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FACTORS ASSOCIATED WITH DIABETES SELF MANAGEMENT AMONG DIABETES PATIENTS ATTENDING THE GREATER ACCRA REGIONAL HOSPITAL

BY

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DECLARATION

With the exception of the duly acknowledged references, I, Nana Akua Asante, hereby declare that this dissertation is the result of my own original work at the Department of Health Policy Planning and Management at the School of Public Health, College of Health Sciences, University of Ghana, and hence, has not been presented for any other degree in this university or elsewhere either in whole or in part. I am responsible for the views expressed and the factual accuracy of its contents.

…….	…….
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(Student)	(Supervisor)
Date:…….	Date: …….

DEDICATION

I dedicate this piece of research to my beloved father, Mr George Asante.

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I am grateful to the ALMIGHTY LORD for the guidance and protection throughout the academic journey.

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LIST OF ABBREVIATIONS

ACT……Acceptance and Commitment Therapy

BMI……Body Mass Index

CCM……...Chronic Care Medical

CVD……...CardioVascular Diseases

DSME……Diabetes Self-Management Education

GDM……..Gestational Diabetes Mellitus

HBA1C……..Glycated Haemoglobin

IDDM……Insulin Dependent Diabetes Mellitus

NCD……...Non Communicable diseases

PCOM……Provider Communication

PDMstyle……...Provider Decision Making Style

SDSCA……..Summary of Diabetes Self Care-Activities

SES…….Socio - Economic Status

T2D……Type 2 Diabetes

T1D……Type 1 Diabetes

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DEFINITION OF TERMS

Diabetes self-management: refers to the various tasks that individuals with diabetes, need to conduct on a regular basis and includes self-monitoring of glucose, taking medications properly, physical activity, healthy eating and foot exams.

Summary of diabetes self-care activities (SDSCA): A measure of the diabetes self- management practices among patients with diabetes.

ABSTRACT

Background: Globally, the leading cause of death are non-communicable diseases (NCDs) as against all other causes put together. One of the key NCDs killing a lot of people, especially in Ghana is diabetes. The evidence shows that diabetic self-management education and practices could bring about a reduction in Haemoglobin A1C (HbA1C). It is important to unravel the factors that could affect the successful implementation of diabetic self-management.

Objective: This study examined factors associated with diabetes self-management among patients with diabetes attending the Greater Accra Regional Hospital (GARH).

Methods: Exploratory cross sectional study design using quantitative methods was used for this study where 198 patients with diabetes attending (GARH) were randomly selected. Data was collected using a summary of diabetes self-care activities, diabetes knowledge questionnaire, provider participatory decision making style (PDMstlye), patient communication (PCOM), patient understanding of diabetes sel-management and social support scale. In addition, patients' socio-demographic characteristics were assessed. Quantitative data was cleaned and coded before being entered into epidata and imported into STATA version 15 for statistical analysis. Pairwise correlation, simple and multiple linear regression were used to assess the association between the dependent and independent variables. Significance of the association was accepted at $p<0.05$ at 95% confidence level.

Findings: the level of high or good diabetes self - management practices is 25.2%. Under the multivariate analysis, being a female was statistically significant with an increased SDSCA (β=4.64; 95%CI= 0.65-8.62) and high satisfaction with how well health care providers helped patients understanding of diabetes self-management was also significant with an increase in

participant's SDSCA (β=3.47; 95%CI= 1.46-8.22). Other variables were not significantly associated with SDSCA

Conclusion: The level of diabetes self-management practices among patients with diabetes attending the GARH was found to be low. There is therefore the need for making policies that will improve diabetes self-management activities to ensure better treatment outcomes among diabetes patients at the hospital in particular and the country as a whole.

CHAPTER ONE
INTRODUCTION

1.0. Background to the study

Globally, the leading cause of death are non-communicable diseases (NCDs) as against all other causes put together (WHO, 2010, 2018). It is reported that almost 80% of non-communicable diseases deaths are seen in the low and middle income countries, including Ghana (WHO, 2010, 2018). Additionally, the global statistics show that the number of individuals with diabetes has markedly increased from 108 million in 1980 to 422 million in 2014 (Mathers & Loncar, 2006; WHO, 2018). The prevalence of those who are 18 years and above has also increased from 4.7% in 1980 to 8.5% in 2014 (Mathers & Loncar, 2006; WHO, 2018).

These should be considered against the background that the Sustainable Development Goals (SDGs) have been a priority that all member countries of the World Health Organization (WHO), including Ghana are trying to achieve by 2030 (Kates, Parris, & Leiserowitz, 2018). The indicator 4 of SDG 3 is to reduce the number of people who die from non-communicable diseases by one-third by 2030 (World Health Organisation, 2018). This makes non-communicable diseases also a priority in Ghana. Crucially, one of the key NCDs killing a lot of people, especially in Ghana is diabetes (de-Graft Aikins, Awuah, Pera, Mendez, & Ogedegbe, 2015). Affusim and Francis (2018) note that diabetes is one of the main issues affecting more individuals every day in the third Millennium.

Diabetes and its associated complications are a component of a worldwide epidemic of chronic disease that poses a public health problem (Grant, Hicks, Taylor, Chittleborough, & Phillips, 2009). A report shows that, for all kidney failure cases that were diagnosed for the first time in 2008, diabetes contributed to about 44%, making it the number one cause of kidney failure and

not only that, but it was also noted to be the top cause of all newly diagnosed blindness among those who are between the ages 20 and 27 years (Centres for Disease Control, 2011).

Affusim and Francis (2018) note that for diabetes to be well controlled and appropriately managed, patients must stick to therapy schemes which include following their dietary plan, exercise goals, and self-monitoring of glucose levels. Steineck et al. (2015) also argue that complications affect the quality of life of individuals living with diabetes, however, diabetes self-management practices could reduce these complications. This suggestion is confirmed by the evidence from another study that diabetic self-management education and practices could bring about a reduction in HbA1C (Chrvala, Sherr, & Lipman, 2016). It is, therefore, important to understand that diabetes self-management refers to the various tasks that individuals with diabetes, need to conduct on a regular basis, including self-monitoring of glucose, taking medications properly, physical activity, healthy eating and foot exams (Nam, Chesla, Stotts, Kroon, & Janson, 2011). However, other evidence shows that there are several factors affecting the capacity of the patients with diabetes to follow certain interventions correctly, including treatment expectations, and lack of social support (Affusim, & Francis, 2018). It is important to unravel other factors that could facilitate or impede the successful implementation of diabetic self-management so as to bring out the prospects for adopting this strategy in the management of diabetes in hospitals in Ghana.

The patients' socio-demographic characteristics are important elements that would assist in assessing the success of the adoption and implementation of diabetes self-management (Gele, Torheim, Pettersen, & Kumar, 2015). A study found that the factors linked to reduced quality of life of patients with diabetes included: low educational level, reduced income, older age, being female, number of diabetes complications, number of comorbid diseases, and reduced exercise

levels (Glasgow, Ruggiero, Eakin, Dryfoos, & Chobanian, 1997). Health provider factors, for instance, provider-patient communication, are also necessary to emphasise in the context of assessing factors that influence diabetes self-management (Habte *et al*., 2016). Habte *et al*. (2016) argue that the evidence from the developed world shows that healthcare providers' understanding of patients' views on chronic illnesses such as diabetes is essential for health care providers to develop effective approaches to help patients handle their conditions (Habte *et al*., 2016). Habte *et al*. (2016) support this by suggesting the need for a strong diabetes care programme sensitive to the experiences of patients with their diseases, including emotional distress.

It should be observed that a study conducted in Sub-Saharan Africa (SSA), particularly a country like Ghana requires that socio-cultural / social support factors are factored into the equation when assessing the predictors for the implementation of diabetes self-management (Affusim, & Francis, 2018). Affusim and Francis (2018) found that social support was associated with medication adherence, clinic attendance, and BMI, but not associated with blood sugar level among patients with diabetes. Specifically, in Ghana, a study discovered an association between diabetes and its complications and dietary habits, family history, smoking, excessive alcohol consumption and lack of exercise), emotional stress, sorcery and witchcraft (de-Graft Aikins *et al*., 2015).

Against the background of the above analysis, this study was aimed to examine factors associated with diabetes self-management among patients attending the Greater Accra Regional Hospital.

1.1. Problem Statement

There is an estimated 16 million people living with diabetes in the WHO African Region (International Diabetes Federation, 2018). It was estimated that diabetes directly killed 1.6 million people in 2015, compared with about 2.2 million deaths in 2012 (WHO, 2018). Other reports showed that there were about 518,400 diabetes cases in Ghana with a prevalence of 3.6% as at 2017 (International Diabetes Federation, 2018). Even as patients with diabetes who participate in diabetes self-management practices have been able to achieve good glycemic control and a decrease in their complications, adherence to and compliance with these activities have been found to be very low (Shrivastava, Shrivastava, & Ramasamy, 2013).That is, despite the importance of diabetes self-management in controlling blood sugar and its associated complications, a study found that only about 5% of newly diagnosed diabetics utilised the diabetes self-management education training services let alone to practice them; and the practices of these activities have been shown to be very low in LMICs (Strawbridge, Lloyd, Meadow, Riley, & Howell, 2015). Shrivastava *et al*. (2013) revealed that people living with diabetes who participated in diabetes self-care practices had been able to achieve good glycemic control, however, baseline information about the prevalence of diabetes self-management in Ghana is inadequate(de-Graft Aikins *et al*., 2015).

Problems associated with the use of diabetes self-management practices could be examined from the lenses of patients' socio-demographic characteristics (Glasgow *et al*., 1997). Glasgow and colleagues (1997) reveal that the quality of life is a significant and understudied issue in diabetes that seems to be linked to demographic factors, medical-history, and aspects of self-management.

Other researchers suggested that individuals, especially healthcare providers providing the diabetes care should take into account local and individual context and should aim for a patient-centered strategy and active involvement of patients (Habte *et al*., 2016). However, it appears that even the healthcare providers have some challenges with regards to how they communicate with their patients (Habte *et al*., 2016). For this reason, a study argues that there is the need for better training of health providers in various fields, including health communications and diabetes self-management (Habte *et al*., 2016).

Affusim and Francis (2018) note that since social support can predict health-promoting behaviour, it could also predict self-care behaviour of patients living with diabetes. Although involvement of family members, particularly the spouse, in self-care behaviours could be important in offering health care to diabetes patients, this is sometimes difficult to achieve among patients who are either single, separated, divorced or widowed.

These challenges have to be addressed in order to ensure the success of diabetes self-management intervention.

1.2. Justification of the study

Despite the large number of people living with diabetes, resources such as diabetes knowledge, needed for management of diabetes in Ghana tend to be inadequate (de-Graft Aikins, 2005). Darkwa (2011) found that life style was among the major risk factors predisposing people to diabetes and its complications.

De-Graft Aikins (2005) is of the view that to minimise improper healer shopping and maximise committed biomedical and controlled ethnomedical management for Ghanaians with diabetes, the biggest difficulties are provision of inexpensive pharmaceutical medicines, standardised

ethnomedical medicines, recommended foods, and psychosocial support. This suggestion relates to how healthcare system factors could influence the diabetes patients' practices of self-management and ensure effective provider-patient communication, however, it appears that no study has taken it up to do any in-depth analysis in Ghana (de-Graft Aikins *et al*., 2015). As a result, this study examined how healthcare provider factors (provider-patient communication, among others) could influence patients' practices of diabetes self-management with a special emphasis on patients attending the Greater Accra Regional Hospital.

It is important to assess how diabetes patients' own personal characteristic, including their age, sex, educational level, among others, could influence their decision to adopt diabetes self-management practices. For example, a study reported that sex was significantly associated with the diabetic patient's occupation while males were more educated with only five having no formal education – there was a strong association between sex and education (Ovenseri-Ogbomo, Abokyi, Koffuor, & Abokyi, 2013). Despite these revelations and recommendations, it seemed that there was limited evidence on the analysis relating to how patients' socio-demographic characteristics could associate with their diabetes self-management practices at the Greater Accra Regional Hospital. This study sought to fill the gaps in literature and provide the basis for healthcare managers to consider the need to adopt diabetes self-management practices.

It is anticipated that managing diabetes is a very complex task, which involves a multidisciplinary approach (Darkwa, 2011). There was the need to investigate how socio-cultural/social support factors, including the communities within which diabetes patients live associate with their desire to adopt self-management practices.

Family and social support, as well as self-efficacy for self-care to reach best health outcomes among people diabetes patients may be limited (de-Graft Aikins, 2005). Even as it is important to study the underlying factor of why diabetes patients seek spiritual causes for diabetes, it was apparent that most studies had not adequately addressed all the inherent socio-cultural/social support factors (de-Graft Aikins, 2005; Ovenseri-Ogbomo *et al*., 2013). This necessitated the need to conduct a study of this nature with the view to filling the gaps in the literature.

Based on the analysis of the gaps in literature, the question that this study sought to find answers to was *'*what are the factors associated with the Diabetes Self-Management?*'*. It should be noted that although diabetes self-management practices happen to be an important component of the diabetes management, few studies had sought to determine factors associated with diabetes self-management practices, especially in Ghana (see de-Graft Aikins, 2005). Generally, it appears that most of the studies focused on the patient factors associated with the self- management without paying much attention to the health care provider factors (provider-patient communication, among others) as well as the socio-cultural / social support factors (Darkwa, 2011; Ovenseri-Ogbomo *et al*., 2013).

Hence, the gaps in the literature would somewhat be filled by this study. It is by determining the factors associated with self-management among Ghanaians living with diabetes, that policy makers could develop interventions that would ensure that patients are given the opportunity to consider, adopt, and maintain the central tasks of diabetes self-management, including practicing healthy lifestyle behaviours related to nutrition and physical activity, taking recommended medications, glucose self-monitoring, and seeking medical care - these are the tenets of diabetes self-management practices (Nam *et al*., 2011). Eventually, the findings would contribute to existing literature in the field of diabetes care.

1.3.1. General Objective

The general objective of the study was to examine factors associated with diabetes self-management among diabetic patients attending the Greater Accra Regional Hospital.

1.3.2. Specific Objectives

The following specific objectives helped to address the general objective:

To determine the level of diabetes self-management (self-care practices) among diabetic patients attending the Greater Accra Regional Hospital.

To determine the patient (socio-demographic characteristics) factors associated with diabetes self-management (self-care practices) among diabetic patients attending the Greater Accra Regional Hospital.

To determine the health provider factors (provider-patient communication, among others) associated with diabetes self-management (self-care practices) among diabetic patients attending the Greater Accra Regional Hospital.

To determine the association between diabetes knowledge and diabetes self-management (self-care) practices.

To examine the association between community related factor [social (family & friends) support] and diabetes self-management (self-care practices) among diabetic patients attending the Greater Accra Regional Hospital.

1.3.3. Research Questions

The questions that helped to find answers to address the specific objectives of the study included:

What is the level of diabetes self-care practices among diabetic patients attending the Greater Accra Regional Hospital?

What are the patient (socio-demographic characteristics) factors associated with diabetes self-management (self-care practices) among diabetic patients attending the Greater Accra Regional Hospital?

What are the health provider factors associated with diabetes self-management (self-care practices) among diabetic patients attending the Greater Accra Regional Hospital?

What is the association between community related factor (social support) and diabetes self-management (self-care practices) among diabetes patients attending the Greater Accra Regional Hospital?

What is the association between diabetes knowledge and diabetes self-management (self-care practices) among diabetes patients attending the Greater Accra Regional Hospital?

1.4. Outline of the Dissertation

The report of this study has been presented according to specific chapters, which focus on particular issues. Chapter one is the introduction to the study where the background, problem statement, justification, objectives and research questions have been presented. In chapter two, the current literature and concepts in relation to the topic have been outlined. Chapter three is expounds the methods that were adopted in collecting empirical data for subsequent analysis in this study have been presented. In chapter four, the results obtained from analysis of this quantitative study have been explained. In chapter five, the key findings of the study have been related to current literature and discussed. Chapter six is where the summary of the study,

conclusions drawn and recommendations made based on the key findings of the study have been demonstrated.

CHAPTER TWO
LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.0. Introduction

This chapter presents analysis of related studies on the topic under consideration. It is divided into five sections. Section one presents the concept or definition of diabetes mellitus. Section two presents the factors associated with or influencing diabetes self-management practices, which include the patient (socio-demographic characteristic) factors, healthcare / facility related factors (provider-patient communication, among others), knowledge on diabetes and social support. Section three presents the theoretical underpinning of the study. Section four presents the conceptual framework of the study. Section five presents the gaps in existing literature on the topic under study. Section six presents the chapter summary.

2.1. Diabetes Mellitus

The American Diabetes Association (2014), defines diabetes as a group of metabolic diseases characterised by hyperglycemia resulting from abnormalities in insulin secretion, insulin action, or both. Insulin is very important in the management of diabetes because it is needed to send glucose into cells for use by the body tissues and organs (Habte, Kebede, Fenta, & Boon, 2016). It has been documented that three main types of diabetes exist, namely type 1 diabetes mellitus, type 2 diabetes mellitus and gestational diabetes mellitus (Tao *et al*., 2015). These have been explained further as follows:

Type 1 diabetes (T1DM): Islet β cells of the pancreas which produce insulin are damaged leading to little or no insulin secretion (Tao *et al*., 2015).

Type 2 diabetes (T2DM): This type of diabetes starts with insulin resistance, in which the body is unable to use the insulin, eventually as the disease progresses, a lack of insulin may also develop (Tripathy, Chandalia, & Das, 2012; Tao *et al*., 2015). T2DM makes up a greater proportion of the diabetes in the world, and is also associated with obesity, smoking, unhealthy eating and lack of exercise (World Health Organisation, 2010).

Gestational diabetes (GDM): This type of diabetes occurs when pregnant women without a previous history of diabetes develop a high-blood glucose level.

The effects of poorly managed diabetes is large and is linked with long-term defects, dysfunction, and failure of several organs (American Diabetes Association, 2014). However, the view is that a good diabetes management outcome depends on the individual with the disease as much as it depends on the physician (Gao *et al*., 2013). It is necessary to identify the risk factors for diabetes to aid in managing it successfully. The risk factors have been explained below.

2.1.1. Risk factors for diabetes

Some analyst suggest that the risk factors for diabetes mellitus include physical inactivity, smoking, consuming excessive alcohol, and increasing Body Mass Index (BMI) (see Bell, Kivimaki, & Hamer, 2014). Other studies have enumerated obesity, as a well- established risk factor for type 2 diabetes (IDF, 2011; Bell *et al*., 2014).

In addition, there are other contributing factors, which have been enumerated to include physical inactivity and an energy- dense/poor nutient diet, which includes taking sugar excessively, along with genetic, ethnic and socioeconomic susceptibilities (Boyko, Fujimoto, Leonetti, & Newell-Morris, 2000; Schulze *et al*., 2004; Hu *et al*., 2001; Abate, & Chandalia, 2003; Hu, Li, Colditz,

Willett, & Manson, 2003; Malik, Popkin, Bray, Després, & Hu, 2010a; Malik et al., 2010b; Lee, Brancati, & Yeh, 2011; Bell *et al*., 2014).

It has been suggested that individual's lifestyle could be a contributory risk factor for diabetes as diabetes complications is decreased by 50–75% due to tight glucose control from life style self-management and medical therapy (Diabetes Control and Complications Trial Research Group, 1993, UK Prospective Diabetes Study Group, 1998; Brown *et al*., 2002). For instance, physical inactivity is a risk factor and the evidence suggests that physical activity is believed to play an important part in the prevention of obesity, and possibly diabetes, in genetically vulnerable communities, such as Native Americans, Mexican-Americans, and African-Americans (Esparza *et al.*, 2000). With thorough medical supervision and a patient who is well trained in Lifestyle behaviors, life style self-management is most effective (Norris, Engelgau, & Narayan, 2001; Brown *et al*., 2002).

In view of the above, it is important to note that efforts made to reduce these risk factors could minimise the risk for getting the disease and even control the blood glucose in patients with the disease. Diabetes self-management practices are some of the means by which the individual could use to reduce some of these risk factors (Nam, Chesla, Stotts, Kroon, & Janson, 2011). The concept of diabetes self-management practices is elucidated on below.

2.1.2. Diabetes self-management

Diabetes self-management as the various tasks that people with diabetes, need to perform and engage in on a daily basis (Nam *et al*., 2011). Nam *et al*. (2011) explain that these include self-monitoring of glucose, taking medications as required, exercise, healthy eating and foot examinations at regular intervals.

For a successful outcome of diabetes self-management, it is important that education of both the patient and health providers becomes a key component (Funnell *et al*., 2009). Notably, diabetes self-management education (DSME) is the continuing method of promoting diabetes self-care understanding and skills (Funnell *et al*., 2009). Funnell *et al*. (2009) expatiate that this method includes the needs, experiences in life and goals of the person with diabetes and it is driven by evidence-based standards. More importantly are the goals of DSME which are supporting informed decision-making, self-care behaviours, problem-solving and active cooperation with the health care team and improving health status, clinical outcome and quality of life (Funnell *et al*., 2009).

However, there are challenges to the successful implementation of diabetes self-management since compliance with interventions differ from one patient to the other (see Yekta *et al*., 2011). Against this backdrop, it was considered relevant to examine the level of diabetes self-management practices in order to understand and appreciate the factors involved as presented below.

2.1.3. Level of self-management of diabetes

The level of adherence to diabetes self-management has been reported with mixed results in the literature (Khattab, Khader, Al-Khawaldeh, & Ajlouni, 2010; Yekta *et al*., 2011; Gopichandran *et al*., 2012; Gurmu, Gela, & Aga, 2018). Khattab *et al*. (2010) reported that about 81.4% of patients did not follow diabetic meal plan as recommended by the dieticians, 67.9% did not participate in physical exercise, only 38.1% tested their blood sugar at home, 91.9% were highly adherent to their medications; and 91.1% reported having family support about diabetes and its management.

Yekta et al. (2011) found that the self-care practice was good in only 15.1%, moderate in 58.7% and poor in 26.2%. These researchers concluded that, although self-care practice was important in the management of diabetes, most of the patients had inappropriate self-care practices, especially self-monitoring of blood glucose which plays a crucial role in controlling diabetes. A similar study found that an increased duration of diabetes, not following dietician-recommended eating plan, bad attitude towards diabetes, and increased obstacles to adherence scale scores significantly increased odds of poor glycemic control (Khattab *et al*., 2010).

Another cross sectional survey done in an urban community in southern India showed that only 20% of the study population had good dietary habits, 19.5% had exercising habits, 70% monitored their blood sugar at regular intervals and 79% adhered to their medication (Gopichandran *et al*., 2012). Another study found that 45.5% score was below the mean on the SDCSA measure (which is a measure of the diabetes self-care practices), indicating poor self-care practice (Gurmu, Gela, & Aga, 2018). Additionally, a cross sectional study among diabetes patients attending three tertiary hospitals in Nigeria found that only 10.2% out of the 352 patients had good practice of diabetes foot care (Desalu *et al*., 2011).

It seems that the traditional interventions have been ineffective calling for the need to adopt culturally competent approaches to be used in clinical or community settings (Brown *et al*., 2002). Kaveeshwar and Cornwall (2014) alluded to the reality that many factors influence the prevalence of disease in a country, and these factors need to be identified to promote change when facing health challenges. Hence, in an attempt to promote concordance with the treatment regimen and improve glycaemic control, it is significant to acknowledge and address any such barriers collaboratively (Ahopa & Groop, 2012). Therefore, it is necessary to understand the

factors that may associate with or influence diabetes self-management amongst patients – some of these have been presented below.

2.2. Factors associated with or influencing Diabetes Self-Management Practices

This section presents the analysis of factors associated with diabetes self-management based on current literature. Ahopa and Groop (2012) confirm that diabetes self-management is associated with various individual and environment-related factors that either promote or impede good self-management. Generally, these factors could be classified as social determinants, which include 'the economic and social gradient influenced by a broad set of conditions such as availability of resources to meet daily needs, access to educational, and job opportunities, access to health care services, availability of community-based resources, social support, and socioeconomic conditions, among others' (US Department of Health and Human Services, 2008; Walker, Smalls, Campbell, Williams, & Egede, 2014:29). Some of these factors have been categorised into patient-related, health facility (provider-patient communication, among others) and social support factors as discussed in this section.

2.2.1. Patient (Socio-demographic characteristics) factors

This sub-section presents the analysis of patient (socio-demographic characteristics) that have an influence on diabetes self-management based on existing literature. For the purposes of this study, the patient (socio-demographic characteristics) factors considered to have been associated with diabetes self-management included age, sex, level of education, marital status, place of residence, occupation, income (see Walker *et al*., 2014). The success of the diabetes self-management depends on the desire of the patient to adhere to the regimen or practices given their socio-demographic characteristics (Desalu *et al*., 2011).

Age

The age of the diabetic patient could be a determining factor to their choice and practices of diabetes self-management (see Akter et al., 2014). A study of adults with type 2 DM in Northern Greece, showed that those who were aged 65 years and above and had higher educational level did not have good dietary habits (Chourdakis, Kontogiannis, Malachas, Pliakas, & Kritis, 2014). A similar evidence exists that the probability of diabetes in people between 55 and 59 years of age was almost double that in people between 35 to 39 years of age (Akter et al., 2014). However, a study noted that younger patients with type 2 DM were more at risk for complications from DM (Chourdakis et al., 2014).

Sex

The sex of the patient with diabetes has an association with their conviction to practice diabetes self-management (Gopichandran et al., 2012). Gopichandran et al. (2012) found that being male and married significantly favoured good exercise behaviour while being married and belonging to the higher socioeconomic status were significantly associated with monitoring of blood sugars among patients. Additionally, a cross sectional study showed that women compared with men were more unlikely to engage in regular exercise but better adhered to healthy diets, regular checking of their blood sugar and examining their foot (Yu, Lyles, Bent-Shaw, & Young, 2013). However, a study reported that sex and practice of foot care were not significantly related (Hasnain & Sheikh, 2009).

Level of Education

The educational background is said to have an association with the need for diabetic patients to practice self-management (Akter et al., 2014). Akter et al. (2014) reported that the probability of

diabetes was significantly associated with level of education, body weight and hypertension. Yekta et al. (2011) in a study stated that there was a significant association between education and self-care practices of patients. Another study established that educational status of the patient significantly associated with good practice of foot care (Hasnain & Sheikh, 2009). Chourdakis et al. (2014), indicated that patients with higher educational level exercised regularly.

Marital status

The marital status of a diabetic patient has an influence on their acceptance and use of diabetes self-management (Gopichandran et al., 2012). Gopichandran et al. (2012) found that respondents who were married and were male had good exercise behaviours while those who were married and had higher socio-economic status were significantly associated with monitoring of blood sugar.

Occupation

Pyatak (2011) identified seven themes that described the relationship between participating in valued occupations and attending to the complex factors that dictate successful diabetes self-management including; emotional reactions to diabetes; negotiation of unanticipated events; embodied knowledge of diabetes; health care access and satisfaction; shifting physical contexts; social support, sensitivity, and stigma; and schedules, routines, and special events (Pyatak, 2011). Thompson (2014) highlighted the significance of taking into account the individual experience of diabetes self-management occupations and the need to cultivate habits and routines to support management of diabetes. This researcher suggested the need to broaden knowledge of how daily routines and habits could impact health in people with diabetes (Thompson, 2014).

Economic status/income

The economic circumstances within which diabetic patients find themselves have much to do with their decision to be involved in diabetes self-management practices accordingly (Grintsova et al., 2014). Akter et al. (2014) reported that respondents from the wealthiest families had a high probability to have diabetes than those from the poorest. Grintsova et al. (2014) explained that socio-economic inequalities in diabetes care do exist; and low individual socio-economic status (SES) are often associated with worse process indicators and worse intermediate outcomes.

This could be explained by the current economic dispensation where patients have to pay out of pocket for healthcare services accessed unless they hold a national health insurance card in most Sub-Saharan African countries, including Ghana (see Odeyemi, & Nixon, 2013). Other studies demonstrate that other environmental factors have been implicated, some of which are modifiable and open to intervention, including low socioeconomic status (Esparza et al., 2000).

2.2.2. Knowledge of diabetes

This sub-section presents the analysis of studies related to patients' knowledge of diabetes. Knowledge of patients of the diabetes has the chance of enhancing their acceptance and practice as evidenced in several studies (see Akter et al., 2014). A study found an association between diabetes knowledge and medication adherence, exercise, blood glucose monitoring and foot care (Smalls et al., 2012). van der Heide et al. (2014) confirmed that patients with more diabetes knowledge were more unlikely to smoke and less likely to have poor glucose control. Additionally, a cross sectional study from Ghana, found that patients who had more diabetes knowledge were more likely to participate in self-care practices - there was a positive correlation

between diabetes knowledge and blood sugar testing as well as foot care (Kugbey, Oppong Asante, & Adulai, 2017).

However, there may be instances where the patients may not have knowledge of diabetes or the attainment of knowledge may not translate into practice of diabetes self-management (Desalu et al., 2011). For instance, a study found that health literacy and diabetes knowledge were not directly associated with self-care or medication adherence (Bains & Egede, 2011). A different study concluded that even though the respondents had good knowledge, they showed poor attitude and practice towards diabetes (Rathod, Rathod, Parmar & Parikh, 2014).

Desalu et al. (2011) reported that 78.4% of diabetes patients who were attending three tertiary hospitals in Nigeria with poor foot care practices had poor knowledge. In a related study, knowledge of diabetes among people living with diabetes in Nigeria was poor and linked to age, educational level, employment status, satisfaction with education received, and household wealth (Jasper et al., 2014). Similarly, in Ghana, a study discovered that diabetes knowledge and medication adherence were not related (Kugbey et al., 2017). Other analysts also established that other environmental factors could be implicated such as lack of education about health and using healthcare systems (Esparza et al., 2000).

To resolve the differences in opinion regarding how knowledge enhances the use of diabetes self-care management, several suggestions have been made (see Cafazzo, Casselman, Hamming, Katzman, & Palmert, 2012; Rathod et al., 2014). For example, study suggests that repeated reinforcement and motivation along with health education would definitely bring about a positive change in practices (Rathod et al., 2014).

2.2.3. Health provider factors

This sub-section presents the health facility or provider factors that may have an influence on diabetes self-management based on recent literature. The reality is that the inequalities exist across different health care systems (Grintsova et al., 2014). Despite there being a lot of health provider factors associated with diabetes self-management, this section will focus on three key areas: provider communication, patients' understanding of diabetes self-management and involvement of patients in decision making as presented below.

Provider communication &patients' understanding of diabetes self-management

Some studies emphasized that although researchers may regard various demographic, socio-economic and social support factors as beneficial contributors in enabling self-care activities in diabetic patients, the role of clinicians in self-care promotion is essential (Shrivastava et al., 2013). Lipton et al. (1998) argued that if there was an existence of a proper communication between the provider and patient during counselling session, it would help remove some of the challenges that patients encounter. Thus, some analysts argue that it is essential to recognize the multi-faceted nature of the issue in order to adopt a systematic, multi-pronged and an integrated strategy to promote self-care practices among diabetic patients; this will assist in preventing any long-term complications (Shrivastava et al., 2013).

Arguably, patients may have some hidden barriers and it is through the adoption and application of humane counselling approach that they would be confident to share (see Lipton et al., 1998). A positive outcome of a good counselling using the most effective communication methods between health providers and patients was demonstrated in a study, which observed that better provider-patient communication, social support, and greater self-efficacy were related to diabetes

self-care behaviours; and these behaviours were directly related with glycemic control (Gao et al., 2013).

Despite the usefulness of good communication and understanding between providers and patients, some challenges have been recorded (Lipton et al., 1998). This is confirmed by the report that counselling of patients would be effective if there was proper communication between the health provider and the patient, however, this appears to be problematic in some settings (Lipton et al., 1998). For instance, Lipton et al. (1998), found that practitioners agreed that low reading rates, absence of English proficiency, and excessive respect for physicians hindered interactions with patients.

It appears that different approaches could be applied to reduce some of the challenges. For instance, the American Diabetes Association (2015), notes that diabetes patient care should be aligned with the Chronic Care Model (CCM) elements to guarantee productive interactions between a ready and proactive practice team and an informed enabled patient. Another approach is how the application of technology could help to enhance effective communication in order to address some of the problems encountered (Kruse, Argueta, Lopez, & Nair, 2015). Kruse et al. (2015) concluded that patient portals show important improvements in patient self-management of chronic disease and enhance the quality of care provided by providers indicating that patient-provider communication was the most common beneficial characteristic.

Patients' involvement in decision making

It appears that in most cases, patients are not involved in the decisions concerning their care (Couët et al., 2015). For instance, Couët et al. (2015) showed that specifically, behaviours that required tailoring care to patient preferences were attempted even less consistently across studies

(Couët et al., 2015). In addition, studies show that while health- care providers claim they are receptive towards SDM, they appear to dislike many of their patients' attempts to engage in shared decision making (SDM) (Hamann et al., 2012; Couët et al., 2015). Couët et al. (2015) conclude that whatever the clinical context, few health- care providers consistently attempt to facilitate patient involvement, and even fewer adjust care to patients' preferences.

However, the current thinking is that patients should be involved in the decisions that affect their health – it would encourage them to step up their responsibility for the diabetes self-management practices (Ahola, & Groop, 2013). Ahola and Groop (2013) explain this better by noting that individuals with diabetes have a significant responsibility to manage their chronic condition on a regular basis. Couët et al. (2015), suggest that both shared decision making (SDM) interventions and longer consultations could improve this. To ensure that patients are involved in the decision regarding their care, the American Diabetes Association (2015) recommends that healthcare providers should use patient-centered communication that includes patient preferences, assesses literacy and addresses cultural barriers.

2.2.4. Community related factor (Social support)

This section presents literature on social support that could associate with diabetes self-management. The cultural context within which diabetes self-management is provided has an influence on the success of using it as a strategy to reduce the effect of diabetes condition (see Brown, Garcia, Kouzekanani, & Hanis, 2002). Despite the reason that there are so many socio-cultural determinants that may associate with patients' decision to practice diabetes self-management, the prominent element used in this anlaysis is social or family and friends' support (see Fort et al., 2013).

It should be observed that patients live in communities and as such the socio-cultural characteristics of their communities may have an influence on what they do, including their decision to practice diabetes self-management (Brown et al., 2002). For instance, Brown et al. (2002), reported that the results shown at the end of an intervention disclosed indicators of metabolic control (HbA1c and fasting blood glucose), diabetes knowledge, and diabetes related health beliefs when the strategy used was culturally competent in terms of language, diet, social emphasis, family involvement, and integration of cultural health convictions,

It is believed that patients will be able to adhere to diabetes self-management (especially, treatment plan, emotions and motivation) if they have social support, especially from their family and friends. This could be classified as part of social determinants of health, which is defined to include the social and economic conditions that influence health status (Fort et al., 2013). Fort et al. (2013), provide the evidence that, in enabling self-care activities in diabetic patient social support could be regarded as beneficial a contributor - social determinants were found to have an effect on glycemic control, LDL, and blood pressure to varying degrees.

However, a negative contributor of social support was found where among the Mexican-Americans, achieving glucose control reportedly was even more difficult, because these people were more likely to depend on family and curanderos (folk healers) for health advice, to be isolated from mainstream culture, to consider family requirements as more important than their own personal requirement and to experience differences in language with health care workers (Lipton et al., 1998).

It is anticipated that providing patients emotional support and motivation would encourage them to comply with the diabetes self-management practices. A view expressed was that emotional

barriers to appropriate treatment, even among low-income patients, were often more crucial than economic issues, and fear of insulin therapy was expressed in Hispanic communities, leading to patients patronising in folk remedies (Lipton et al., 1998). Lipton et al. (1998), explained that this was so because family needs were deemed to be the most important, assuming that adherence to a treatment regimen might be deemed as self-indulgent - families offered valuable assistance and emotional support.

2.3. Theoretical Underpinning

In Social Cognitive Theory (SCT), self-efficacy was proposed as a key variable (Bandura, 1977; Bandura, 1997; Peng, 2008). Self-efficacy is "beliefs in the effectiveness of having control over one's performance and activities affecting one's life (Bandura; 2004; Peng, 2008). Peng (2008) notes that self-efficacy is the basis of human motivation and achievements because it impacts every fundamental processes of personal change. The idea is that unless people believe that they can produce desired effects by their actions, they have little incentive to act for behaviour change. Peng (2008) shows the view that self-efficacy also influences whether individuals are mobilizing the perseverance they need to succeed, their ability to recover from mistakes, and how well they maintain the improvements in habits they have accomplished.

Bandura (1977) discussed an integrative theoretical framework for explaining and predicting psychological changes obtained through various treatment methods. This theory says that psychological processes change level and strength of self-efficacy, whatever their form. The argument is that personal efficacy expectations determine whether a coping behaviour will be initiated, how much effort will be spent, and how long it will last in the face of barriers and aversive experiences (Bandura, 1977). Bandura and Adams (1977) examined the premise that

systematic desensitization effects change in avoidance behaviour by creating and strengthening expectations of personal efficacy. Bandura (1977) contends that persistence in activities that are subjectively threatening but actually relatively safe leads to improvement of self-efficacy and corresponding reductions in defensive behavior through mastery experiences. Bandura and Adams (1977) also noted that microanalysis of congruence between self-efficacy and performance showed in accordance with the forecast, that self-efficacy was an extremely precise predictor of the degree of behavioural change following full desensitization.

Bandura (1977) proposed that, personal efficacy expectations were derived from four main sources of information namely; performance accomplishments, vicarious experience, verbal persuasion, and physiological states. Bandura and Adams (1977) found that perceived self-efficacy mediated anxiety arousal. Similarly, factors influencing the cognitive processing of efficacy information emerged from enactive, vicarious, exhortative, and emotive sources – there was a connection between perceived self-efficacy and behavioral modifications (Bandura, 1977).

Peng (2008) explains that an enactive experience is a direct learning experience in which one effectively operates in an activity within a true physical environment. That is, through enactive experience, individuals develop self-efficacy by examining the outcomes patterns they have encountered directly and then create behavioral concepts and rules (Peng, 2008). Bandura and Adams (1977) studied efficacy and behavioral change process during the course of treatment and discovered that self-efficacy was a superior predictor of amount of behavioural enhancement phobics obtained from partial threats control at different treatment stages.

The application of this theory in the current study was to help explain how perceived self-efficacy could lead to behavioural change in the diabetes patients attending the Greater Accra Regional Hospital in their efforts at adhering to the diabetes self-management practices.

2.4. Conceptual Framework

The conceptual framework of the factors associated with diabetes self-management practices (self-care activities) has been shown in figure 2.1. It would be recalled from literature and theoretical perspective of self-efficacy that diabetes self-care activities include regular exercising, blood sugar testing, healthy eating, foot care (foot examinations at regular intervals), smoking and medication adherence (Nam, Chesla, Stotts, Kroon, & Janson, 2011). From the framework, it is argued that these are influenced by patients' (socio-demographic characteristics) factors such as age, sex, level of education, socio-economic status/level of income, and marital status.

In addition, knowledge of diabetes and self-management is also an influential variable. Smalls et al. (2012), note that there is an association between diabetes knowledge and medication adherence, exercise, blood glucose monitoring and foot care. A person's knowledge of what diabetes is, its complications and how bad the complications are, what could be done to control it will somehow motivate them to take actions to reduce the burden of the disease.

In addition, the framework shows that healthcare provider factors are also important in influencing diabetes self-management. Thus, type of patient provider communication, understanding of diabetes self-management provided to patients by clinicians and the involvement of the patient in decision-making concerning their health have an influence on diabetes self-management practices.

Furthermore, the framework suggests that community factors have an association with patients' decision to adhere to diabetes self-management practices. For the purposes of this discussion, social/family and friends' support were considered. It means that depending on the type of social-family support available to diabetes patients, their adherence may be enhanced or otherwise accordingly.

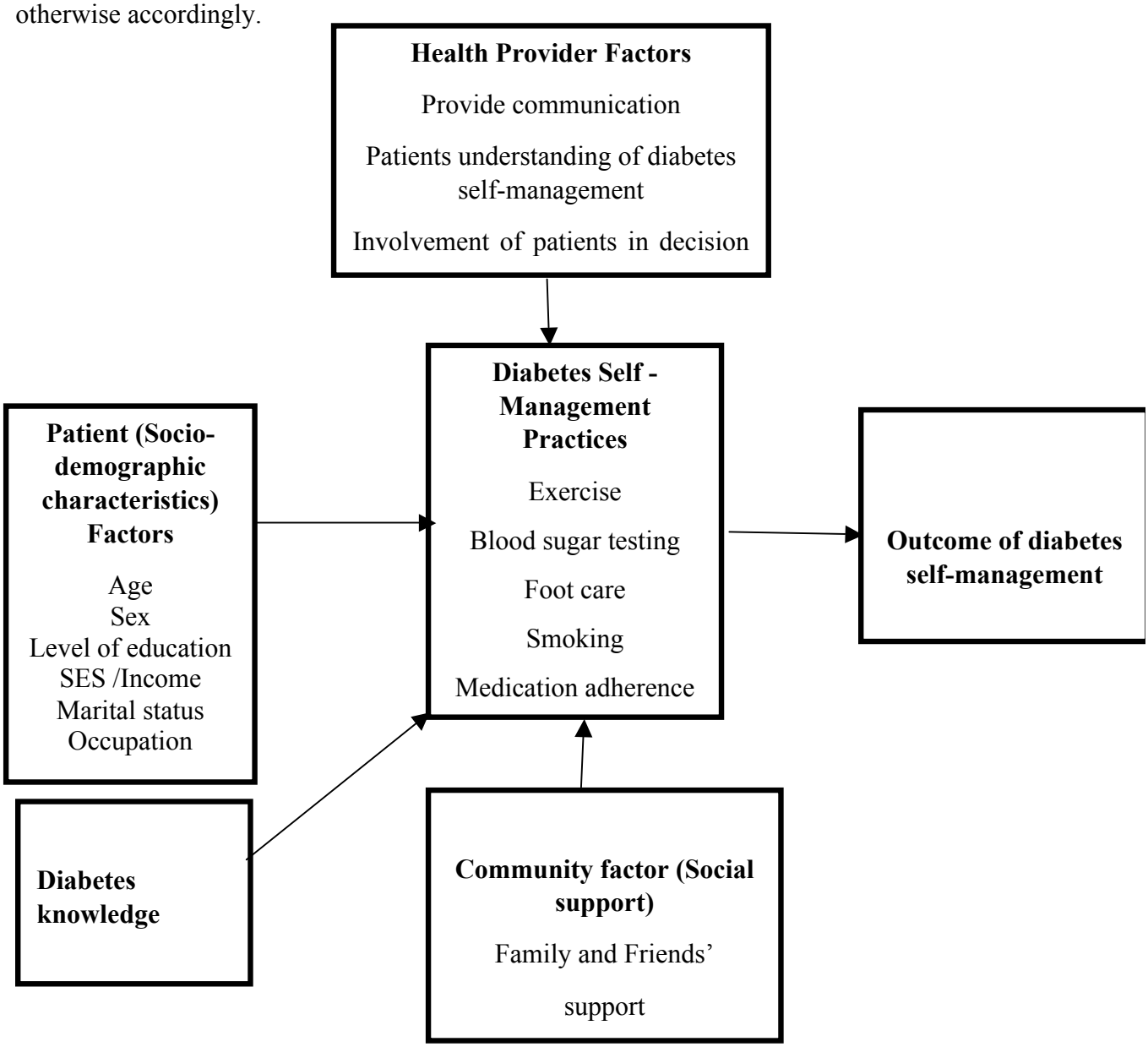

Figure 2.1: Conceptual framework of diabetic self-management practices. Source: Researcher's own conception based on literature and self-efficacy theory (Bandura, 1977, 1997).

2.5. Gaps in the literature

After a careful analysis of existing literature on the topic under discussion, it was found that there were some gaps that had to be filled. Norris, Engelgau, and Narayan (2001) recommended that even as evidence supports the effectiveness of diabetes self-management training, especially in the short term, further study was needed to assess the effectiveness of self-management interventions on diabetes self-care practices and sustained glycemic control. Gao *et al*. (2013), also suggested that longitudinal studies were required to investigate the effect of self-efficacy, social support and PPC on changes in diabetes self-care practices and glycemic control.

Despite these admonitions, it appeared that no such study had been conducted to establish how patients would accept to conform to diabetes self-management practices at the Greater Accra Regional Hospital. Hence, this study was meant to take this up by studying patient (socio-demographic characteristics) factors, healthcare provider factors and socio-cultural/social support factors that could associate with diabetes self-management practices amongst patients attending the Diabetic Clinic of the hospital so as to fill the gap in knowledge in the literature.

2.6. Chapter summary

This chapter has provided some analysis of the extant literature on the topic of diabetes, diabetes self-management and factors that could associate with diabetes self-management practices.

CHAPTER THREE
METHODS

3.0. Introduction

This chapter outlines the methods and procedures that were employed to obtain and analyse data in the study of factors associated with diabetes self-management among diabetes patients attending GARH. There are eight sections in this chapter. Section one presents the study design. Section two presents the study location. Section three presents the study population. Section four presents the study variables. Section five presents the sampling method and sample size determination. Section six presents the data collection and analysis. Section seven presents the ethical considerations. Section eight presents the summary of the chapter.

3.1. Philosophical perspective

The choice of the research method was based on the researcher's philosophical assumption as a positivist (Kaboub, 2008). Kaboub (2008, p343) explains that the positivist paradigm asserts that real events could be observed empirically and explained with logical analysis. Since the positivist tradition usually adopts a quantitative research method, it was considered important in this study. This paradigm was adopted since the study was based on assessing the association between factors that enhance adoption and compliance with diabetes self-management practices among patients at the Greater Accra Regional Hospital in Accra, Ghana using a survey instrument. On the basis of the philosophical assumption, the following discussed quantitative research method was adopted for the study.

3.2. Quantitative research method

The quantitative research method was adopted as opposed to the qualitative research method in view of the philosophical assumption of the researcher. Jupp (2006) shows the view that quantitative research method involves the collection of data in numerical form for quantitative analysis. The reason for the choice of the quantitative research method instead of qualitative method was based on the fact that this research method assisted the researcher to quantify the views collected from diabetic patients attending the GARH on the diabetes self-management strategy. Using a qualitative research method would not have provided the opportunity to quantify these views. On the basis of the philosophical assumption and the choice of a quantitative research method, the following discussed research design was adopted for the conduct of the study.

3.3. Study design and strategy

The study employed a cross-sectional quantitative study design. Mamn (2003) indicates that a cross-sectional study allows measurement on each item to be made at one point in time, hence, data is collected only once and allows for several outcomes to be studied. Additionally, the researchers explains that the cross sectional study is fast and cheap with no need to follow up (Mamn, 2003). The investigator therefore, chose the cross-sectional study design because the study sought to gather information on diabetes patients' self-management practices and factors associated with it at one point in time which helped in drawing quantifiable inferences. The investigator also chose the cross sectional study design which is fast and inexpensive based on the limited time and resources for the study.

3.4. Study Area

The study was conducted at the Diabetic Clinic of the Greater Accra Regional Hospital (GARH) in the Greater Accra Region of Ghana. GARH is located in the Accra Metropolitan Assembly (AMA), precisely the Osu Klottey Sub-Metropolitan Assembly with nine (9) electoral areas namely, Osu Doku, Ringway Estate, Kinkawe, Osu Alata, Asylum Down, North Adabraka, Tudu, Odaw-Naa, and Official Town (AMA, 2018). The choice of the AMA was based on the following discussed - demography, economy and healthcare provision and human resources.

Demography

The population of AMA according to the 2010 Population and Housing Census was 1,665,086 representing 42% of Greater Accra Region's total population (Ghana Statistical Service, 2012). The sex ratio of the metropolis was 93 with 48% males and 51.9% females. AMA has a youthful population with about 42.6% being children under 15 years and 5.9% representing 60 years and older.

Economic Activity

The census report had it that majority (70.1%) of the population who were 15 years and older were economically active whereas 29.9% were economically inactive (Ghana Statistical Service, 2012). The report had it that out of those who were economically active, 93% were employed, and most of the economically inactive population were students (52.1%). About 3.1% were disabled or too sick to work. It must be noted that AMA hosts a number of manufacturing industries, financial institutions, education, health institutions and other important establishments. These institutions offer employment opportunities to residents of Accra. Their

presence continues to attract people from all parts of the country and beyond to transact various businesses (Ghana Statistical Service, 2012).

The Ghana Statistical Service (2012), reports that in terms of occupation, majority (38.5%) of the population were into service and sales, followed by craft and related trade (20%). It was reported that about 17.2% constituted managers, professionals and technicians, and only about 1.7% comprised people with skills in agriculture, forestry and fishery. Most of the population aged 11 years and older representing 89% was literate and 52% could speak and write English and Ghanaian languages (Ghana Statistical Service, 2012).

Healthcare provision

The Accra Metropolitan Assembly (AMA) Health Services has identified essential health-related challenges and needs for Accra, in two primary areas: physical health structures and issues related to adequate staffing and data reporting (Pehr, 2010). Pehr (2010) explains that Accra faces the challenges of inadequate emergency care, infrastructure and equipment, and a lack of office and residential accommodation for health professionals. There are critical physical challenges at the hospitals themselves, and many units lack an adequate number of beds and specialty services. Furthermore, AMA Health Services highlighted the severely low number of experienced health professionals in the city: the doctor to patient ratio is 1:12,000 and the nurse to patient ratio is 1:1,837 (Pehr, 2010). Given this healthcare background, the study site was appropriately chosen as described below.

3.4.1. Study Site

The Greater Accra Regional Hospital (GARH) is an ultra-modern facility with a bed capacity of 620 and provides healthcare services to the whole of Greater Accra Region with an estimated

population of 4,283,322 (Ghana Statistical Service, 2012). Its immediate catchment area includes Nima, Maamobi, Kanda, Accra new town, Kotobaabi, Osu, La, Adabraka, Achimota, Airport Residential Area and Central Accra. It is a regional referral centre and accepts referrals from all parts of the region and provides a wide range of services. These include surgical, medicine, obstetrics and gynecology, accident and emergency services, pharmacy, radiology, laboratory services as well as the diabetic clinic (which runs every Tuesday with about forty(40) to fifty(50) attendants).

3.5. Study Population

The study population involved both male and female diabetic patients attending the Diabetic Clinic of the Greater Accra Regional Hospital. That is, all patients who were available during the period of data collection were eligible to be included in the study.

3.5.1. Inclusion criteria

The following were used as basis for inclusion:

Patients with diabetes who were 18 years and above attending the diabetic clinic.

Patients with diabetes should have attended the diabetic clinic for at least one month (by which time, the person should have at least received some education of Diabetes self-management).

Patients with diabetes who gave their informed consent participated in this study.

3.5.2. Exclusion criteria

The following were used as basis for exclusion:

Patients with diabetes who were less than 18 years.

Patients with diabetes who were attending the diabetic clinic for the first time or less than a month.

Patients with diabetes who were unwilling to give their informed consent.

3.6. Sampling method

It was assumed that all diabetic patients attending the Diabetes Clinic of the GARH at the time of data collection had an equal chance of being included in the study. Therefore, patients who presented at the diabetes clinic on each day of data collection were randomly selected using the balloting method. This means that pieces of papers were used on which 'yes' and 'no' were written and put in a bowl. Patients who picked 'yes' were included after they had provided informed consent whereas those who picked 'no' were not included. To sum up, a simple random sampling procedure was used to sample diabetes patients who attended the clinic on weekly basis. This strategy was repeated until the desired sample size was achieved over a period of about six weeks.

3.6.1. Sample size Calculation

The sample size of the study was calculated using the Cochran formula for quantitative sample size determination, [$N = z^2 (Pq)/d^2$]

Where;

N = minimum sample size

z = the critical probability value for confidence level of 95% (1.96),

p = estimated proportion of participants with good self-care practices being 15.1% (Yekta *et al.*, 2011)

q = 1-p

d = margin of error (0.05)

A minimum sample size of 197 was arrived at for the study.

3.7. Study Variables

The variables measured in the study have been grouped into two: dependent and independent as shown below.

3.7.1. Dependent Variable

The dependent variable was self-management practices of diabetes. (Exercise, blood sugar testing, smoking, medication adherence, foot care)

3.7.2. Independent Variables

The independent variables measured included the following:

Patient (Socio-demographic/economic) factors: Age, marital status, educational level, level of income and sex.

Knowledge of diabetes: patients knowledge on diabetes.

Health provider factors: provider communication, how well health care providers help patients' understanding of diabetes self-management, involvement of patients in decision making.

*Community related factor: Social (*Family & Friends) support

3.8. Data Collection – Questionnaire design and administration

Empirical data for the study was gathered in the months of May-June, 2019. A structured questionnaire was used as the main instrument to collect information and divided into four main sections. The section 'A' sought information from participants on the patient (socio-

demographic/economic characteristics) factors such as sex, age, level of education, marital status, occupation, income.

Section 'B' sought information on patients' knowledge of DM. This was measured using an adapted 'Patients Diabetes Knowledge Questionnaire' (Michigan Diabetes Research and Training Center, 1998). This is a Likert scale type with a 23 item test where each question has three responses (true, false and don't know). It means that 'true' represents a correct answer while 'false and don't know' represent wrong answers. Each correct response was awarded one mark. The total score for each participant ranged from zero to twenty three and a higher score indicated higher diabetes knowledge. Some of the items in the questionnaire include: 'in untreated diabetes, the sugar level in the blood usually increases', and 'diabetes can be cured'. An index variable comprising of scores from Diabetes knowledge was generated. This was further categorized using 25th (score below 11) 50th (score between 12-13) and 75th (score 20 and above) percentile which were recoded into 1 "Poor" 2 "Average" and 3 "Good" respectively..

The section 'C' of the questionnaire covered the self-management (self-care practices), which was measured by adapting the Summary of Diabetes Self-Care Activities (SDSCA) Questionnaire (Toobert & Glasgow, 1994). This is a Likert scale type with 11-item questionnaire, which contains questions on diet, exercise, blood sugar monitoring, foot care, and medication. Some of the questions include: 'on how many of the last seven days did you check your feet', 'on how many of the last seven days did you participate in at least 30 minutes of physical activity' and 'on how many of the last seven days did you take your recommended number of diabetes pills'. That is, a seven-point Likert response format was used for all domains with responses to each item raging from zero to seven. An index variable comprising of scores from SDSCA questions was generated. The scores for participants in this study ranged from 6-

71. To achieve the study objective one which is to determine the level of diabetes self-management practices, further classification were done to categorize SDSCA scores. The categorization were done using the 25th (score below 39), 50th (score between 39-49) and 75th (score 50 and above) percentile which were recoded into 1 "Poor" 2 "Moderate" and 3 "High" respectively. However, to determine associations the raw scores were used in order to avoid bias which would have masked true associations if the categorised data was used.

The section D collected information relating to the healthcare provider factors. Healthcare provider factor such as provider communication and how well health care providers helped patients understanding of diabetes self-management was assessed by using the patients' satisfaction with the provider communication (PCOM), and patients'satisfaction with how well their health care providers helped their overall understanding of the Diabetes self-management activities while patients involvement in decision making was measured using the patient provider participatory decision making style (PDM STYLE). These survey questions were adapted from a study, which looked at the relative importance of physicians' communication, participation in decision making, and patients' understanding of Diabetes self-management (Heisler, Bouknight, Hayward, Smith, & Kerr, 2002).

The provider participatory decision making style is a 4-item scale, which contains statements like 'how often health care providers offered them choices in their medical care and took their choices into account when making treatment options'. The questions were rated on a five point likert scale, which ranged from zero, which implies 'none of the time' to four, which implies 'all of the time'. An index variable comprising of scores from Provider decision making style were also categorized using 25th (score below 26), 50th (score between 27-30) and 75th (score 31 and above) percentile which were recoded into 1 "Low" 2 "Moderate" and 3 "High" respectively

For patients' satisfaction with provider communication (PCOM), a 5-item scale, Participants were asked questions like 'how health care providers faired in terms of: telling them their test results when promised, explaining the treatment alternatives, explaining the side effects of the medication etc. Respondents' answers ranged from zero, which implies 'poor; to four, which implies 'excellent'. An index variable comprising of scores from PCOM were categorized using 25th (score below 15), 50th (score between 16-19) and 75th (score 20 and above) percentile which were recoded into 1 "Poor" 2 "Moderate" and 3 "high" satisfaction respectively.

Overall, patients' understanding of the domains of diabetes self-care activities was measured using a 7-item scale, which includes questions/statements like how satisfied patients were in terms of how well their health care providers helped 'patients' understanding of how to care for the feet, how and when to test blood sugar, among others. Valid answers ranged from zero, which implies 'poor; to four, which implies 'excellent'. An index variable comprising of scores from Patient understanding of diabetes self-care management were also were categorized using 25th (score below 4), 50th (score between 5-6) and 75th (score 7 and above) percentile which were recoded into 1 "Low" 2 "Moderate" and 3 "High" satisfaction respectively

The section E measured variables such as social support using the social support scale, which is a subscale of the diabetes care profile (DCP) developed by Fitzgerald and colleagues (Fitzgerald *et al*., 1996). It consists of two questions - one on 'social support received', and the other on 'social attitude'. Each question is made up of six items, which are labelled a-f, making a sum of 12 items. Some of the questions/statements are 'my family or friends help and support me to follow my meal plan', 'my family or friends encourage and reassure me about my diabetes'. Each response was measured on a 6-point Likert scale, which ranged from 'strongly agree' to 'does not apply'. An index variable comprising of scores from social support scale were also were

categorized using 25th (score below 40), 50th (score between 40-45) and 75th (score 46 and above) percentile which were recoded into 1 “Low” 2 “Moderate” and 3 “High” respectively.

The questionnaire as designed and outlined was administered using both the self-administration and interviewer-administered strategies. For participants who could read and write in the English language, the questionnaires were self-administered by them. For patients who could not read and write in the English language, the two research assistants helped them to answer the questions using the interviewer-administered strategy. Two research assistants were trained on the objectives of the study and how to explain the concepts to participants before the data collection. Each questionnaire was answered within 30 minutes (see appendix B).

3.9. Data analysis

The returned questionnaire were checked for completeness and entered into Epidata version 3.1 and exported into Stata version 15 for statistical analysis. Two approaches of data analysis were performed which involved descriptive and inferential analysis. Descriptive analysis involved summary and cross-tabuation to assess proportion of independent variables against dependent variable. Inferential analysis involved pairwise Correlational analysis, which was performed to assess the relationship between dependent variable and independent variables. Linear regression involving univariate and multivariate analysis were also performed to determine significant factors that influence SDSCA. In linear regression estimations, robust standard error were considered. The level of significance was accepted where the *p*-value was $p < 0.05$ at 95% confidence level. For the purpose of reliability in measuring the quality of SDSCA scale questionnaire, Cronbach alpha analysis was performed to assess the overall test of reliability using α which was 0.7 in this study, which implies that it is reliable.

3.10. Ethical Consideration

In adhering to the issues of ethics involved in the research (see Aguinis, & Henle, 2002), the following enumerated steps/activities were carried out.

Ethical Clearance

Before the beginning of the study, ethical approval was granted by the Ghana Health Service Ethical Review Committee (GHS- ERC) with reference number: GHS- ERC008/12/18.

Approval from study area

A written permission seeking to use the Greater Accra Regional Hospital for the study was sent to the administration of the Greater Accra Regional Hospital and also the In-charge of the diabetic clinic of the hospital. Permission was equally sought from the Greater Accra Regional Health Directorate and the District Health Directorate of the Osu-Klottey Sub-Metro within which the facility is located. The following activities were performed in order to make sure that ethical issues were addressed in the study.

Participants' Consent

The consent of any patient who participated in the study was sought prior to their inclusion in the study. Individuals who were qualified for the study were enrolled in the study only after they had endorsed a written informed consent/assent form, either by signing or thumb-printing before they responded to the items on the questionnaire (see appendix A).

Quality assurance / Pre-testing

The questionnaire was pre-tested among patients with diabetes who were 18 years and above in diabetic clinic of Korle-Bu Teaching Hospital, which was comparable with the study area and with similar characteristics as those who were recruited in the actual study. This was to ensure that the questionnaires were easily understood and well framed. The questionnaire was later

updated and retested prior to the actual study. In addition, the research assistants were trained well on the objectives of the study, appropriate data collection skills and data entry to ensure accuracy of data collected.

Chapter summary

The chapter has presented the methods that were applied to collect empirical data for analysis in the current study. The philosophical position based on which the choice of methodology was based has been demonstrated as well. The next chapter presents the findings of the empirical study.

CHAPTER FOUR
RESULTS

4.0. Introduction

This chapter presents the results obtained from analysis of the quantitative data. The chapter is divided into sections, including the following presented. Section one presents the socio-demographic characteristics of diabetes patients. Section two presents the level of diabetes knowledge among diabetes patients. Section three presents the health provider communication assessment among diabetes patients. Section four presents diabetes self-management practices. Section five presents correlation between health provider factors, social support, diabetes knowledge, individual domains as well as SDSCA. Section six presents linear regression on factors associated with diabetes self-management. Section eight presents the chapter summary where the main ideas have been summed up and a projection made into what the reader should expect in the next chapter.

4.1. Socio-demographic characteristics of diabetes patients

This section presents the descriptive statistics or socio-demographic characteristics of the respondents. In all, 198 diabetic patients were involved in the study. The age of the patients ranged from 32 years to 88 years with a mean of 58.7 ± 10.7 years. The results showed that majority of the patients were female, 75.2% while males were 24.8% with majority within age group 50-59 years, 31.3%. Most of the participants were married, 54.6% and patients with diabetes who had elementary educational level were 30.3%. Unskilled workers were 43.9% and those who earn below Gh¢200 among the patients with diabetes were 37.9%.

Table 4.1: Demographic characteristics among diabetes patients

Demographic variable	Frequency (198)	Percentage
	N	%
Sex		
Male	49	24.8
Female	149	75.2
Age group		
<=49 (Min=32 years)	44	22.2
50-59	62	31.3
60-69	61	30.8
70+ (Max=88years)	31	15.7
Mean(SD)	58.7±10.7	
Marital status		
Single	18	9.1
Married	108	54.6
Widowed	52	26.3
Divorced	20	10.1
Level of Education		
No formal education	37	18.7
Elementary	60	30.3
JHS	49	24.8
SHS/secondary	31	15.7
Tertiary education	21	10.6
Occupation group		
Skilled	31	15.7
Unskilled	87	43.9
Unemployed	80	40.4
Level of Income Gh₵		
≤ 199.00	75	37.9
200.00- 499.00	55	27.8
500.00- 999.00	27	13.6
1000.00- 1999.00	21	10.6
≥2000.00	20	10.1

Source: Field Data (2019).

4.2.2. Level of diabetes knowledge among diabetes patients

The results in figure 4.1, show the prevalence of diabetes knowledge assessed among the diabetes patients, showing 95% confidence interval. Overall, the prevalence of good diabetes knowledge was 20.7% with more having average knowledge of diabetes (50.0%). (See Appendix C descriptive statistics of diabetes knowledge among diabetes patients)

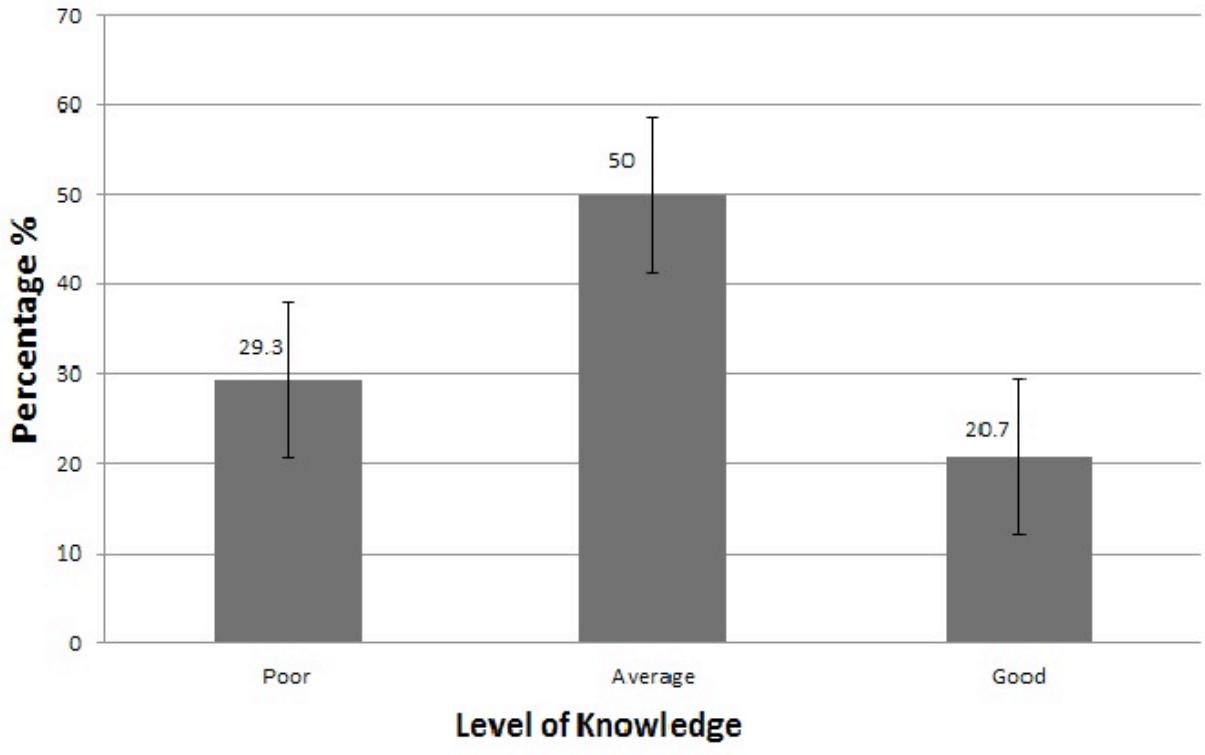

Figure 4.1: Level of diabetes knowledge among diabetes patients. Source: Field Data (2019).

4.3. Health provider factors

This section presents results relating to the health provider factors with sub-headings such as health providers' communication assessment among diabetes patients, understanding of diabetes

self-care management assessment among diabetes patients, and patient involvement in decision making assessment among diabetes patients.

4.3.1 Overall health providers' communication assessment among diabetes patients

Results of the overall health providers' communication assessment among diabetes patients showing 95% confidence interval are presented. Overall satisfaction with healthcare providers' communication in relation to diabetes treatment showed a minimal of 31.3% was fully satisfied the provider communication while 52.5% was moderately satisfied with health providers' communication. There was a significant difference of the prevalence rate in the level of health providers' communication as indicated by 95% CI error bar. (See appendix D for descriptive statistics of diabetes patients assessment of health provider communication)

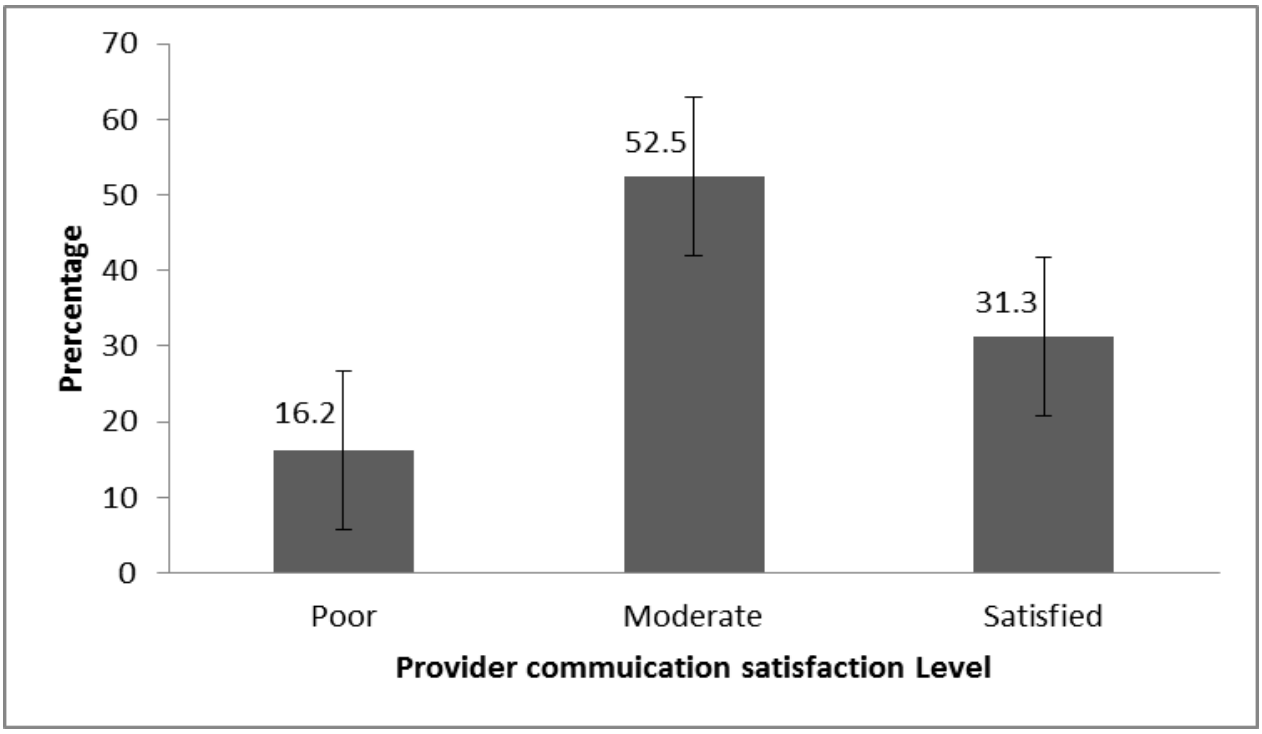

Figure 4.2: Overall health providers' communication assessment among diabetes patients. Source: Field Data (2019).

4.3.2 Overall satisfaction with how health care providers helped patients understanding of diabetes self-care management assessment among diabetes patients

The overall satisfaction of how health care providers helped patients understanding of diabetes self-care management assessment among diabetes patients was measured at 95% confidence interval. The results of diabetes patients' assessment of satisfaction with healthcare providers' involvement in helping them understand diabetes self-management showed a low satisfaction rate (27.8%) as 48.5% was moderately satisfied. There was a significant difference of the prevalence rate in the level of satisfaction of how well health care providers helped patients understanding of self-care management as indicated by 95% CI error bar. Figure 4.3 outlines the results of overall satisfaction of how well health care providers helped patients understanding of diabetes self-care management assessment among diabetes patients. (See appendix E for assessment of patients understanding of diabetes self-management among diabetes patients)

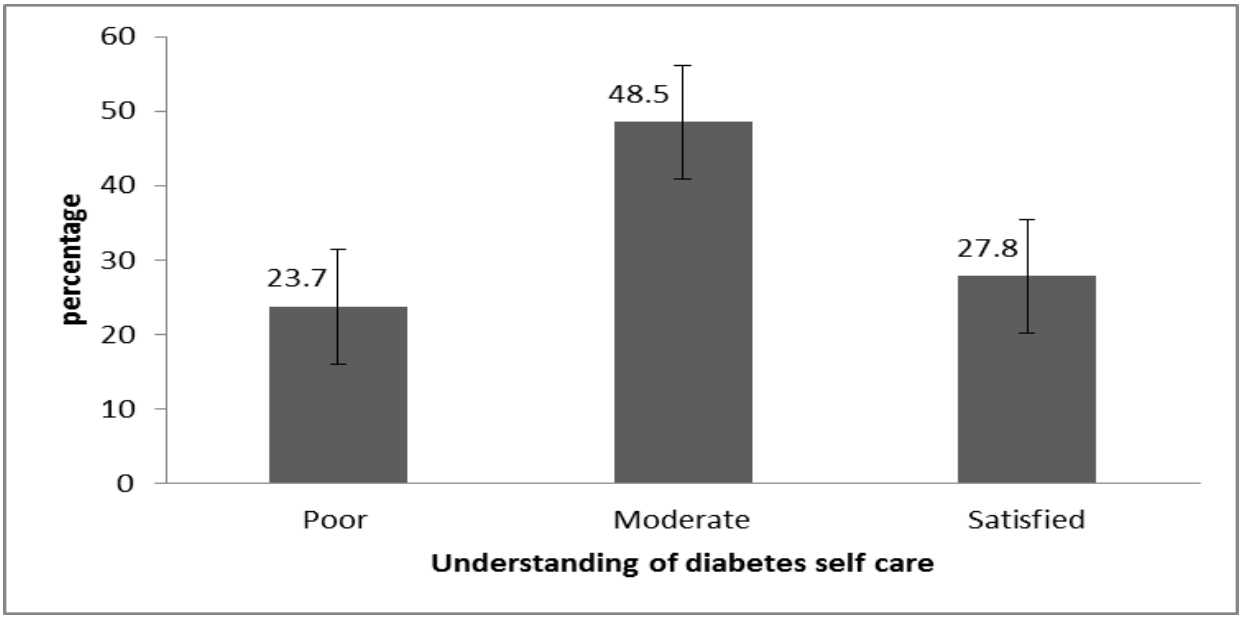

Figure 4.3: Overall satisfaction with how well health care providers helped patients understanding of diabetes self-care management assessment among diabetes patients. Source: Field Data (2019).

4.3.3. Overall Patient involvement in decision making assessment among diabetes patients

The overall patient involvement in decision making was also assessed among the diabetes patients at 95% confidence interval. The results indicated that patient involvement in decision making was high among only 7.6%. In addition, it revealed that moderate and low level of patient involvement in decision making were 21.7% and 70.7% respectively. There was a significant difference of the prevalence rate in the level of patient involvement in decision making as indicated by 95% CI error bar. Figure 4.4 shows the overall patient involvement in decision making assessment among diabetes patients. (See appendix F for descriptive statistics on patients' involvement in decision making assessment among diabetes patients)

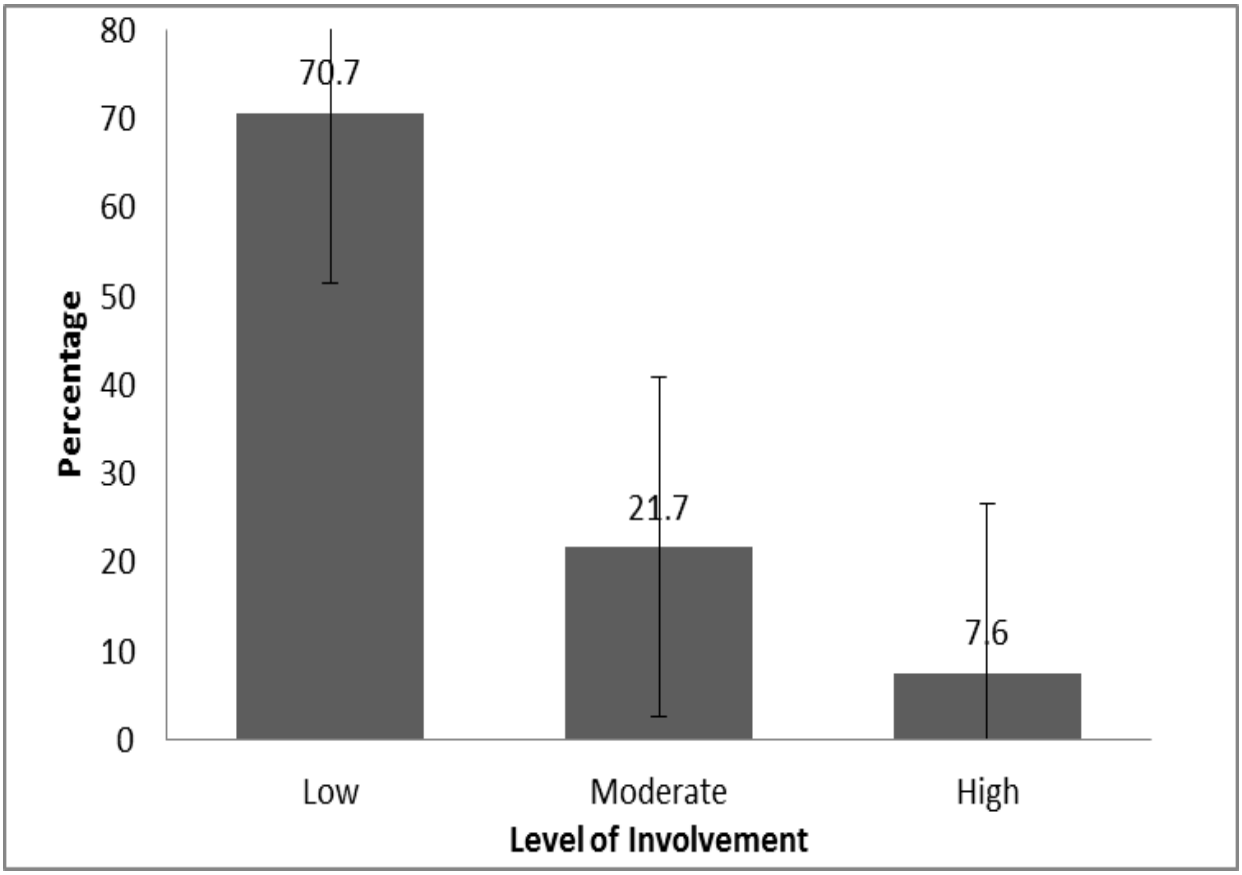

Figure 4.4: Overall Patient involvement in decision making assessment among diabetes patients. Source: Field Data (2019).

4.3.4. Overall social (family and friends)support assessment among diabetes patients

The overall family and friends social support was assessed among the diabetes patients at 95% confidence interval. The results indicated that overall social support was high in about 43.4%, with 34.9% experiencing moderate social support. However, the difference of high and moderate support was not statistically significant as predicted by 95% CI error bar. Figure 4.5 outlines results of the overall social (family and friends) support assessment among diabetes patients. (See appendix G for descriptive statistics on social support assessment among diabetes patients)

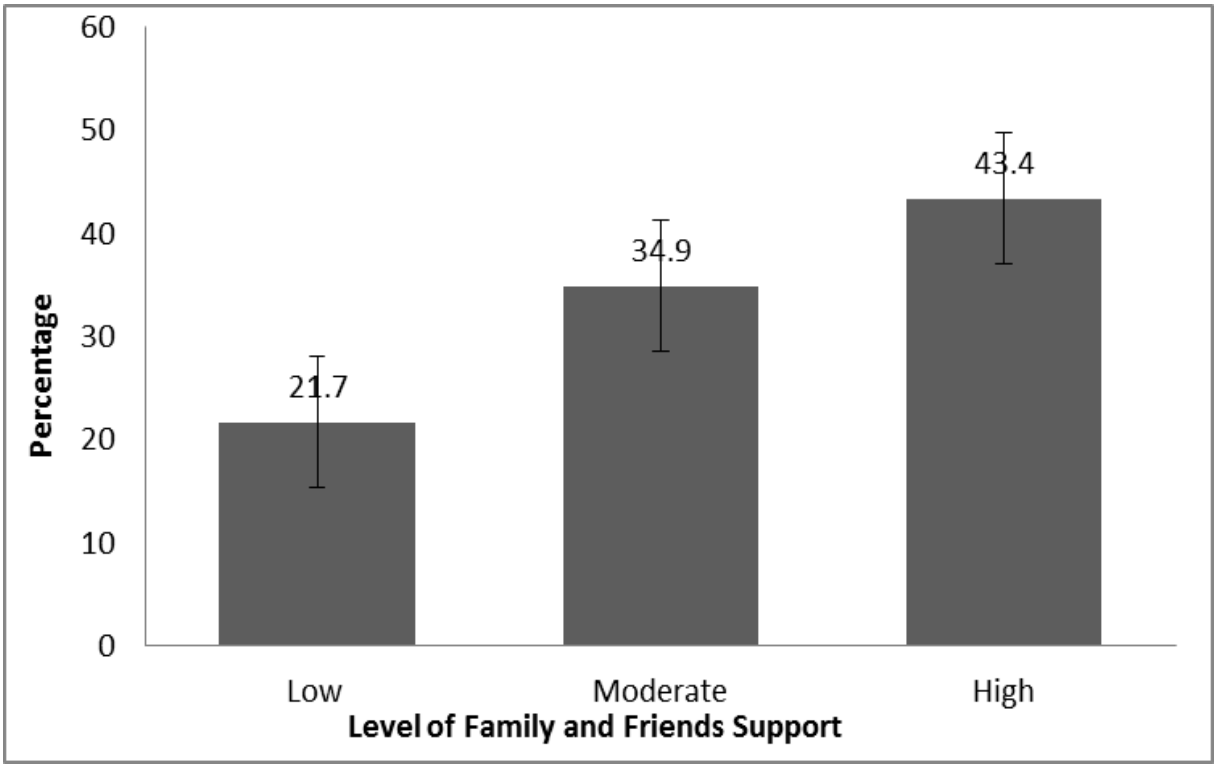

Figure 4.5: Overall social (Family and friends) support assessment among diabetes patients. Source: Field Data (2019).

4.4. Diabetes self-management practices

This section presents the results relating to the diabetes self-management with sub-heading of summary of SDSCA sub-heading, overall SDSCA score level assessment among diabetes patients,

4.4.1. Summary of SDSCA and overall SDSCA score level assessment among diabetes patients

Figure 4.6 presents the Summary of SDSCA sub-heading and overall SDSCA score level assessed among diabetes patients at 95% confidence interval. The results showed that overall, diet plan (27.8%), exercise plan (25.8%), blood sugar testing (32.8%), foot care (25.8%) and medication scores (82.8%) were high. However, the overall SDSCA showed a prevalence of 25.2% high scores. Figure 4.6 depicts results of the summary of SDSCA and overall SDSCA score level assessment among diabetes patients.(See appendix H for descriptive statistics of level of diabetes self-care practices among diabetes patients)

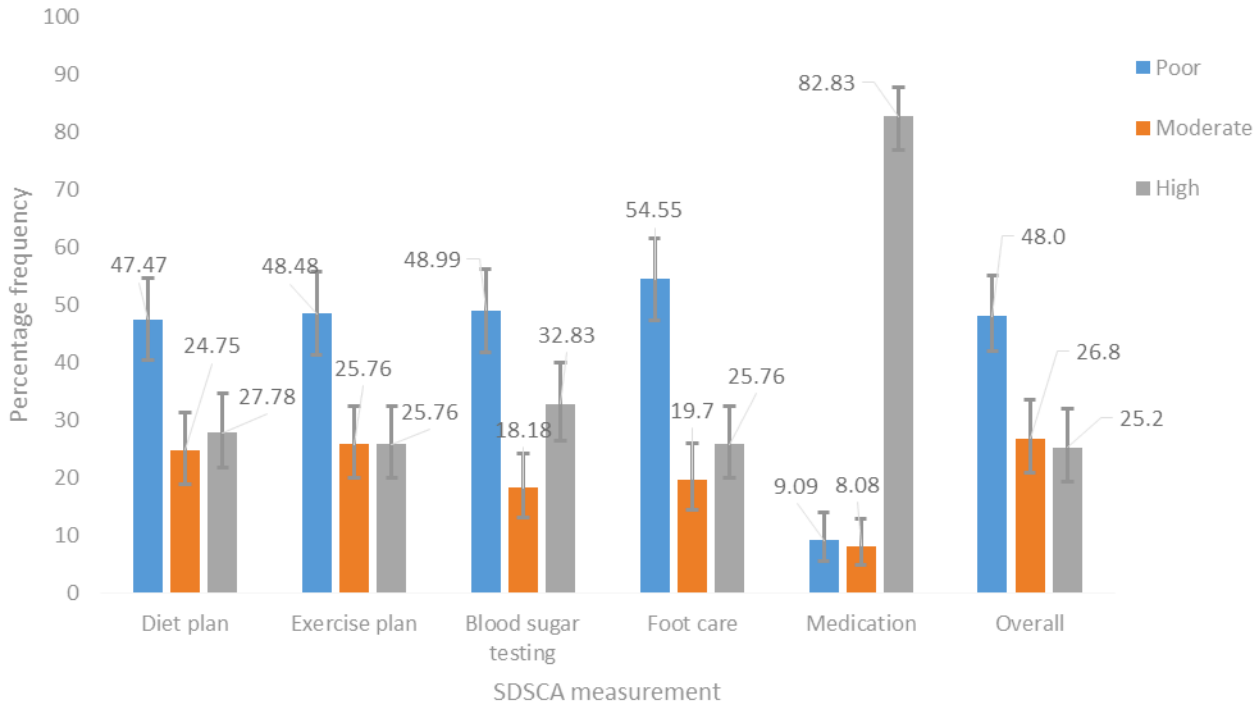

Figure 4.6: Summary of SDSCA and overall SDSCA score level assessment among diabetes patients. Source: Field Data (2019).

4.5. Correlation between health provider factors, social support, diabetes knowledge and individual domains as well as overall SDSCA (diabetes self-management practices)

This section presents the correlation between health provider factors, community related factors and diabetes self-management. The sub-headings here include correlation between diabetes knowledge and SDSCA, correlation between health provider communication and SDSCA, correlation between patient understanding of diabetes management and SDSCA, correlation between patient involvement in decision making and SDSCA, and correlation between social support and SDSCA.

4.5.1. Correlation between Diabetes knowledge and SDSCA

The correlation between diabetes knowledge and SDSCA was determined. Pairwise correlation showed that, there was no statistical relationship between diabetes knowledge and SDSCA (Diet plan, Exercise plan, Blood sugar testing, Foot care, Medication and Total SDSCA) among diabetic patients [r (198) = 0.1, -0.01, 0.01, 0.06, -0.05 and 0.07 respectively with $p > 0.05$]. Table 4.2 shows the results of the association between diabetes knowledge and SDSCA.

Table 4.2: Correlation between Diabetes knowledge and SDSCA

Variable	Mean	SD	Diabetes knowledge (r)
Diabetes knowledge	12.83	2.48	1
Diet plan	18.89	7.74	0.10
Exercise plan	4.53	5.04	-0.01
Blood sugar testing	6.74	5.77	0.01
Foot care	3.12	4.55	0.06
Medication	6.19	2.03	-0.05
Total SDSCA	39.47	14.9	0.07

Source: Field Data (2019).

4.5.3. Correlation between health provider communication and SDSCA

The association between health provider communication and SDSCA was measured. Correlation analysis showed that, there was a statistically significant relationship between provider communication and SDSCA, and blood sugar testing and total SDSCA [r (198) = 0.24, $p < 0.001$ and 0.15, $p < 0.05$] respectively. However, there is no statistical relationship between diabetes provider communication and SDSCA variables: diet plan, exercise plan, foot care and medication among diabetic patients. Table 4.3 portrays the results of the Association between health provider communication and SDSCA.

Table 4.3: Correlation between health provider communication and SDSCA

Variable	Mean	SD	Provider communication (r)
Provider communication	15.93	5.28	1
Diet plan	18.89	7.74	0.05
Exercise plan	4.53	5.04	0.12
Blood sugar testing	6.74	5.77	0.24***
Foot care	3.12	4.55	-0.11
Medication	6.19	2.03	0.13
Total SDSCA	39.47	14.9	0.15*

*=p-value<0.05; ***=p-value<0.001. **Source: Field Data (2019)**.

4.5.4. Correlation between how well health care providers helped patients' understanding of diabetes management and SDSCA (diabetes self-management practices)

The correlation between how well health care providers helped patients' understanding of diabetes self-management and SDSCA was established. Correlation analysis showed that, there was a statistically significant relationship between how well health care providers helped patients' understanding of diabetes self-management and SDSCA variables: diet plan, blood sugar testing, medication and total SDSCA [r (198) = 0.26, 0.39, 0.42 and 0.35, with $p < 0.001$] respectively. However, there was no statistical relationship between how well health care providers helped patients' understanding of diabetes self-management and exercise plan and foot

care. Table 4.4 displays the results of the correlation between how well health care providers helped patients' understanding of diabetes management and SDSCA.

Table 4.4: Correlation between patient understanding of diabetes management and SDSCA

Variable	Mean	SD	Patients' understanding of diabetes self-management (r)
Patients' understanding of diabetes self-management	25.1	7.59	1
Diet plan	18.89	7.74	0.26***
Exercise plan	4.53	5.04	0.02
Blood sugar testing	6.74	5.77	0.39***
Foot care	3.12	4.55	-0.004
Medication	6.19	2.03	0.42***
Total SDSCA	39.47	14.9	0.35***

***=p-value<0.001. Source: Field Data (2019).

4.5.5. Correlation between patients' involvement in decision making and SDSCA

The correlation between patients' involvement in health provider decision making and SDSCA was analysed. The results showed that, patients' involvement in health provider decision making was significantly correlated with SDSCA diet plan [r (198) = 16, p <0.05] where exercise plan, blood sugar testing, foot care, medication and total SDSCA were not directly correlated with patients' involvement in health providers decision making [r (198) = 0.02, 0.03, -0.04, 0.03 and 0.09, p > 0.05] respectively. Table 4.5 demonstrates the results of the correlation between patients' involvement in health provider decision making and SDSCA.

Table 4.5: Correlation between patient involvement in decision making and SDSCA

Variable	Mean	SD	Provider decision making(r)
Provider decision making	5.42	2.89	1
Diet plan	18.89	7.74	0.16*
Exercise plan	4.53	5.04	0.02
Blood sugar testing	6.74	5.77	0.03
Foot care	3.12	4.55	0.04
Medication	6.19	2.03	0.03
Total SDSCA	39.47	14.9	0.09

*=p-value<0.05. Source: Field Data (2019).

4.5.6. Correlation between family and friends social support and SDSCA

Correlation between social family and friends support relationship with SDSCA was measured. The results showed that, social support was statistically significant correlated with SDSCA variables blood sugar testing and total SDSCA [r (198) = 0.15, $p < 0.05$] respectively. Table 4.6 shows the results of the association between family and friends social support and SDSCA.

Table 4.6: correlation between family and friends social support and SDSCA

Variable	Mean	SD	Social support (r)
Social support	37.71	12.4	1
Diet plan	18.89	7.74	0.12
Exercise plan	4.53	5.04	0.01
Blood sugar testing	6.74	5.77	0.15*
Foot care	3.12	4.55	0.06
Medication	6.19	2.03	0.06
Total SDSCA	39.47	14.9	0.15*

*=p-value<0.05. Source: Field Data (2019).

4.10. Linear regression on factors associated with diabetes self- management practices

Under univariate analysis, sex, how well health care providers helped patients understanding of diabetes self-management and social (family and friends) support were found to be statistically significantly associated with diabetes self-management practices. However, under the multivariate analysis, being a female was statistically significant with an increased SDSCA (β=4.64; 95%CI= 0.65-8.62); and high satisfaction with how well health care providers helped patients understanding of diabetes self-management was also significant with an increase in participant's SDSCA (β=3.47; 95%CI= 1.46-8.22). Other variables were not significantly associated with SDSCA. Tables 4.7a and 4.7b present the results.

Table 4.7a: Linear regression on factors associated with diabetes self-practices

Predictor	c β [95%CI]p-value	a β [95%CI]p-value
Sex		
Male	**Ref**	**Ref**
Female	4.62[0.35-8.88]0.034	4.64[0.65-8.62]0.023
Age group		
<=49	**Ref**	
50-59	3.77[-3.14-10.6]0.283	
60-69	1.20[-5.31-7.70]0.717	
70+	4.02[-3.07-11.13]0.265	
Marital status		
Married	**Ref**	
Single	-0.67[-8-7.13]0.886	
Widowed	1.26[-3.51-6.04]0.602	
Divorced	3.11[-4.11-10.33]0.396	
Level of Education		
Tertiary education	**Ref**	
No formal education	-4.24[-10.9-2.48]0.215	
Elementary	-3.89[10.14-2.35]0.220	
JHS	-4.84[-11.74-2.1]0.168	
SHS/secondary	-5.01[-12.2-2.23]0.174	

Table 4.7b: Linear regression on factors associated with diabetes self-practices

Predictor	Univariate (β [95%CI]p-v)	Multivariate β [95%CI]p-value
Occupation group		
Skilled	**Ref**	
Unskillled	-1.16[-7.89-5.57]0.734	
Uneployed	-0.35[-6.77-6.06]0.913	
Level of Income		
≥Gh¢2000.00+	**Ref**	
≤Gh¢199.00	-1.85[-9.3-5.6]0.627	
Gh¢200.00-Gh¢499.00	-5.50[-13.4-2.4]0.173	
Gh¢500.00-Gh¢c999.00	-6.33[-15.4-2.7]0.168	
Gh¢1000.00-Gh¢1999.00	-2.66[-12.4-7.0]0.589	
Diabetes knowledge		
Poor	**Ref**	
Average	2.33[-2.79-7.44]0.371	
Good	1.67[-4.38-7.72]0.587	
Provider communication		
Poor	**Ref**	
Moderate	1.26[-3.89-6.4]0.631	
Satisfied	4.09[-1.69-9.88]0.164	
Diabetes Self-care management		
Poor	**Ref**	**Ref**
Moderate	8.45[2.95-13.9]0.003	1.83[0.84-4.00]0.129
Satisfied	13.22[7.10-19.3]0.000	3.47[1.46-8.22]0.005
Provider decision making		
Low	**Ref**	
Moderate	0.81[-3.61-5.22]0.719	
High	5.08[-2.72-12.89]0.200	
Family and friends support		
Low	**Ref**	**Ref**
Moderate	0.02[-5.67-5.72]0.992	-1.99[-7.4-3.41]0.468
High	7.97[2.52-13.4]0.004	4.61[-0.50-9.74]0.077

4.11. Summary of chapter

This chapter has presented results of the study as analysed from the returned questionnaires. The chapter has revealed that while some of the variables significantly associated with diabetes self-management practices, others were not significant. The next chapter presents the discussion of the findings and their relationship with current literature.

CHAPTER FIVE
DISCUSSION OF FINDINGS

5.0. Introduction

This chapter discusses the results obtained from analysis of the quantitative data and their relationship with current literature. The chapter is divided into sections. Section one presents level of diabetes self-management/ care practices. Section two presents patients' socio-demographic and diabetes self-care practices. Section three presents diabetes knowledge and diabetes self-care practices. Section four presents health provider factors and diabetes self-care practices. Section five presents social support and diabetes self-care practices. Section six presents the chapter summary.

5.1. Level of Diabetes Self-Management (Self-Care) Practices

The study revealed that the proportion of the diabetes patients with good self-care practices was low (25.2%). This finding was consistent with another study that was conducted among patients with diabetes in North-West Ethiopia, which showed that the level of good or high self-care practice was also low (28.4%) (Abate, Tareke, & Tirfie, 2018). This was further confirmed by another study in Iran, which showed that the proportion of self-care practices was very low (15.1%) (Yekta *et al*., 2011). However, the level of self-management practices from this study and North West Ethiopia were relatively higher than the one from Iran. This may be due to the fact that both Ghana where this current study was conducted and Ethiopia are African countries - they may have the same socioeconomic characteristics as well as similar settings compared with Iran, which is in Asia.

Looking at the individual domains, it was ascertained that most of the respondents (82.8%) highly adhered to their recommended medication. This result was consistent with another study

conducted among diabetes patients in three hospitals in Upper West Region of Ghana, which found that most of the participants (94%) took their recommended medications (Kpekura, 2017). This may be attributed to the fact that most of the participants in this study (75.3%) were supporting the idea of medication being more important than diet and exercise to control diabetes (see appendix C). Hence, their willingness to adhere to their medication. However, this contradicts the low (38.5%) adherence to medication among diabetes patients who attended the Korle Bu Teaching Hospital (Bruce, Acheampong, & Kretchy, 2015).

With regards to self-monitoring of blood glucose, the study found that only 32.8% of the participants tested their blood sugar as recommended. The low prevalence of self-monitoring of blood glucose as compared with the high prevalence of medication adherence may be due to the fact that, diabetes medicines are free on the National Health Insurance Scheme (NHIS). This makes it affordable and available to patients, hence, their compliance. However, the glucometer and glucometer strips, which are used for the blood glucose monitoring are not free on the NHIS and are not cheap either. This implies that patients would have to buy them out of pocket if they were to check their blood sugar.

Thus, patients who could not afford to buy because of lack of funds would not check their blood sugar, hence, the low prevalence of blood glucose self-monitoring. This finding is congruent with findings from a study among diabetes patients who attended the Jos University Teaching Hospital (JUTH) and a private specialist clinic in Jos, North Central Nigeria, which revealed that, less than 50% of the participants were self-monitoring their blood glucose as recommended (Edah *et al*., 2016).

However, these findings were incongruent with the documented high prevalence of appropriate blood sugar testing (78.8%) among diabetic patients in South India (Selvaraj, Ramaswamy, Radhakrishnan, Thekkur, & Chinnakali, 2016). The differences in prevalence may be due to the fact that Ghana and Nigeria are from the same continent of Africa and as such may have similar socio-economic characteristics compared with India, which is in Asia.

The study also revealed that the participants' adherence to recommended dietary plan (27.8%) and exercise regimen (25.8%) as well as foot care (25.8%) were low compared with their adherence to medication. These low values may be as a result of the fact that adherence to these regimens needs life style modification and would require great efforts for one to alter their routine habits as against just taking medication. These findings were consistent with a previous study, which also documented low prevalence of adherence to recommended exercise and dietary plans (Selvaraj *et al*., 2016). Furthermore, it confirms findings from a study that adherence to diet, blood glucose self-monitoring and foot care was relatively low among diabetes patients in Ghana (Mogre, Abanga, Tzelepis, Johnson, & Paul, 2017).

5.2. Patients' socio-demographic factors and diabetes self-management (self-care) practices

This section presents the findings on the relationship between the socio-demographic factors of the respondents and diabetes self-management based on literature.

5.2.1. Age and diabetes self-management (self-care) practices

It has been reported that the age of people living with diabetes can predict their self-care practices (Abrahim, 2011). Abrahim (2011) assessed factors, which influence diabetes self-care practices, and showed that, age correlated with diabetes self-care practices. Another study also agreed with the stated finding that younger diabetes patients were less likely to participate in

self-care activities (Kugbey, Asante, & Adulai, 2017). Contrary to the above findings, this study showed that, there was no association between self-care practices and age even though those aged 50-59 years had higher SDSCA (32.3%). This finding agreed with a study in three hospitals in the Upper West Region of Ghana, which indicated no significant association between self-care practices and age (Kpekura, 2017).

5.2.2. Sex and diabetes self-care practices

Findings of the association between patient factors (socio-demographic characteristics) and overall level of SDSCA showed that only sex was statistically significant. Being a female was associated with an increased SDSCA of 4.64 (β=4.64; 95%CI= 0.65-8.62). The study agreed with other studies, which found significant association between sex and diabetes self-care practices (Yu *et al*., 2013). Yu *et al*. (2013) showed that women were more likely to adhere to healthy diets, checking of their blood sugar and examining their foot. This was consistent with the findings from this study, which predicted that women were more likely than men to engage in self-care activities.

These findings may be explained by the fact that in a typical Ghanaian culture, men are seen as strong and so would not seek help when sick and consequently, would not engage in self-care activities as against women who are seen as vulnerable and would seek help concerning their health. This is also the health seeking behaviour often seen in men and women (Janz & Becker, 1984). This notion could also be supported by findings from this study, which indicated that out of the 198 patients who took part in the study, 149 were females, affirming that females were more likely than men to seek help concerning their health and ultimately self-care practices. However, the results from this study were incongruent with other studies, which showed no statistically significant association between sex and self-care practices (Kpekura, 2017).

5.2.3. Level of education and diabetes self-care practices

Even though this study found that the prevalence of high SDSCA was among elementary school leavers (26.7%), there was no association between level of education and diabetes self-care practices. This was inconsistent with findings from previous studies, which documented that educational level was significantly associated with diabetes self-management practices (Adulai, 2017). Adulai (2017) found that the higher the patients educational level, the more likely they were to participate in diabetes self-care practices. This was buttressed by another study, which found a significant association between educational level and diabetes self-care practices (Yekta *et al*., 2011). The difference between these findings may be due to the fact that even though participants might have different educational backgrounds, there was no difference in their knowledge pertaining to diabetes and its self-care activities, and hence, participants saw no need to engage in them.

5.2.4. Marital status and diabetes self- care practices

Literature argues that there is a correlation between marital status and self-care practices (Gopichandran *et al*., 2012). Gopichandran *et al*. (2012) mentioned that patients who were married had good exercise behaviours as well as self-monitoring of their blood sugar. However, these findings were contradicted by this study, which showed no significant association between marital status and self-care practices even though higher SDSCA (32.3%) was seen among those who were divorced (35.0%).

5.2.5. Income level and diabetes self-care practices

Results from this study showed that, those with low socioeconomic or income below GHS200 had high SDSCA (30.7%). However, there was no association between diabetes patients' income and self-care practices. This is consistent with a study, which showed no significant association

between income level and self-care practices (Kpekura, 2017). It is however, inconsistent with findings from other studies (Shrivastava *et al*., 2013). Shrivastava *et al*. (2013) stated that, most patients with non-adherence were in the low socioeconomic status. The difference in the findings may be due to increasing westernization such that, foods, which were previously not common and mostly affordable for the rich like fried potato chips, burgers are now readily available and cheaper so anyone can afford it irrespective of their income or socio-economic status. Again, due to westernization, people from either the high or low socio-economic status or income level prefer to watch TV instead of the usual outdoor games like soccer, among others (which is a form of exercise).

5.2.6. Occupation and Diabetes self-care practices

This study found that unskilled workers had higher SDSCA (28.7%). However, there was no significant association between occupational status and self-care practices. This is inconsistent with studies, which found that there was an association between occupation and diabetes self-care practices (Pyatak, 2011).

5.3. Diabetes knowledge and diabetes self-management practices

This section presents the findings related to knowledge of diabetes and literature. Previous studies have shown that a person's knowledge of diabetes self-care practices could enhance adherence (Smalls *et al*., 2012). A study found an association between patients' knowledge of diabetes and blood glucose self-monitoring, exercise and medication adherence and care of their feet (Smalls *et al*., 2012). Similarly, another study from Ghana found that patients who had diabetes knowledge were more likely to participate in self-care practices (Kugbey *et al*., 2017).

However, there have been instances where patients' knowledge of diabetes did not translate into practice of self-management activities (Desalu *et al*., 2011). This was confirmed in this study such that when the association between diabetes knowledge and SDSCA was determined using the Pairwise correlation, there was no statistical relationship found between diabetes knowledge and SDSCA (Diet plan, Exercise plan, Blood sugar testing, Foot care, Medication and Total SDSCA) among diabetic patients [r (198) = 0.1, -0.01, 0.01, 0.06, -0.05 and 0.07 respectively with $p > 0.05$].

This corresponds with a study, which reported that diabetes knowledge was not directly associated with diabetes self-care practices (Bains *et al*., 2011). The findings from this study support the point that, knowledge of a condition in itself may not be enough to drive a person to manage their diabetes and even when some patients decide to stick to their recommended diabetes self-care regimen, they may not necessarily know or understand the advantages of engaging in such self-management plan (Nam *et al*., 2011).

5.4. Health care providers and diabetes self-care practices

This section presents the findings related to the health provider factors with headings such as health providers' communication, patients understanding of diabetes self-care management, and patient involvement in decision making style and diabetes self-care practices. Chan *et al*. (2009) posit that in developing countries, factors pertinent to patients, doctors, and health care systems all impact on glycemic control or diabetes.

5.4.1. Provider communication and diabetes self-care practices

Some studies have suggested that individuals, especially healthcare providers providing the diabetes care should consider local and individual contexts and strive to make their approach

patient-centered and engage the active participation of patients (Habte *et al*., 2016). Findings of the overall satisfaction with healthcare providers' communication in relation to diabetes treatment showed that a minimal of 31.3% was fully satisfied while 52.5% was moderately satisfied with health providers' communication. Meanwhile, there was a significant difference in the prevalence rate in the level of health providers' communication.

Some studies have shown an association between provider communication and diabetes self-care practices (Heisler *et al*., 2002). Heisler *et al*. (2002) found a significant association between provider communication and diabetes self-management practices. Other studies have also confirmed association between provider communication and diabetes self-management practices (Bundesmann & Kaplowitz, 2011). Bundesmann and Kaplowitz (2011) found that effective provider communication about diabetes and its self-management increased the odds of performing diabetes self-care activities. Nam *et al*. (2011) support this by stating that effective patient-provider communication significantly predicts better patients practice of self-care activities. This study's findings showed no statistically significant association between provider communication and diabetes self-management practices and hence, inconsistent with findings from the above studies.

However, correlation analysis showed that, there was a statistically significant relationship between provider communication and SDSCA, and blood sugar testing and total SDSCA [r (198) = 0.24, $p<0.001$ and 0.15, $p < 0.05$] respectively. However, there was no significant relationship between diabetes provider communication and these SDSCA variables: diet plan, exercise plan, foot care and medication among diabetic patients. This suggests that, effective provision of information to patients on diabetes self-management may improve patients' diabetes self-management practices and management outcomes, and indicates why a study argues that there

was the need for better training of health providers in different areas, including health communications and diabetes self-management (Habte *et al*., 2016).

5.4.2. Patients' involvement in participatory decision making style (PDM style) and diabetes self-management practices

Some researchers argue that in most cases, patients are not involved in the decisions concerning their care (see Couët *et al*., 2015). The findings revealed that patient involvement in decision making was high among only 7.6% of the patients. It revealed that there were moderate (21.7%) and low (70.7%) levels of patient involvement in decision making about their health care plans. There was a significant difference in the prevalence rate in the level of patient involvement in decision making.

Nevertheless, the findings showed that, patients' involvement in health provider decision making was not significantly associated with diabetes self-management practices. This finding is inconsistent with another study, which showed an association between PDM style and diabetes self-management practices (Heisler *et al*., 2002). This difference between the findings of these two studies could be attributed to the fact that, even though the tool used in collecting data was the same in both studies, this tool had never been used in Ghana, hence, the difference in settings from both countries could account for the differences in the findings.

5.3.3. Patients' understanding of diabetes self-management of diabetes and diabetes self-management practices

The understanding is that diabetes self-management education (DSME) is the ongoing process of facilitating the knowledge, skill, and ability necessary for diabetes self-care (Funnell *et al*., 2009). The study found that diabetes patients' satisfaction with healthcare providers' involvement in helping them understand diabetes self-management was low (27.8%) as 48.5%

was moderately satisfied. There was a significant difference in the prevalence rate in the level of self-care management.

However, correlation analysis showed that, there was a statistically significant correlation between how well health care providers helped patients' understanding of diabetes self-management and these SDSCA variables: diet plan, blood sugar testing, medication and total SDSCA [r (198) = 0.26, 0.39, 0.42 and 0.35, with $p < 0.001$] respectively. Using multiple linear regression analysis showed that having a high satisfaction with how well healthcare providers helped patients understanding of diabetes self-management significantly predicted an increase in participants' SDSCA (β=3.47; 95%CI= 1.46-8.22). This agrees with a study, which found that patients' understanding of diabetes self-management was a significant predictor of diabetes self-management in all its domains (Heisler *et al*., 2002). These findings imply that in order for patients to adhere to their recommended medical regimen, they must understand what they are supposed to do, and even more appreciative if they are helped by their healthcare professionals whom they have entrusted their health with.

5.5. Community factors (social support) and diabetes self-management practices

This section presents the findings of the assessment of community factors using the family and friends social support and their relationship with existing literature. The findings indicated that overall diabetic patients' family and friends support was that only 43.4% of the participants had high social support with 34.9% having moderate social support. However, the difference in high and moderate support was not statistically significant. This finding may suggest the need to consider the admonition that emotional barriers to adequate treatment are often more important than financial concerns, even among low-income patients (Lipton *et al*., 1998).

The univariate analysis from this study showed that there was a significant association between social support and diabetes self-management. Similarly, Affusim and Francis (2018) found a significant association between social support and medication adherence, clinic attendance, and BMI among diabetes patients. However, multiple linear regression showed that social support was not significantly associated with diabetes self-management practices. These findings are inconsistent with studies from other parts of the world - a study in western Ethiopia found that patients with no social support had greater odds of having poor self-care practices than those with social support (Chali, Salih, & Abate, 2018).

Even though this study showed no significant association between social support and diabetes self-management practices from multiple linear regression, the correlation analysis revealed that social support statistically correlated with SDSCA variables; blood sugar testing and total SDSCA [r (198) = 0.15, $p < 0.05$] respectively. These findings are supported by another study, which found that social support positively correlated with diabetes self-care practices in Iran (Karimy, Koohestani, & Araban, 2018). These findings may be so because the diabetes patients live in a community with family and friends and so are prone to eat or behave like their friends and family. For instance, if the family and friends are eating fatty foods, the patient is more likely to also eat those foods as compared with a patient in a family that has decided to eat foods that are recommended to the patient so as to motivate him/her to also eat same.

In addition, if the family and friends whom they trust encourage them to exercise, constantly check their sugar, among other things, they would be motivated to do it. For instance, in a typical Ghanaian community where there is strong belief in the extended family system, any encouragement from the family would likely motivate the patient whereas any discouragement would also discourage them since the opinion of family members are easily accepted.

Additionally, some family and friends provide monetary support towards the patients' health care. For example, family and friends may pay for hospital expenses, buy glucometers, among other things, for the patients. Therefore, if the patients are encouraged and supported by these people to adhere to the self-care activities, they are more likely to comply. Despite the numerous benefits of social support, it appears to be limited in supporting diabetes patients in their diabetes self-management practices, especially in Ghana (see de-Graft Aikins *et al*., 2015).

5.6. Summary of chapter

This chapter has presented the findings of the study and their association with current literature. The chapter also argued that multiple linear regression estimated sex and how well healthcare providers helped patients understanding of diabetes self-care management as statistically significant predictors of highest SDSCA (self-management practices). Thus, the chapter has revealed that while some of the variables significantly associated with diabetes self-management practices at the univariate and multiple linear regression analyses, others were not significant. Again correlation analysis showed that some variables positively correlated with diabetes self-management practices. The next chapter presents the summary, conclusion and recommendations of the study.

CHAPTER SIX
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.0. Introduction

This final chapter presents the summary of key findings from the study. The chapter is divided into sections. Section one presents the summary of the findings. Section two presents the conclusions of the study. Section three presents contribution to policy and practice as well as research methodology. Section four presents the recommendations. Section five presents the limitation. Section six presents directions for future research.

6.1. Summary of the study

This section presents the summary based on the general objective of the study. This study examined factors associated with diabetes self-management among patients with diabetes attending the Greater Accra Regional Hospital. A quantitative research method was applied to collect data for subsequent analysis and presentation. Generally, the study concludes that the level of high/good diabetes self-management practices among the diabetes patients who presented at the GARH was low. Additionally, the study concludes that except for medication adherence, which was high, level of practice of all other domains were low, which implies that efforts made to increase self-care practices should target the other domains such as self-monitoring of blood glucose, foot care, among others. These conclusion were consistent with some previous studies, which identified low prevalence of adherence to recommended exercise and dietary plans among diabetes patients (Selvaraj *et al*., 2016).

6.3. Conclusions of the study

This section presents the conclusions based on the specific objectives of the study. That is, the study examined the level of diabetes self-management practices among the diabetes patients at the GARH and the association between socio-demographic factors, health provider factors, community factors (social support), as well as diabetes knowledge and diabetes self-management practices. The key findings relating to these specific objectives have been presented below.

6.3.1. Patients' socio-demographic factors and diabetes self-management (self-care) practices

The study concludes that there was a significant association between sex of respondents and diabetes self-care practices. However, there was no significant association between age, occupation, educational level, and marital status of the respondents and diabetes self-management practices. The conclusion was that, the fact that there was a significant association between sex and diabetes self-management practices means that in ensuring increase in the diabetes self-care practices, sex should be taken into consideration as it influences self-care practices. This conclusion agreed with similar conclusions in other studies, where a significant association was established between sex and diabetes self-care practices (Yu et al., 2013).

6.3.2. Diabetes knowledge and diabetes self-management practices

The study concludes that there was no significant association between diabetes knowledge and diabetes self-management practices. This conclusion sits with the conclusion of a study, which found that diabetes knowledge was not directly associated with diabetes self-care practices (Bains et al., 2011).

6.3.3. Health care providers and diabetes self-care practices

The study further concludes that there was a significant association between patients' satisfaction with how well healthcare professionals helped them to understand diabetes self-management and diabetes self-management practices with no significant association between patient involvement in decision making and health provider communication using multiple linear regression. However, there was also a significant correlation between provider communication and Diabetes self-care practices using pairwise correlation. Similar studies have made relevant conclusions in this direction (see Heisler *et al*., 2002).

6.3.4. Community factors (social support) and diabetes self-management practices

Another conclusion of the study was that there is no significant association between social support and diabetes self-management practices under multivariate analysis even though there was significant association in the univariate analysis. The findings demonstrated that 43.4% of the diabetes patients' had high family and friends support and 34.9% for experiencing moderate social support. Social support statistically correlated with SDSCA variables such as; blood sugar testing and total SDSCA (diabetes self-management practices). A similar conclusion was documented by some researchers.

6.4. Contribution to knowledge

The study makes some contribution to knowledge in the fields of policy and practice and methodology as presented in this section.

6.4.1. Contribution to policy and practice

One of the study's key contributions could be related to policy and practice in the health sector of Ghana. It could be argued that although policy makers in the health sector of Ghana have

provided some policy directions regarding the management of diabetes in healthcare institutions, there was yet to be the adoption of diabetes self-management (self-care) as a key policy.

Since the study concluded that there were correlations between diabetes self-management (self-care) and these crucial indicators; how well health care providers helped patient understanding of diabetes self-management as well as social support, implies that interventions instituted to increase self-care practices should seek to strengthen patient-provider communication, as well as existing social support for patients with diabetes.

The above policy recommendation is made based on the conclusion of the study that although blood glucose self-monitoring was low, adherence to medication was high. This could be explained by the realness that even as diabetes medicines are available on the National Health Insurance Scheme (NHIS) essential medicines policy, glucometers and glucometer strips for monitoring the blood glucose was not available on the list. This means that diabetes patients would have to procure them on their own or depend on relatives and friends for financial support in acquiring them. This may put some financial strain on patients who might not be working or on pension and do not have any strong family support. The need to consider the inclusion of such items on the NHIS for free could be looked into by health policy makers in Ghana and other countries with similar interventions and challenges. Some analysts support the need for the provision of affordable pharmaceutical drugs, standardised ethnomedical drugs, recommended foods, and psychosocial support (de-Graft Aikins, 2005).

Additionally, the study recommends to policy makers in the healthcare environment to consider the socio-cultural background of the country when formulating or reformulating policies for diabetes management. The finding that social support statistically correlated with some of the

SDSCA variables such as; blood sugar testing and total SDSCA should be used as stepping stone to consider the need to strengthen social support so as to increase diabetes self-care practices. A similar idea has been mooted earlier that in an effort to address some of the hindrances to the successful practices of diabetes self-management, health systems should seek to rectify structural deficiencies that impinge on biomedical practices, regulating ethnomedical diabetes treatment, and foregrounding faith healer practices within diabetes policy discussions (de-Graft Aikins, 2005).

6.4. Recommendation

On the basis of the findings and conclusions of this study, the following have been recommended for consideration by policy makers and practitioners in the health sector as well as diabetes patients and their families.

Policy makers and Health Practitioners

These are recommended for consideration by policy makers and practitioners in the health sector:

Ministry of Health should consider the inclusion of glucometer and glucometer strips in the NHIS essential medicines policy to make them easily accessible to diabetes patients so that there would be improvement in their self-monitoring of blood glucose and diabetes treatment outcome on the whole.

Ministry of Health could also liaise with healthcare providers to organise intermittent workshops for healthcare professionals on effective ways of ensuring provider-patient communication in order to encourage effective communication, which would improve patients understanding of diabetes self-management as well as its practices and ultimately treatment outcome.

Ministry of Health in collaboration with healthcare providers to include diabetes self-management education programmes in health services rendered at health facilities with a diabetic clinic. This would help to improve patients' understanding of diabetes self-management. Patients' understanding has been revealed to improve diabetes self-management practices.

Diabetes Patients

These are recommended for consideration by diabetes patients and their families:

It is recommended that just like the directly observed therapy (DOT) policy for tuberculosis management, diabetes patients should be encouraged to bring along a family member or a friend whom they trust to the diabetic clinic from time to time. This person to be described as a Diabetes Treatment Supporter (DTS) would help to ensure that the patients sticks to their self-care practices, which include taking their medication, eating recommended food, checking their feet. This is because as family and friends support has been shown to correlate with diabetes self-management practices.

It is recommended that the Ministry of Health in collaboration with healthcare providers should set up and fund diabetes social support groups/clubs at the various diabetes clinics or in communities, where diabetes patients could meet and share their experiences as well as encourage each other in participating in diabetes self-management practices. These support groups could organise health walks as well as education on diabetes and its management among its members from time to time.

6.5. Limitations

Few challenges were encountered in making this study a reality. There was difficulty in translating some of technical terms in the adapted questionnaire into the local dialects of respondents.

Additionally, the research used only quantitative methods (without exploratory qualitative methods) to collect data. Hence, patients' own perception of why some results were obtained could not be ascertained. Moreover, the research did not show the effects of diabetes self-management practices on glycemic control as well economic cost of the diabetes self-management.

Moreover, another shortcoming of the study related to the use of only one diabetes clinic in only one health facility in one municipality and only one region out of the sixteen regions of Ghana, meant that the study could not capture the divergent views of diabetes patients from across the length and breadth of the country. Although findings of quantitative studies could be generalised, caution should be taken in generalising to populations outside of the GARH.

Despite these deficiencies, the adoption and application of validated tools meant that validity and reliability were assured (see Toobert & Glasgow, 1994; Fitzgerald *et al*., 1996; Michigan Diabetes Research and Training Center, 1998; Heisler *et al*., 2002). Thus, the findings conformed to validity and reliability guidelines needed in the conduct of quantitative studies.

6.6. Future Research

It is anticipated that some of the limitations enumerated above could be addressed if the following suggestions are considered in future research endeavour in this or related fields. It would be recalled that this research applied only quantitative methods without exploratory

qualitative methods to collect data. Therefore, future research should use both the quantitative and qualitative research approaches when conducting a similar research so that results obtained would not only be quantified but respondents would be given the chance to bring their own perceptions to bear on some of the results obtained.

In addition, future studies should attempt to assess the effects of diabetes self-management practices on glycemic control as well as economic cost of diabetes self-management.

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APPENDICES

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APPENDIX A: PARTICIPANTS' CONSENT AND INFORMATION SHEETS

PART I: PARTICIPANTS' INFORMATION SHEET

Research Title: Factors associated with Diabetes Self-management among patients attending the Greater Accra Regional Hospital

Name of Researcher: Nana Akua Asante

Introduction: Nana Akua Asante, is my name. I am a postgraduate student of the University of Ghana (UG) reading Masters in Public Health (MPH). I am carrying out a research on "Factors associated with diabetes self-management" in partial fulfillment for the award of my MPH degree and will like to invite you to participate though you do not need to decide immediately to participate. I will explain the details of this consent form to you so you understand what the study entails.

Background: One of the key communicable diseases killing a lot of people, especially in Ghana is diabetes. Diabetes self-management practices have been shown to bring about a reduction in the complications of the disease, however, several factors have been shown to affect these self-management. This research seeks to find out what factors affect the self-management among diabetes patients attending the Greater Accra Regional Hospital.

Purpose and Nature of the Study: It has been identified that some people on diabetes treatment are not experiencing improvement as expected while some are doing so well. Diabetes self-

management has been proven to improve glycemic control. This study seeks to ascertain the factors associated with diabetes self-management among diabetes patients attending the Greater Accra Regional (Ridge) Hospital of Ghana. The study will require that you answer some questions (by completing a questionnaire) pertaining to diabetes and your self-care practices. The information you will provide will help to ensure better treatment outcomes and enhance blood sugar control among people with diabetes.

Potential Risks and Discomforts: In participating in this study, I will be asking you to share some personal views and experiences concerning diabetes and your self-care practices with me and you may feel uncomfortable talking about some of the topics. You do not have to answer every question or take part in the research if you don't wish to do so.

Voluntary Participation: Participation in this survey is completely voluntary and you are free to withdraw your participation anytime without giving any reason for doing so. I will give you an opportunity at the end of the interview to review your responses, and you can ask to change any responses that you want.

Additional Costs and Compensation: You will not have to spend money in partaking in this study and you will not be compensated for participating. If you agree to participate in the study, you will be asked to fill the questionnaires before or after your medical appointment and in a place at the clinic that is convenient for you. You will only have to spare 20-30 minutes of your time to answer the questions I will ask.

Confidentiality: No information shared with me will be disclosed to any of your community members or to anyone who is not part of the study team. The information that I will collect from this study will be used only for academic purposes.

Contacts for Additional Information: If you have any questions about this research, you can ask them now or later. If you wish to ask questions later, you may contact me, Nana Akua Asante, School of Public Health, College of Health Sciences, University of Ghana, Legon, on the following number 0506405842 or via email: nanaakuaasante6@gmail.com.

You can also contact the Ghana Health Service-Ethical Review Committee Administrator, Madam Hannah Frimpong, on 0507041223 for any clarifications on ethical issues and your right as participants.

PART II: PARTICIPANTS' CONSENT FORM/ CERTIFICATE OF CONSENT

I have been invited to participate in a research on "Factors Associated with Diabetes Self-Management among Diabetes patients attending the Greater Accra Regional Hospital". The document describing the nature and purpose as well as risks and benefits of the study has been read and explained to me. I have been given an opportunity to have any questions about the study answered to my satisfaction. I agree voluntarily to participate in this study.

_____ _____ _____

Full name of participant Signature or Thumb print Date

DECLARATION BY TRANSLATOR (IF THE CONTENT HAD TO BE TRANLATED INTO A LANGUAGE THAT THE PARTICIPANT UNDERSTANDS)

I was present while the benefits, risks and nature and purpose of the study were translated into a language that the participant understands. All questions were answered and the participant has agreed voluntarily to take part in the study.

_____ _____ _____

Full name of translator Signature or Thumb print Date

DECLARATION BY WITNESS (IF PARTICIPANT CANNOT READ BY HIM/HERSELF)

I was present while the benefits, risks and nature and purpose of the study were read to the participant. All questions were answered and the participant has agreed voluntarily to take part in the study.

_____ _____ _____

Full name of witness Signature or Thumb print Date

RESEARCHER'S SIGNATURE COLUMN

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this study have been explained to the above individual to the best of my ability. I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the consent has been given freely and voluntarily.

_____	_____	_____
Name of researcher	Signature	Date

……..	…….....
Date	Signature / Right Thumbprint

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APPENDIX B: Questionnaire on factors associated with diabetes self-management among diabetes patients attending the Greater Accra Regional Hospital

Introduction

The purpose of this survey is to assess factors associated with diabetes self-management among diabetes patients in Ghana. To this end, this questionnaire is intended to ascertain your knowledge and willingness to practice diabetes self-management as a way of managing your condition. The Greater Accra Regional (Ridge) Hospital has been chosen for this study. Your co-operation in this exercise will determine the success of the study. The information would benefit you in the long run, as it would help policy makers to pay more attention to diabetes management or care in the health facilities. The outcome is meant exclusively for academic work and confidentiality is guaranteed. You have the right to withdraw from this interview at any stage you wish, but it would be appreciated if you fully complete it. The interview will take about 10-15 minutes of your time. Thank you.

Section A: Socio-Demographic Characteristics

0.1. Date: / /

0.2. Interviewer:

1.1. Participant ID:

3.1. Age:

4.1. Sex: [1] Male [2] Female

5.1.Place of Residence:

6.1 What is your Level of education?	1. No formal education 2. Elementary 3. JHS 4. SHS/Secondary 5. Tertiary education
7.1. What is your occupation group?	1. Managers

	2. Professionals/skilled 3. Clerical support workers 4. Service and Sales. 5. Skilled Agricultural workers 6. Crafts & Related Trade 7. Elementary Occ/Labourer 8. Unemployed
8.1. What is your estimated monthly level of income?	1. Gh¢199.00 or less 2. Gh¢200.00 - Gh¢499.00 3. Gh¢500.00 - Gh¢999.00 4. Gh¢1,000.00 - Gh¢1,999.00 5. Gh¢2,000.00 - Gh¢3,999.00 6. Gh¢4,000.00 & Above
9.1. What is your marital status?	1. Single 2. Married 3. Widowed 4. Divorced

Section B: Knowledge of diabetes self-management

Next I'm going to ask you questions on your knowledge of diabetes. Tick 'yes' for correct answer and 'no' for incorrect answer. If you do not have any idea about it, please tick 'I don't know'. Take your time and think about the questions before answering.

	Statement	Yes	No	Don't Know
1	Eating too much sugar and other sweet foods is a cause of diabetes			
2	The usual cause of diabetes is lack of effective insulin in the body.			
3	Diabetes is caused by failure of the kidneys to keep sugar out of the urine			
4	Kidneys produce insulin.			

5	In untreated diabetes, the amount of sugar in the blood usually increases.			
6	If I am diabetic, my children have a higher chance of being diabetic.			
7	Diabetes can be cured			
8	A fasting blood level of 210 is too high.			
9	The best way to check my diabetes is by testing my urine.			
10	Regular exercise will increase the need for insulin or other diabetic medication.			
11	There are two main types of diabetes: type 1 (insulin-dependent) and type 2 (non-insulin dependent).			
12	An insulin reaction is caused by too much food.			
13	Medication is more important than diet and exercise to control diabetes.			
14	Diabetes often causes poor circulation.			
15	Cuts and abrasions on diabetics heal more slowly.			
16	Diabetics should take extra care when cutting their toenails.			
17	A person with diabetes should cleanse a cut with iodine and alcohol.			
18	The way I prepare my food is as important as the foods I eat.			
19	Diabetes can damage my kidneys			
20	Shaking and sweating are signs of high blood sugar			
21	Frequent urination and thirst are signs of low blood sugar.			
22	Frequent urination and thirst are signs of low blood sugar.			
23	Tight elastic hose or socks are not bad for diabetics.			
24	A diabetic diet consists mostly of special foods.			

Section C: The Summary of Diabetes Self- Care Activities (SDSCA)

The questions below ask you about your diabetes self-care activities during the past 7 days. (If you were sick during the past 7 days, please think back to the last 7 days that you were not sick).

Number of days	**Response**
1. How many of the last SEVEN DAYS have you followed a healthful eating plan?	0 1 2 3 4 5 6 7
2. On average, over the past month, how many DAYS PER WEEK have you followed your eating plan?	0 1 2 3 4 5 6 7
3. On how many of the last SEVEN DAYS did you eat five or more servings of fruits and vegetables?	0 1 2 3 4 5 6 7
4. On how many of the last SEVEN DAYS did you eat high fat foods such as red meat or full-fat dairy products?	0 1 2 3 4 5 6 7
Exercise	
5. On how many of the last SEVEN DAYS did you participate in at least 30 minutes of physical activity?	0 1 2 3 4 5 6 7
6. On how many of the last SEVEN DAYS did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or as part of your work?	0 1 2 3 4 5 6 7
Blood Sugar Testing	
7. On how many of the last SEVEN DAYS did you test your blood sugar?	0 1 2 3 4 5 6 7
8. On how many of the last SEVEN DAYS did you test your blood sugar the number of times recommended by your health care provider?	0 1 2 3 4 5 6 7
Foot Care	
9. On how many of the last SEVEN DAYS did you check your feet?	0 1 2 3 4 5 6 7
10. On how many of the SEVEN DAYS did you inspect the inside of your shoes?	0 1 2 3 4 5 6 7
Medications	

11. On how many of the last SEVEN DAYS, did you take your recommended diabetes medication? OR On how many of the last SEVEN DAYS did you take your recommended insulin injections?	0 1 2 3 4 5 6 7

Section D: Health Provider factors

Provider communication / counselling (PCOM)

How well were you satisfied with your health care professional in terms of the following? (Please tick one answer for the questions below).

	Statement	Poor	Fair	Good	Very Good	Excellent
1	Telling you everything you need to know					
2	Letting you know your test results when promised					
3	Explain the treatment alternatives					
4	Explaining the side effects of your medication					
5	Telling you what to expect from your disease and treatment					

Patients' understanding of diabetes self-management

How well do health providers help you to understand the following?

(Please tick one answer for the questions below).

	Statement	Poor	Fair	Good	Very Good	Excellent
1	How to care for your feet					
2	How to take your medications					
3	What to do to symptoms of low blood sugar					

4	How to make your food choices					
5	How and when to test your blood sugar					
6	Diabetes complication					
7	How to exercises					

Patients' involvement in decision making (provider decision making style)

How often does your health care professional who takes care of your diabetes do the following?

(Please tick one answer for the questions below).

	Statement	**None of the time**	**Rarely**	**Some of the time**	**Most of the time**	**All of the time**
1	Offer you choices in your medical care					
2	Discuss pros and cons of each choice with you					
3	Allow you to state the choice or option you prefer					
4	Take your preference into account when making decisions					

Section D: Social Support of Family and Friends

To what extent do your family or friends help and support you in the following:

(Please tick one answer for each line)

	Statement	**Strongly Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Strongly Agree**	**Does Not Apply**
A	Follow my meal plan						
B	Take my medicine						
C	Take care of my feet						

D	Get enough physical activity						
E	Test my sugar						
F	Handle my feelings about diabetes						
G	Accept me and my diabetes						
H	Feel uncomfortable about me because of my diabetes						
I	Encourage or reassure me about my diabetes						
J	Discourage or upset me about my diabetes						
K	Listen to me when I want to talk about my diabetes						
L	Nag me about diabetes						

APPENDIX C: Descriptive statistics of diabetes knowledge assessment among diabetes patients

C.1. Descriptive statistics of diabetes knowledge assessment among diabetes patients

Individual knowledge assessment was measured using 23 standard questions. The results showed that, almost all, 187 (94.4%) knew that eating too much sugar and other sweet food causes diabetes. Surprisingly, only 117 (59.1%) knew that their children have a higher chance of being diabetic with about 149 (75.3%) supporting the idea of medication being more important than diet and exercise to control diabetes. Whilst 177 (89.4%) knew that diabetic patient should take extra care when cutting their toenails, only 103 (52.0%) knew that diabetes can damage their kidneys. Tables 4.2a and 4.2b present results of the descriptive statistics of diabetes knowledge assessment among diabetes patients.

Table C.1a: Descriptive statistics of diabetes knowledge assessment among diabetes patients

Statement	Yes	No	Don't know	Total
Eating too much sugar and other sweet food causes diabetes	187(94.4)	9(4.6)	2 (1.0)	198
Lack of effective insulin	125(63.1)	49(24.8)	24(12.1)	198
Failure of kidney to keep sugar out of the urine	148(78.4)	28(14.1)	22(11.1)	198
Kidneys produce insulin	127(64.1)	42(21.2)	29(14.7)	198
In untreated diabetes, the amount of sugar in the blood usually increases	175(88.4)	16(8.1)	7(3.5)	198
If am diabetes, my children have a higher chance of being diabetic	117(59.1)	70(35.4)	11(5.6)	198
Diabetes can be cured	140(70.7)	49(24.8)	9(4.6)	198
A fasting blood level of 210 is high	93(47.0)	91(46.0)	14(7.1)	198
The best way to check diabetes is by testing my urine	61(30.8)	131(66.2)	6(3.0)	198
Regular exercise will increase the need for insulin	109(55.1)	48(24.2)	41(20.7)	198
There are main types of diabetes (type 1 and 2)	115(58.1)	72(36.4)	11(5.6)	198
An insulin reaction is caused by too much food	138(69.7)	35(17.7)	25(12.6)	198

Medication is more important than diet and exercise to control diabetes	149(75.3)	46(23.2)	3(1.5)	198

Table C.1b: Descriptive statistics of diabetes knowledge assessment among diabetes patients

Statement	Yes	No	Don't know	Total
Diabetes often caused poor circulation	144(72.7)	52(26.3)	2(1.0)	198
Cuts and abrasions on diabetics heal more slowly	139(70.2)	46(23.2)	13(6.6)	198
Diabetics should take extra care when cutting their toenails	177(89.4)	19(9.6)	2(1.0)	198
A person with diabetes should cleans a cut with iodine and alcohol	142(71.7)	14(7.1)	42(21.2)	198
The way I prepare my food is as important as the foods I eat	134(67.7)	52(26.3)	12(6.1)	198
Diabetes can damage my kidneys	103(52.0)	92(46.5)	3(1.5)	198
Shaking and sweating are signs of high blood sugar	105(53.0)	84(42.4)	9(4.6)	198
Frequent urination and thirst are signs of low blood sugar	101(51.0)	87(43.9)	10(5.1)	198
Tight elastic hose or socks are not bad for diabetes	100(50.5)	97(49.0)	1(0.5)	198
A diabetic diet consist mostly of special foods	140(70.7)	45(22.2)	13(6.6)	198

Appendix D: Descriptive statistics of Health providers' communication assessment among diabetes patients

D.1. Health providers' communication assessment among diabetes patients

Results of healthcare providers' communications showed that, 75 (38.3%) had excellent satisfaction with their health care provider telling telling them everything they need to know. Diabetes patients 61 (31.6%) had excellent satisfaction when it comes to their health care providers letting them know their test results. Meanwhile, in terms of explaining treatment alternatives and side effect of the medication, only about 27 (14.2%) and 28 (14.4%) had excellent satisfaction respectively. Table 4.3 outlines results of health providers' communication assessment among diabetes patients.

Table D.2: Health providers' communication assessment among diabetes patients

Provider communication	**Level of satisfaction**					**Total**
	Poor	**Fair**	**Good**	**Very good**	**Excellent**	
How well satisfied with healthcare professional in …	n (%)	n (%)	n (%)	n (%)	n (%)	
Telling you everything you need to know	6 (3.1)	24(12.2)	32(16.3)	59(30.1)	75(38.3)	196
Letting you know your test results when promised	20(10.4)	22(11.4)	28(14.5)	62 (32.1)	61(31.6)	193
Explain the treatment alternatives	45(23.7)	36 (19.0)	31(16.3)	51(26.8)	27(14.2)	190
Explaining of side effect of the medication	61(31.3)	26(13.3)	37(19.0)	43(22.1)	28(14.4)	195
Telling you what to expect fprom your disease and treatment	43(22.3)	27(14.0)	29(15.0)	47(24.4)	47(24.4)	193

Source: Field Data (2019).

Appendix E: Descriptive statistics of Understanding of diabetes self-care management assessment among diabetes patients

E.1. Understanding of diabetes self-care management assessment among diabetes patients

Results of the diabetes patients' understanding of diabetes self-care management indicated that, about 36 (18.5%) indicated that their health care providers helped them to excellently understand how to care for feet and more than half, 103 (52.6) had excellent help with their health care providers in knowing how to take their medication. Symptoms of low blood sugar were excellently understood among 83 (43.0%) whereas 86 (44.6%) understood how to make their food choices. The results further showed that, diabetes patients' need for help by healthcare providers to understand how and when to test blood sugar and diabetes complication were excellent among 76 (39.2%) and 66 (34.7%) respectively and 48 (24.6%) understood how to exercise. Table 4.4 indicates results of understanding of diabetes self-care management assessment among diabetes patients.

Table E.1 Understanding of diabetes self-care management assessment among diabetes patients

	Level of satisfaction					**Total**
	Poor	**Fair**	**Good**	**Very good**	**Excellent**	
How well do health providers help to understand…	n (%)	n (%)	n (%)	n (%)	n (%)	
How to care for your feet	60(30.8)	17(8.7)	19(9.7)	63(32.3)	36(18.5)	195
How to take your medications	8(4.1)	4(2.0)	28(14.3)	53(27.0)	103(52.6)	196
What to do to symptoms of low blood sugar	20(10.4)	14(7.3)	26(13.5)	50(25.9)	83(43.0)	193
How to make your food choices	12(6.2)	15(7.8)	29(15.0)	51(26.4)	86(44.6)	193
How and when to test your blood sugar	22(11.3)	21(10.8)	32(16.5)	43(22.2)	76(39.2)	194
Diabetes complication	18(9.5)	20(10.5)	39(20.5)	47(24.7)	66(34.7)	190
How to exercises	32(16.4)	20(10.3)	41(21.0)	54(27.7)	48(24.6)	195

Source: Field Data (2019).

Appendix F: Descriptive statistics of Patient involvement in decision making assessment among diabetes patients

F.1.Patient involvement in decision making assessment among diabetes patients

A question was asked to establish patients' involvement in decision making in their healthcare. The results revealed that, About 3 (1.5%) diabetic patients were offered choices in their medical care all the time with only 2 (1%) were offered healthcare in the pros and cons of each choice all the time, 2 (1%) showed that health providers allowed them to state their choice or option they prefer all the time, and 2 (1%) said that their health providers took their preference into account when making decisions all the time. Table 4.5 depicts results of patient involvement in decision making assessment among diabetes patients

Table F.1: Patient involvement in decision making assessment among diabetes patients

Statement	**Level**					**Total**
	None	**Rarely**	**Sometime**	**Most time**	**All time**	
How often does your health care…	n(%)	n(%)	n(%)	n (%)	n (%)	
Offer you choices in your medical care	152(77.)	23(11.7)	14(7.1)	5(2.5)	3(1.5)	197
Discuss pros and cons of each choice with you	151(76.)	21(10.7)	14(7.1)	9(4.6)	2(1.0)	197
Allow you to state the choice or option you prefer	154(78.)	33(16.8)	6(3.1)	2(1.0)	2(1.0)	197
Take your preference into account when making decisions	152(77.2)	31(15.7)	10(5.1)	2(1.0)	2(1.0)	197

Appendix G: Descriptive statistics of Family and friends social support assessment among diabetes patients

G.1 Family and friends social support assessment among diabetes patients

The results of the aassessment of family and friends support indicated that more than half 121 (62.7) of the diabetic patient strongly agreed that family and friends support in follow meal plan, 127 (65.8) for take medicine, 107 (57.8%) for test my sugar, 130 (69.2%) for handle feelings about diabetes, 145 (76.7%) for accept them and their diabetes, 141 (73.4%) for encourage or reassure them about my diabetes, and 128 (67.0%) for listen to them when they want to talk about my diabetes. Table 4.6A 4.6B demonstrates the results of family and friends social support assessment among diabetes patients.

Table G.1A Family and friends social support assessment among diabetes patients

Statement	Extent of support						
	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree	Does not apply	Total
Family and friends support you in ...	n(%)	n (%)	n (%)	n (%)	n (%)	n (%)	
Follow my meal plan	19(9.8)	9(4.7)	18(9.3)	20(10.4)	121(62.7)	6(3.1)	193
Take my medicine	12(6.2)	6(3.1)	15(7.8)	18(9.3)	127(65.8)	15(7.8)	193
Take care of my feet	44 (22.9)	12 (6.3)	35(18.2)	14(7.3)	54 (28.1)	33(17.2)	192
Get enough physical activity	16(8.3)	17(8.9)	35(18.2)	22(11.5)	85(44.3)	17(8.9)	192
Test my sugar	12(6.5)	4(2.2)	23(12.4)	15(8.1)	107(57.8)	24(13.0)	185
Handle my feelings about diabetes	5(2.7)	4(2.1)	17(9.0)	22(11.7)	130(69.2)	10(5.3)	188

Table G.1B: Family and friends social support assessment among diabetes patients

Statement	Extent of support						
	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree	Does not apply	Total
Accept me and my diabetes	3(1.6)	3(1.6)	13(6.9)	16(8.5)	145(76.7)	9(4.8)	189
Feel uncomfortable about me because of my diabetes	117(62.2)	8(4.3)	14(7.5)	7(3.7)	23(12.2)	19(10.1)	188
Encourage or reassure me about my diabetes	9(4.7)	5(2.6)	12(6.3)	15(7.8)	141(73.4)	10(5.2)	192
Discourage or upset me about my diabetes	126(66.3)	10(5.3)	13(6.8)	4(2.1)	11(5.8)	26(13.7)	190
Listen to me when i want to talk about my diabetes	12(6.3)	8(4.2)	22(11.5)	11(5.8)	128(67.0)	10(5.2)	191
Nag me about diabetes	127(66.2)	13(6.8)	18(9.4)	-	9(4.7)	25(13.0)	192

Appendix H: Descriptive statistics of level of diabetes self-care practices among diabetic patients

H.1. Summary statistics: Level of diabetes self-care practices among diabetic patients

The results showed that, more than half, 110 (57.6%) indicated that they followed health eating plan in the past seven days with 102 (53.1%) noting that they followed their eating plan. Amazingly, about 108 (54.8%) noted that they did not eat high fat or full fat diary food within the past seven days. Nevertheless, exercise plan showed that, 35 (17.7%) and 32 (16.2%) respectively participated in 30 minutes physical activity and specific exercise like Biking for the past seven days. Moreover, 68 (34.5%) and 74 (37.6%) tested blood sugar by themselves and based on prescriber recommendation respectively in the past seven days. Meanwhile, foot care assessment showed that, in the past seven days, only 37 (18.8%) checked their feet while 24 (12.2%) checked their shoes before wearing them. Surprisingly, majority 164 (82.8%) informed that they took their recommended medication in the past seven days. Table 4.7 indicates results of the summary statistics of the level of diabetes self-care activities (SDSCA) among diabetes patients.

Table H.1: Summary statistics: Level of diabetes Self-care activities (SDSCA) among diabetes patients

Summary of diabetes self-care activities	Number of days								Total
	None	One	Two	Three	Four	Five	Six	Seven	
In the past seven days...									
Diet plan									
How many days followed health eating plan in the past seven days	46(21.4)	3(1.6)	2(1.1)	9(4.7)	4(2.1)	10(5.2)	7(3.7)	110(57.6)	191
On average how many days per week have you follow your eating plan	46(24.0)	3(1.6)	5(2.6)	10(5.2)	8(4.2)	9(4.7)	9(4.7)	102(53.1)	192
How many days eating five or more servings of fruits	18(9.1)	18(9.1)	26(13.1)	22(11.1)	22(11.1)	14(7.1)	7(3.5)	71(35.9)	198
How many days of eating high fat or full fat dairy food	108(54.8)	29(14.7)	19(9.6)	12(6.1)	6(3.1)	7(3.6)	3(1.5)	13(6.6)	197
Exercise plan									
How many days participated in 30 min physical activity	79(39.9)	21(10.6)	19(9.6)	25(12.6)	10(5.1)	7(3.5)	2(1.0)	35(17.7)	198
How many days participated in specific exercise eg Biking	93(47.0)	16(8.1)	20(10.1)	17(8.6)	8(4.0)	4(2.0)	8(4.0)	32(16.2)	198
Blood sugar testing									
How many days tested blood sugar	55(27.9)	22(11.2)	19(9.6)	20(10.2)	8(4.1)	3(1.5)	2(1.0)	68(34.5)	197
How many days tested blood sugar based of prescriber recommendation	51(25.9)	24(12.2)	23(11.7)	17(8.6)	2(1.0)	3(1.5)	3(1.5)	74(37.6)	197
Foot care									
How many days feet checks done	116(58.9)	15(7.6)	8(4.1)	7(3.6)	6(3.1)	6(3.1)	2(1.0)	37(18.8)	197
How many number of days inside shoes checks done	146(74.1)	8(4.1)	7(3.6)	5(2.5)	2(1.0)	3(1.5)	2(1.0)	24(12.2)	197
Medication									
How many times recommended diabetic medication taken	13(6.6)	5(2.5)	2(1.0)	2(1.0)	2(1.0)	5(2.5)	5(2.5)	164(82.8)	1987

Table I: Interrater-item reliability measure of SDSCA scale

Item	Obs	Sign	correlation	correlation	Covariance	alpha
How many days followed health eating plan in the past seven days	191	+	0.7	0.5	1.1	0.7
On average how many days per week have you follow your eating plan	192	+	0.7	0.5	1.1	0.7
How many days eating five or more servings of fruits	198	+	0.5	0.3	1.3	0.7
How many days of eatong high fat or full fat dairy food	197	+	0.3	0.2	1.5	0.7
How many days participated in 30min physical activity	198	+	0.6	0.4	1.2	0.7
How many days participated in specific exercise eg Biking	198	+	0.5	0.3	1.4	0.7
How many days tested blood sugar	197	+	0.6	0.4	1.2	0.7
How many days tested blood sugar based of prescriber recommendation	197	+	0.6	0.4	1.2	0.7
How many days feet checks done	197	+	0.4	0.2	1.4	0.7
How many number of days inside shoes checks done	197	+	0.3	0.1	1.5	0.7
How many times recommended diabetic medication taken	198	+	0.5	0.4	1.3	0.7
Test scale					1.3	0.7

The table shows that, an acceptable 70% of the scale have shared covariance (α=0.7). Meaning that, the scale is a reliable measure which probably approach in measure the same underlying concept SDSCA.

APPENDIX I: Ethical Clearance Approval

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

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

MyRef. GHS/RDD/ERC/Admin/App
Your Ref. No. 19/095

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20th March, 2019

Nana Akua Asante
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Public Health School of

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	GHS-ERC008/12/18
Project Title	Factors Associated with Diabetes Self-Management among Diabetes Patients attending Greater Accra Regional Hospital
Approval Date	20th March, 2019
Expiry Date	19th March, 2020
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report after completion of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.
- Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
DR. CYNTHIA BANNERMAN
(GHS-ERC CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra