bu Teaching Hospital, Accra**

**PRINCIPAL INVESTIGATOR** : **Kwabena Opoku-Addai, 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 19<sup>th</sup> November, 2019. You are to submit annual reports for continuing review.

Signature of Chair: .....  
Mrs. Chris Dadzie

(NMIMR – IRB, Chair)

**APPENDIX D: CONSENT FORM**

**CONSENT FORM**

Title: Knowledge of Patients with Diabetes on Nutritional Management: A Study at the Korle-Bu Teaching Hospital, Accra.

Principal Investigator: Kwabena Opoku-Addai

Address: School of Nursing and Midwifery

College of Health Sciences

University of Ghana

P. O. Box LG 43

Legon – Accra.

**General Information about Research**

I will like to invite you to take part in an academic research study aimed at exploring the knowledge on nutritional management of diabetes mellitus among patients living with the condition. I will want to find out your knowledge level on the nutritional management of diabetes mellitus, how motivated you are to engage in the nutritional management of your condition, the factors that motivate you to engage in the nutritional management of your condition, the nutritional management skills and abilities you possess and employ in managing your condition, and the barriers that hinder you from successfully engaging in optimal nutritional management of your condition.

If you agree to be part of this study, I will engage you in an interview which will last for about forty-five (45) to sixty (60) minutes. The interview will focus on your views and experiences on the nutritional management of diabetes mellitus. Open-ended questions on your knowledge,

1



experiences, and skills will be asked, and your responses will be sought for. The questions that will be posed to you have no correct or wrong answers so, you should freely express your views and opinion on all that would be sought for from you. The interview will be conducted at a place, date, and time convenient for you, and with your permission, the interview will be audio recorded. Also, you will be given a consent form to read and sign or thumbprint before the interview is conducted.

#### **Possible Risks and Discomforts**

Your participation in this study will not bring you any physical or social harm. However, some of the responses that will be sought for from you during the interview may bring unpleasant memories, feelings or emotions. If such a thing happens, the researcher will direct you to a clinical psychologist for help and support at no charge. Also, you have the right to refuse to answer questions that you are not comfortable with.

#### **Possible Benefits**

You will not derive any direct benefit from this research study. However, your participation in this study will bring to light the knowledge that patients with diabetes have on the nutritional management of their condition. This will lead to the organisation of health educational programs to fill the gaps in knowledge or practice regarding nutritional management of diabetes so as to improve the health of patients living with diabetes mellitus. Additionally, this can inform the provision of new guidelines or protocols on the nutritional management of diabetes mellitus in order to improve the quality of life of patients living with diabetes mellitus.



### **Confidentiality**

To ensure confidentiality, the audio recordings and interview transcripts **will be kept in a secured locker which will be locked in the personal office of the researcher for five years, during which period only the researcher and his research supervisors will have access to the raw data.** In addition, to ensure anonymity, a code or pseudonym and not your real name will be attributed to the information you give during the interview. Any other information that shows the identity of other people will be deleted. **After keeping the audio recordings and interview transcripts for five years, the audio recordings and interview transcripts will be properly discarded.**

### **Compensation**

You will not be given any compensation for participating in the study.

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

Your participation in this study is voluntary. Therefore, you have the right to opt out of the study at any time without any consequences. Your decision to withdraw from the study will not affect your treatment in the hospital.

### **Termination of Participation by the Researcher**

The researcher will terminate one's participation in the study if there is any indication that a participant is in a confused state or a participant is in distress because of the study or interview.



**Contact and Details of Clinical Psychologist**

**Dr. Samuel Adjorlolo**

**School of Nursing and Midwifery**

**College of Health Sciences**

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**P. O. Box LG 43**

**Legon – Accra.**

**Phone Number: (+233) 0204197158**

**Email: [sadjorlolo@ug.edu.gh](mailto:sadjorlolo@ug.edu.gh)**

**Contacts for Additional Information**

In case of any challenge, issue or question, contact any of the following:

Kwabena Opoku-Addai

School of Nursing and Midwifery

College of Health Sciences

University of Ghana

P. O. Box LG 43

Legon – Accra.

Phone Number: (+233) 0207071920 / (+233) 0273719283

Email: [kopoku-addai@st.ug.edu.gh](mailto:kopoku-addai@st.ug.edu.gh) / [mobbatigoal@yahoo.com](mailto:mobbatigoal@yahoo.com)



Dr. Kwadwo Ameyaw Korsah  
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Phone Number: (+233) 0243547317  
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Dr. Gwendolyn Mensah  
School of Nursing and Midwifery  
College of Health Sciences  
University of Ghana  
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Legon – Accra.  
Phone Number: (+233) 0208127756  
Email: [gpmensah@ug.edu.gh](mailto:gpmensah@ug.edu.gh)

**Your rights as a Participant**

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



**VOLUNTEER AGREEMENT**

The above document describing the benefits, risks and procedures for the research title **(Knowledge of Patients with Diabetes on Nutritional Management: A Study at the Korle-Bu Teaching Hospital, Accra)** has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name and signature or mark of volunteer

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

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

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name and signature of witness

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

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name and Signature of Person Who Obtained Consent



APPENDIX E: SCIENTIFIC AND TECHNICAL APPROVAL FROM KBTH

In case of reply the number  
And the date of this  
Letter should be quoted

My Ref. No. *KBTH/MS/PG/15*  
Your Ref. No.....



KORLE BU TEACHING HOSPITAL  
P. O. BOX KB 77,  
KORLE BU, ACCRA.

Tel: +233 302 667759/673034-6  
Fax: +233 302 667759  
Email: [info@kbth.gov.gh](mailto:info@kbth.gov.gh)  
[pr@kbth.gov.gh](mailto:pr@kbth.gov.gh)  
Website: [www.kbth.gov.gh](http://www.kbth.gov.gh)

11<sup>th</sup> December, 2018

MR KWABENA OPOKU-ADDAI  
SCHOOL OF NURSING AND MIDWIFERY  
UNIVERSITY OF GHANA  
LEGON

**SCIENTIFIC AND TECHNICAL COMMITTEE APPROVAL**  
**PROTOCOL IDENTIFICATION NUMBER: KBTH-STC 000130/2018**

The Korle Bu Teaching Hospital Scientific and Technical Committee (KBTH-STC), on 11<sup>th</sup> December, 2018 approved your submitted study protocol.

TITLE OF PROTOCOL: "Knowledge of patients with diabetes in Nutrition Management: A study at the KBTH, Accra"

PRINCIPAL INVESTIGATOR: Mr Kwabena Opoku-Addai

This approval requires that you **forward your approved document to Korle Bu Teaching Hospital – Institutional Review Board (KBTH-IRB) for the ethical aspect of the proposal to be assessed before the project can be initiated.**

This STC approval is valid till 30<sup>th</sup> October, 2019.

You may, however, request extension of the approval period, or renewal as the case may be, should the study extend beyond the stated period.

Upon completion, you are required to submit a final report on the study to the STC. This is to enable the STC ensure among others that, the project has been implemented as per the approved protocol. You are also required to inform the KBTH-STC and Research Directorate of any publications that may emanate from the research findings.

Kindly note that, should the need arise, the KBTH-STC or IRB may institute appropriate measures to satisfy itself that study is being conducted according to the highest scientific and ethical standards.

Please note that any modification to the study protocol without Scientific Technical Committee (STC) approval renders this approval invalid.

Sincere regards,

Prof. G. Obeng Adjei  
Chairman, KBTH-STC

Cc: The Chairman, KBTH-IRB

APPENDIX F: ETHICAL CLEARANCE FROM KBTH – IRB

In case of reply the number  
And the date of this  
Letter should be quoted

My Ref. No. KBTH/MI/123/19  
Your Ref. No. ....



KORLE BU TEACHING HOSPITAL  
P. O. BOX KB 77,  
KORLE BU, ACCRA.

Tel: +233 302 667759/673034-6  
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Email: [Info@kbth.gov.gh](mailto:Info@kbth.gov.gh)  
[pr@kbth.gov.gh](mailto:pr@kbth.gov.gh)  
Website: [www.kbth.gov.gh](http://www.kbth.gov.gh)

21<sup>st</sup> January, 2019

MR KWABENA OPOKU-ADDAI  
DEPT. OF ADULT HEALTH  
SCHOOL OF NURSING AND MIDWIFERY  
UNIVERSITY OF GHANA  
LEGON

**KNOWLEDGE OF PATIENTS LIVING WITH DIABETES ON NUTRITIONAL  
MANAGEMENT: A STUDY AT THE KORLE-BU TEACHING HOSPITAL**

**KBTH-IRB /000130/2018**

**Investigator: Mr. Kwabena Opoku-Addai**

The Korle Bu Teaching Hospital Institutional Review Board (KBTH IRB) reviewed and granted approval to the study entitled “Knowledge of patients living with diabetes on nutrition management: A study at the Korle Bu Teaching Hospital”

Please note that the Board requires you to submit a final review report on completion of this study to the KBTH-IRB.

Kindly, note that, any modification/amendment to the approved study protocol without approval from KBTH-IRB renders this certificate invalid.

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

This IRB approval is valid till 30<sup>th</sup> December, 2019. You are to submit annual report for continuing review.

Sincere regards,

  
MR OKYERE BOATENG  
CHAIR (KBTH-IRB)

Cc: The Chief Executive Officer  
Korle Bu Teaching Hospital

**APPENDIX G: APPROVAL LETTER TO HEAD OF NDMRC OF KBTH**

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**MEDICAL DIRECTORATE  
KORLE BU TEACHING HOSPITAL**

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22<sup>nd</sup> January, 2019

THE HEAD  
NATIONAL DIABETES MANAGEMENT AND RESEARCH CENTER  
KORLE BU

**LETTER OF INTRODUCTION – MR KWABENA OPOKU-ADDAI**  
**“KNOWLEDGE OF PATIENTS LIVING WITH DIABETES ON NUTRITION**  
**MANAGEMENT: A STUDY AT THE KORLE BU TEACHING HOSPITAL”**

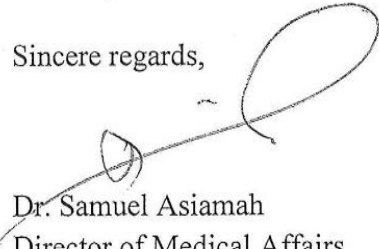
I have the pleasure to introduce to you the above named Investigator from Department of Adult Health, School of Nursing and Midwifery, University of Ghana, Legon. Mr Kwabena Opoku-Addai sought and has been granted approval to conduct a study entitled “Knowledge of patients living with diabetes on nutrition management: A study at the Korle Bu Teaching Hospital” in your Department.

He is to contact you to discuss the commencement date of the study.

Please verify his identity with a Government issued National ID card and accord him the needed assistance.

Attached is the Scientific and Technical Committee and Institutional Review Board approval which specifies the terms.

Sincere regards,



Dr. Samuel Asiamah  
Director of Medical Affairs  
For: Chief Executive

Cc: The Chief Executive  
Korle Bu

## APPENDIX H: INTERVIEW GUIDE

### SECTION A: DEMOGRAPHIC INFORMATION

Code number / Pseudonym:

1. Age: 18 – 29 ( ), 30 – 39 ( ), 40 – 49 ( ), 50 – 59 ( ), 60 and above ( )
2. Level of education: Primary ( ), JHS ( ), SHS ( ), Tertiary ( ), Nil ( )
3. Gender.....
4. Duration of diagnosis of condition.....
5. Occupation.....
6. Marital status.....
7. Ethnicity/Tribe.....
8. Religion.....

### SECTION B: GUIDING QUESTIONS

1. How do you manage your condition nutritionally?

Probe

- i. What sources of carbohydrates do you take?
- ii. What types of food do you eat?
- iii. What is the quantity of food you usually eat?
- iv. What is the effect of the types of food you eat on your blood glucose level?

2. How do you motivate yourself intrinsically to engage in the nutritional management of your condition?

Probe

- i. What personal beliefs, values, and attitudes motivate you to manage your condition nutritionally?

3. How do you motivate yourself extrinsically to engage in the nutritional management of your condition?

Probe

- i. How involved is your family members and significant others in the care and management of your condition?
- ii. How do your family members and significant others support and motivate you to manage your condition nutritionally?
- iii. How do diabetes peer support groups support and motivate you to manage your condition nutritionally?
- iv. How do the health care professionals help and support you in the care and management of your condition?

4. How do you regulate your carbohydrates intake and eating pattern?

Probe

- i. How often do you read and make use of food labels when buying food products?
- ii. What are the things you take into consideration on food labels before you buy food products with labels?

5. How do you plan your meals as a means of managing your condition nutritionally?

Probe

i. What are the things or factors you consider when planning your meals?

6. Is there anything else you will like to tell me?

**APPENDIX I: SUMMARY OF SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS**

	<b>PSEUDONYM</b>	<b>AGE</b>	<b>LEVEL OF EDUCATION</b>	<b>GENDER</b>	<b>DURATION OF DIAGNOSIS</b>	<b>OCCUPATION</b>	<b>MARITAL STATUS</b>	<b>RELIGION</b>	<b>ETHNICITY</b>
1	Kwadwo	58	SHS	Male	6 years	Electrician	Married	Christian	Ewe
2	Kwabena	86	JHS	Male	23 years	Pensioner	Widower	Christian	Akan (Fante)
3	Adwoa	60	JHS	Female	14 years	Trader	Married	Christian	Akan (Ashanti)
4	Akwasi	42	JHS	Male	6 years	Welder	Married	Christian	Ga-Adangbe (Ga)
5	Abena	47	Primary	Female	10 years	Trader	Married	Christian	Akan (Ashanti)
6	Yaa	60	SHS	Female	14 years	Food Vendor	Married	Christian	Ga-Adangbe (Ga)
7	Akua	78	Primary	Female	28 years	Trader	Widow	Christian	Akan (Ashanti)
8	Kwame	53	JHS	Male	18 years	Trader	Married	Christian	Akan (Akyem)
9	Kwaku	63	SHS	Male	25 years	Driver	Widower	Christian	Ewe
10	Yaw	66	SHS	Male	19 years	Pensioner	Married	Christian	Ga-Adangbe (Ga)
11	Kofi	76	Tertiary	Male	25 years	Pensioner	Married	Christian	Akan (Ashanti)
12	Ama	69	Tertiary	Female	10 years	Pensioner	Widow	Christian	Ga-Adangbe (Adangbe)
13	Dede	68	JHS	Female	30 years	Unemployed	Widow	Christian	Akan (Ashanti)
14	Afia	58	SHS	Female	2 years	Trader	Married	Christian	Akan (Akyem)
15	Akosua	52	JHS	Female	16 years	Trader	Married	Christian	Akan (Ashanti)