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SCHOOL OF PUBLIC HEALTH

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CONTINUITY OF CARE AMONG DIABETES PATIENTS AND THEIR HEALTH PROVIDERS IN GREATER ACCRA REGION

BY

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DECLARATION

I, Veronica Awumee, declare that this research work, "Continuity of Care among Diabetes Patients and their Health Providers in Greater Accra" is my own and original work under supervision of Dr.Samuel.K.K.Dery. This report has never been submitted either in whole or part for award of any degree in any other institution but for the references to other researchers work which have duly been acknowledged.

………………………………………..

Veronica Awumee (Student)

Date: 18/10/2019

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Dr. Samuel K. Dery (Supervisor)

Date: 18/10/2019

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DEDICATION

This dissertation is dedicated to my lovely parents Torgbui Xornametor I and Mrs Florence Kaledzi and Rev.Dr and Mrs Awumee. I could not have asked for better parents. I owe you a great deal of gratitude. I love you so much. Remain forever blessed.

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The Lord is my strength and my song. He is my provider and my rock. I am highly indebted to God most high for his grace and providence that has brought me this far. He is the reason for this season! I wish to acknowledge and express my deepest gratitude to Rev Dr.and Mrs. Awumee and Mr.Vincent and Mrs. Florence Kaledzi for making this dream a reality. Mr Steve and Mrs Olivia Dotse thanks so much for your support. I am forever grateful to you. I wish to express my appreciation to Dr. Samuel K Dery for bringing out the best in me and his priceless effort to make this happen. Mr Collins D. Dalton ,God bless you exceedingly for your massive support

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ABSTRACT

Introduction

Diabetes Mellitus is no more a condition of the affluence but a fast-rising non-contagious disease of global importance which still remains a leading cause of indisposition and death. Currently about half a billion people are suffering from this condition globally. Research has it that 8 out of 10 adults are living with Diabetes in sub-Saharan countries. Ghana over the years has a prevalence rate of diabetes patients to be 9% making it quite disturbing.

Although there has been an existing care among diabetics and their health providers, there is the need to know the extent of continuity of care between diabetics and their health providers.

Objective: The aim of this study is to determine the extent of continuity (Relational, Longitudinal, Flexible and Team) and satisfaction of care between diabetic patients and their care providers.

Methodology

This study was facility-based cross-sectional study which was conducted among diabetics in in Greater Accra Region. Data was collected via the use of a pre-tested structured questionnaire. Information on socio-demographic characteristics and four dimensions of continuity of care and patients' satisfaction was obtained using ODK software and exported to Stata 15 for analysis. Means and standard deviations were determined for continuous variables. Pearson chi-square test was used to determine the association between dependent and independent variables. Multiple logistic regression was used to determine the strength of association of factors associated with relational continuity of care. Reported p-values < 0.05.

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Results

The highest extent of continuity of care was team continuity (mean=0.9) followed by relational and flexibility continuity of care (mean=0.8). Longitudinal continuity of care was the least experienced by patients (mean=0.5). Most patients (98.3%) were satisfied with diabetes care they received from health care providers. Factors associated with high relational continuity of care: high flexible continuity of care and low longitudinal continuity

Conclusion

Experience of continuity of care among diabetics is high excluding longitudinal continuity of care. High relational continuity of care translated into high satisfaction of diabetes care received from health care providers. Good adherence to medication and high team continuity of care positively influenced attainment of high relational continuity of care. Further research is needed in order to understand the extent of longitudinal continuity and its effect on relational continuity

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ABBREVIATIONS AND ACRONYMS

BDI-Buddy Doctor Initiative

BoP-Base of the Pyramid

COC- Continuity of Care

DM-Diabetes Mellitus

ESRD- End stage renal disease

FCOC-Flexible Continuity of Care

LCOC-Longitudinal Continuity of Care

RCOC-Relational Continuity of Care

TCOC-Team Continuity of Care

WHO-World Health Organization

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Operational Definitions

Insulin: It is a hormone produced in the pancreas which is responsible for transporting glucose from the blood cells to the cells in the body.

Diabetes Mellitus: It is a chronic disease that sets in when there are high levels of glucose in the blood due to ineffective use of the hormone insulin because the body cannot produce any or enough of the insulin or both.

Type 1 Diabetes mellitus: This happens when no or little insulin is produced as result of damaging insulin producing cells of the pancreas. This leads to concentration of glucose in the blood cells.

Type 2 Diabetes Mellitus: This sets in when insulin produced is not processed effectively leading to high blood glucose.

Continuity of Care: Consistent existence quality of health care overtime

Relational Continuity of Care: A strong continuum interpersonal Doctor-Patient relationship

Flexible Continuity of care: Care that can easily be modified to respond to emerging needs of the patient

Team Continuity of Care: Care that is well coordinated

Longitudinal Continuity of Care: Repeated care overtime with same health provider overtime.

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CHAPTER ONE

INTRODUCTION

1.1 Background

It has been reported that, the management of Diabetes Mellitus(DM) averts or delays its development into other difficulties and subsequent reduction in hospital admissions (Chang, Chien, Lin, Chiou, & Chiu, 2015; Perkovic et al., 2013).Like other chronic diseases, diabetes requires complex management as it is a lifelong disease. Management of diabetes mellitus necessitates close collaboration among diabetics, health practitioners and other members of the diabetes care team. The multifaceted management of the disease is strongly related to continuity of care (Chang, Chien, Bai, Lin, & Chiou, 2018). This concept of health care service is thought to exist when it is rendered in a harmonizing manner within a desirable period.

Continuity of care (COC) is defined by the American Academy of Family Physicians as "the process by which the patient and his or her physician-led care team are corporately involved in ongoing health care management towards the shared goal of high quality and cost-effective medical care". This type of care is physician-led and team-based. Overall, it lessens fragmentation of care and ensures patients' wellbeing as well as the quality of care (American Academy of Family Physicians, 2018). It also lesson's economic burden on health, improved patient outcomes and higher level of patient satisfaction (Napolitano, Napolitano, Garofalo, Recupito, & Angelillo, 2016). Continuity of care is broadly branded as a vital element for delivering high quality health care particularly among persons who suffer from chronic conditions and multiple comorbidities (Mendes, Laurência, & Gemito, 2015). Individuals who suffer from these lasting conditions require plethora of complex management of these conditions from different health experts in multiple settings making them one of the main users of health care services (Napolitano et al., 2016; Steiner & Friedman, 2013).

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There are several aspects of COC. However, Gulliford and colleagues categorized COC among diabetes mellitus patients into four dimensions. These dimensions include longitudinal continuity (LCOC), Relational continuity(RCOC),Flexible continuity(FCOC) and Team continuity (TCOC) (Gulliford, Naithani, & Morgan, 2006).

Longitudinal continuity of care implies the measure of repeated visit either to same physician or same facility over time. This type of continuity depicts an ongoing doctor-patient interaction that takes place at the same place, with same medical record such that those providing care have an increasing knowledge of the patient (Saultz, 2003). It also implies patients obtain health care from the same professionals in emergent needs. Most patients measure LCOC with the duration of the relationship they have with their health providers. However, this cannot be in isolation of the display of continual commitment by the health providers towards the patients (Stange, Burge, & Haggerty, 2014). Longitudinal continuity of care among diabetic patients as reported by Alazri and colleagues offers advantages such as good preventive measures which include more foot examinations, retinal examinations, blood glucose monitoring and an overall better diabetic control (Alazri, Heywood, Neal, & Leese, 2007a).

Relational continuity of care (RCOC) is gradually gaining relevance amidst the current era of increasingly depersonalized and fragmented health care systems. A desired therapeutic physician-Patient relationship is reported to have a positive association with patients' satisfaction of care, adherence to medication and desired treatment response. Other societal benefits are reduced admission cases and lower treatment cost (Noyes et al.,2016). This therapeutic relational alliance can result to quality of care as it has close links with patient satisfaction of care as well continuity of care (Noyes et al., 2016). In other words a strong physician-Patient relationship may lead to other forms of continuity of care (Noyes et al., 2016). Patients who suffer from chronic diseases such as diabetes are prone to increased risk

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of receiving fragmented health care as they are seen by different health care professionals in different settings (Stange et al., 2014). This exposes them to reduced quality of care and possible health threats most especially in cases where care received is less coordinated (Waibel, Vargas, Coderch, & Vázquez, 2018). The concept of RCOC stems from the fact that it is a therapeutic relationship between a patient and one or more health practitioners. This relationship extends to several health care events resulting in the accumulation of information about the patient and of reliable care with the needs of the patient (Burge et al., 2011). Due to the complex nature of management of chronic diseases such as diabetes, health care providers need to ensure that services rendered to patients are tailored to meet the changing needs of these patients. This can be achieved via flexibility of continuity (Gulliford, Naithani, & Morgan, 2006a). This type of continuity for patients provides services that are flexible and are tailored to meet their needs. This is expedient in health care for changing needs of patients. It is therefore essential that healthcare experts render services that best fit the needs of the patient (Alazri et al., 2007a). To add to this, the Team concept of COC is grounded on the premise that patients battling chronic diseases obtain health care from a team of health care experts who work in either primary or secondary settings. These team of health professionals are responsible for the overall healthcare services offered to their clients. This aspect of COC comes into perspective to explain patient perceptions and experiences of the care they receive from a group of health professionals. (Alazri et al., 2007a)

Studies conducted on the effects of continuity of care among patients with chronic diseases corroborate the benefits of continuity of care as outlined by the American Academy of Family Physicians(2018) Napolitano et al.(2016) and Waibel et al.(2018). A study done in South Korea on the effects of COC on hospital admissions in patients with type 2 diabetes reported that patients with low scores of COC were more likely to be hospitalized (Cho et al., 2015). Furthermore, another study on RCOC in Spain reported that, patients who experienced regular

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and frequents visits with the same specialist valued having established a mutual relationship typified by personal trust and mutual accumulation of knowledge on their health problems (Waibel et al., 2018).

Diabetes is a major non-communicable disease in Ghana which contributes significantly to illness, disability and deaths in the country. A report presented by the Ghana Health Service shows that the prevalence of adult diabetes in Ghana is about 9% with worsening risk factors for developing the disease (Ghana Health Service, 2017).There has not been any known documentation on the COC among diabetic patients in the country. It is against this context that this study sought to know the extent of continuity and satisfaction of care between diabetic patients and their care providers in Greater Accra Region of Ghana

1.2 Problem statement

Diabetes mellitus is one of the major non-communicable diseases in the world. It is estimated that close to half a billion people live with diabetes across the globe with Sub-Saharan countries bearing almost 80% of this burden (International Diabetes Federation, 2017). Furthermore, there has been a steady increase in the global prevalence in 1980 from 4.7% to 8.5% in adult populations as at 2015. This is nearly twice the prevalence recorded more than 30 decades ago (WHO, 2016). Significant proportion of the global burden of the disease is centered in Africa, Asia and Latin America (Quaicoe et al., 2017). The nature of diabetes cases in Ghana is disturbing since most of the mortality cases are attributed to this condition with a reported adult prevalence of 9% (Ghana Health Service, 2017). This lifelong condition of these patients requires the following health care attributes: frequent visits to their usual care provider, a responsive care in the face of changing needs of the patient, a strong physician-patient interpersonal bond and a well-coordinated care between team of health providers. For patient to adhere and cooperate with treatment, a strong interpersonal relationship must exist between health care providers and patients. Increasing patients-clinicians interaction results in better

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treatment outcomes of these patients(Georgopoulou, 2018). Thus, it takes continuity of care to create this bond and achieve these outcomes (Burge et al., 2011; Napolitano et al., 2016; Waibel et al., 2018). It has been reported by Napolitano and colleagues that, continuity of care is critical to primary health care most especially for people with chronic conditions (Napolitano et al., 2016). This agrees with a study conducted by Gulliford and colleagues that to achieve optimal treatment objectives for diabetes, there must be an existing bond between diabetic patients and their care givers for the entire treatment process (Gulliford et al., 2006). However, no work has been done in Ghana to measure if there is any existing COC among diabetes mellitus patients and the extent of developing a relationship with care givers. This study therefore provides the need for research to find out the extent of COC and satisfaction of care among diabetes patients and their health care providers.

1.3 Justification

Diabetes Mellitus causes significant impact on morbidity, disability and mortality. It is a lifelong disease. More so, controlling of blood sugar among persons living with diabetes is important for the reduction of mortality and morbidity. The management of diabetes poses great challenge to both the patient and health care providers. The chronic state of the disease requires continuous and comprehensive health care from health care providers. There is empirical evidence that adequate management of chronic diseases can be achieved via the concept of COC (Burge et al., 2011; Chang et al., 2018; Cho et al., 2015; Napolitano et al., 2016). Continuity of care has been reported to increase health outcomes among diabetes patients and improve overall satisfaction with health care delivery (Alazri et al., 2007a; Burge et al., 2011; K. H. Cho et al., 2015).

Hence, this study sought to determine the extent of COC and satisfaction of care between diabetic patients and their care providers in Greater Accra Region. Furthermore, this study will bring to the fore the extent of patients' experience of COC with respect to LCOC, RCOC,

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FCOC and TCOC. Additionally, this study will serve as a basis for advocacy of COC among diabetic patients in the country. This study will also help policy makers to formulate effective policies on continuity of health care in Ghana and also help to prioritize interventions that will enhance COC among diabetic patients and their care givers in the country.

1.4 Objectives

1.4.1 Main objective of the study

The aim of this study is to determine the extent of continuity and satisfaction of care between diabetic patients and their care providers in Greater Accra Region.

1.4.2 Specific objectives of the study

1. To determine the extent of patients' experience of continuity of care (longitudinal continuity, relational continuity, flexible continuity and team continuity).
2. To examine the effect of relational continuity of care on patient satisfaction with care received.
3. To determine the factors contributing to relational continuity of care.

1.5 Research questions

1. To what extent do diabetic patients experience continuity of care?
2. What is the effect of relational continuity of care on patients' satisfaction?
3. What are the factors influencing relational continuity of care?

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1.6 Conceptual Framework

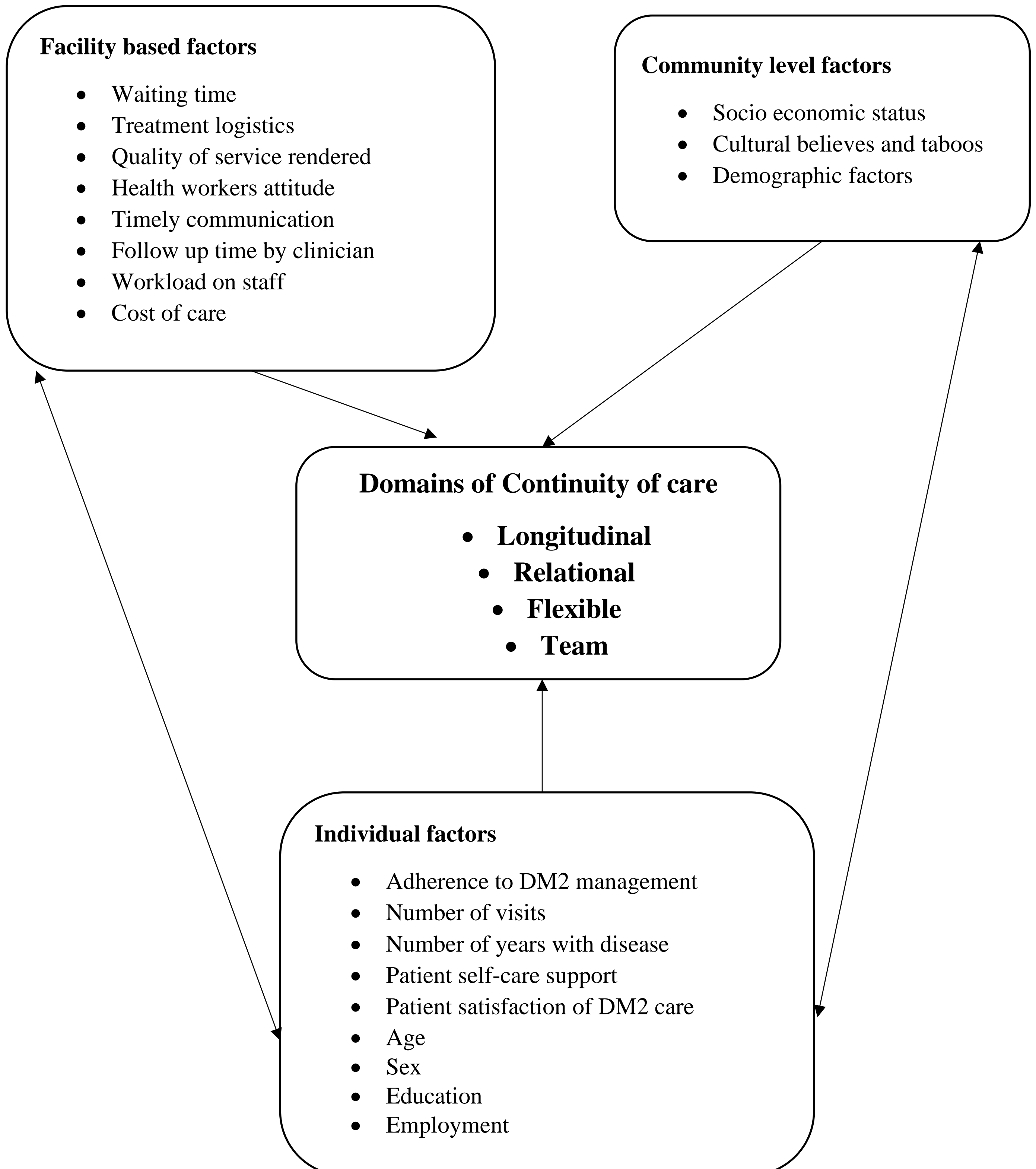

Figure 1: Conceptual framework on patient's continuity of care

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1.6.1 Narrative of Conceptual Framework

The framework depicts factors that influence all the domains of Continuity of care among patients. Figure 1 shows factors influencing continuity of care and how they are categorized into individual factors, facility and health provider factors and Community level Factors.Individual factors relates to the factors centred on the patient that are more likely to influence continuity of care, facility factors such as time spent by health professional on a patient, treatment logistics, the quality of services rendered and the progress made on treatment influence how the patient perceives continuity of care. Community factors include demographic status of the community, cultural believes and taboos. Some cultural belief and taboos affect Physician-Patient relationship which influences extent of continuity. All the afore mentioned factors influence these domains of continuity: longitudinal, relational, flexible and team continuity are all needed to promote and sustain COC. The complex nature of the management of chronic diseases requires care even outside the walls of the health facility. The type of care diabetic patients receive may or may not translate into the concept of COC. People living with diabetes may experience none, one or more of these four dimensions of COC.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Diabetes mellitus, burden and risk factors

Diabetes mellitus (DM) is an ailment of the metabolism system characterized by high blood glucose level and followed by secretion of sugary urine (Schneider, 2008). The primary cause of DM is an absolute or relative deficit of insulin, defect in insulin action or both. Diabetes mellitus is classified into two main types: Type 1 or insulin-dependent DM and type 2 or non-insulin dependent DM. The former, which represents 25% of all diabetes cases is more common among young people but can occur at any age in the life cycle (Schneider, 2008). The latter, which is the focus of this study is the most frequent type of DM representing 60% of all cases and it is usually after the age of forty (Schneider, 2008).

Diabetes mellitus has remained one of the chronic non-communicable disease with complex health problems across the globe which could lead to high levels of indispositions, fatalities and financial burden on health system (Seuring et al., 2015). It is evident from literature that Diabetes is among potentially disabling chronic diseases. Individuals with diabetes are at risk of numerous complexities including retinopathy, renal disease and to some extent, heart disease (Mainous Iii, Koopman, Gill, Baker, & Pearson, 2004). Research conducted in 2017 shows that 425 million persons across the globe are living with this condition and this is projected to have increased by 48% by the year 2045 (Ogurtsova, Rocha, Huang, Linnenkamp, & Guariguata, 2017). WHO estimated the occurrence of diabetes in patients aged 18 years and above to have increased from 108 million to 422 million between 1980 and 2014 (WHO, 2016). Evidence has suggested that global prevalence of DM is 4% however, the number of individuals suffering from DM is anticipated to increase by two folds within the next 20 years from 12 to 24 million (Mbanya et al., 2010 & Hall et al., 2011). Globally, an estimated 5 million

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people aged between 20 and 79 years died from diabetes related conditions in 2015 (IDF, 2015). This is reported to be equal to one person dying every six (6)seconds (IDF, 2015). Eight out of ten people with diabetes live in Sub-Saharan countries (IDF, 2017). Most people with diabetes in developing countries are between 45 to 64 and not elderly (65+) (IDF, 2015). Every 30 second, one limb is amputated globally due to DM (Danquah et al., 2012. Each year, almost 5 million people worldwide are diagnose with foot ulcer DM (Danquah et al., 2012). An estimated cost of amputation of diabetic foot is between thirty thousand dollars and sixty thousand dollars (IDF,2017). Diabetes mellitus and other chronic diseases are high in Africa compared to other countries worldwide (IDF,2017). Current studies show that about 15 million African are suffering from DM and this is projected to have increased by 15% by the year 2045 (Ogurtsova et al., 2017).A study done by WHO demonstrated that, predictable prevalence of diabetes in Africa is less than 2% in less developed areas, 5% to 7% in developed sub-Saharan Africa and between 8% to 13% in more advanced areas in Africa (WHO, 2016).

In Ghana, at least 6% of adults are associated with diabetes and obesity(Danquah et al., 2012).Similarly, a researched done by Ghana Health Service revealed estimated adult prevalence to be 9% (Ghana Health Service, 2017). In addition to these burdens, some DM complexities leads to end stage renal disease (ESRD), lower extremity amputation, cardiovascular disease, retinopathy (Cho et al., 2018). This subsequently increases the rate of admissions at the hospital (Shen et al., 2009; ADA, 2015 & WHO, 2016). Risk factors associated with DM include family history of DM, diseases of the pancreas, viral infections, weight and inactivity (Cho et al., 2018). High blood pressure and high cholesterol levels are also risk factors (Hall, Thomsen, Henriksen, & Lohse, 2011)

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2.2 Continuity of care among diabetes Patients

Research has it that globally,75% of patients value seeing their usual providers where as 63% desire a trusting relationship as well as high experience of relational continuity of care (WHO,2018). More so, high experience of continuity translates to 13% fewer hospital admissions. Similarly, high continuity means 27% fewer complications and emergency cases (WHO,2018). A cohort study on type 2 diabetic patients in London conducted by Gulliford and colleagues suggested that experienced continuity was positively associated with the number of consultations in the past one year but negatively associated with the number of health providers seen (Gulliford et al., 2006a). It was reported by some group of researchers in Italy that, 35% of patients with co-morbidities reported high longitudinal continuity (Napolitano et al., 2016). A study done in the Volta region of extent of continuity of care among pregnant women showed, all pregnant women had high continuity with average extent of repeated visits to provider being 66.5% (Dery, 2017).However much is not found on the extent of continuity of care among diabetics in Africa and Ghana as well.

2.3 Continuity of care and its importance in management of diabetes mellitus

Diabetes mellitus (DM) is among the four most common chronic non-communicable diseases affecting most populations today (Chang et al., 2018). Effective supervision of DM can avert or slow its progression which subsequently decreases rate of admissions at the hospital (Collaboration, 2016). Evidence from studies conducted by team of researchers suggest that proper management of DM can slow the progression of kidney diseases which mostly is reported to be associated with DM (Chan et al., 2015 & Perkovic et al., 2013). It is therefore critical that, proper management and treatment of DM be understood among health workers (Chan et al., 2015 & Perkovic et al., 2013). Management of DM is strongly associated with COC (Chang et al., 2018). Confirmation from a study conducted in Portugal showed that, Continuity of care is not just a concept but a right every patient must enjoy, most especially

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persons with chronic conditions of which diabetes is inclusive (Mendes et al., 2015). Literature has it that people with chronic condition value continuity of care more as compared to quick access to care unless scheduled for a new appointment for a different health challenge (WHO, 2018).

The definition of continuity of care (COC) has changed over time due to some contextual factors (Uijen et al., 2011).It is worth to noting continuity of care is a concept with many attributes that requires multi-disciplinary measures to ascertain it holistically (Reid, Haggerty, & Mckendry, 2002). Nevertheless, Saultz (2000) defined COC as a gradable impression ranging from the basic readiness of information about a patient to a complex interpersonal relationship between physician and patient. In that sense, continuity implies a sense of attachment between patients and their practitioners where the physician assumes unending responsibility for the patient (Lustman et al., 2016). Bodenheimer et al (2018) provides a more succinct definition of COC as patients consulting the same clinician every time they seek care. Continuity of care can also be described as a consistent continual clinician–patient non-stop relationship which allows and enhances shared communication, effective management of diseases, and improving disease upshots particularly in patients with lasting conditions (Lin et al., 2015). In addition, Continuity of care has been identified as an essential section of good primary care, along with other concepts such as coordination of care, patient focused care and integration of care (Uijen et al., 2011).In similar sense, the ability to connect past and present care regarding a particular condition reflects continuity(Reid et al., 2002).The benefits of COC in diabetes management cannot be overemphasized. The concept COC in the management of the disease has been reported to improve diagnosis of the disease, provide sustainable management of the disease and ensure favorable health outcomes. This concept of health care is associated with high quality of care and patient satisfaction (Gulliford et al., 2006). Researchers have shown that increased continuity of changing care can reduce DM,

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cardiovascular deaths, cardiovascular events, and health care use and costs for patients who are newly diagnosed with hypertension and hypercholesterolemia (Shin et al., 2014). Mendes and colleagues also reported that, continuity of care reduces fragmentation of care and hence reducing the occurrence of inadequate follow up as well as confusing treatment rules (Mendes et al., 2015). More so, a team of researchers from UK found that, patients with low continuity of care in general practice were more depressed, had chest pains had problems in relating to their health providers and patronized emergency services more often as well as any open access facility (Wei et al., 2008). In view of this, COC is regarded as an essential attribute of good health care which leads to better health outcomes especially in the context of primary health care (Wei et al., 2008). Hussey et al (2014) revealed that high COC of patients is linked to minor rates of emergency cases, difficultiess, and incident costs. In contrast, it was reported that , patients with low experience of COC in general practice are associated with high use of emergency and accident service, more depressed, experience cardiac chest pains as well as exposed to relationship problems (White.et al., 2016).

It is worthy of note that despite the numerous attributes of COC, the process still suffers some challenges. The growing number of physicians seeing patients on part-time basis serves as a barrier to COC (Panattoni et al., 2015). This increase in part-time practices is eroding both COC and prompt access to care. Continuity and patient access to care certainly declines when physicians work for less hours (Panattoni et al., 2015).In contrast, Bodenheimer et al. (2018) reported that, the fast increasing part time practice is a response to evolving difficulties in the primary care setting. Similar claim was raised in UK which indicate that COC declined some time ago in the country and this decline is attributed to reduction in doctor's working hours and an upsurge in part time work (Aboulghate et al., 2012). Continuity of care is very important to the extent that short period of its experience can affect life and death

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2.4 Dimensions of continuity of care

Several dimensions exist for continuity of care. A commonly used categorization identifies four types of continuity namely Relational or interpersonal, Team, flexible and Longitudinal COC (Gulliford, Naithani, & Morgan, 2006). Different studies suggest that interpersonal COC is highly valued by patients especially by females, older patients and those with chronic disease (Aboulghate et al., 2011). Starfield et al. (2005) expanded on the definition by introducing two dimensions: Longitudinal and relational continuity of care. Longitudinal continuity refers to care over time from a regular source of care while relational continuity refers to how continuous relationship flows between patients and doctors with regard to diagnosis and management of a problem which is conveyed from one visit to the next. Saultz (2003) provided a broad review of COC measures and defined COC using a hierarchical framework grounded on the healthcare provider having sufficient information about the patient (informational continuity), which enables patients having repeated care setting (LCOC) over time and results in a relationship of mutual trust and accountability between the patient and provider (Saultz, 2003). Other forms of continuity are Structural continuity and Process continuity. This entails the site of medical encounter and assumes that patients who receive all routine and non-emergent as well as non-routine care at one site are more likely to be seen by one physician or team of health care workers, and will, at least, have an integrated medical record (Nassif et al., 1982). Process continuity refer to the coordinated delivery of care over a period or throughout an illness episode (Nassif et al., 1982). The scope of this study, however, is limited to longitudinal continuity, relational continuity, flexible continuity, and team continuity. These four dimensions of continuity are essential in obtaining maximum satisfaction of care offered to patients(Gulliford & Morgan, 2006;Mendes et al,2015).

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2.5 Longitudinal continuity of care

Longitudinal continuity (LCOC) refers to the degree of care overtime with usual provider. A report by WHO described LCOC as care followed-up by health professionals (WHO, 2018). Longitudinal continuity of care measures the extent of repeated visits by the patient and describes the ongoing pattern of health care with the same facility, same health professional and with same records such that there is a continuous flow of knowledge about the patient. In view of this, the usual provider and the facility becomes the "medical home" of the patient (Saultz, 2003). Longitudinal continuity of care requires that the patient repeatedly access same physician or by attending regular check-ups where several medical tests was done. This continuing care match up with the notion of longitudinal continuity (NCCSDO, 2006).

Suggestions from some studies show that, LCOC is an intrinsic part of COC which can be measured as a dimension. It is mostly expressed as a unit of time in years. A study done in US family practice revealed that longitudinal continuity is linked with important clinical outcomes including: lower prescription cost, fewer emergency hospitalisation and an inverse association with mortality rate (White et al.2016). Similarly, another study done in US confirmed that patient who visited their usual provider of health care over time had 13% reduced rate of hospital admissions than patients with discontinuity of longitudinal care (Barker, Steventon, & Deeny, 2017). In addition, longitudinal continuity has proven to be one of the low-cost methods of measuring continuity of care (White et al.2016). Furthermore researchers from UK reported that higher experience of longitudinal continuity by patient is related to low mortality rate (White.et al,2016). Higher LCOC ensures patients involvement in the treatment process but does not guarantee Patient-Doctor relationship (White.et al,2016). Although LCOC is most often likened to relational continuity, most people assume that the duration of visits to a physician ensures establishment of interpersonal bond. This assertion does not hold always

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since, there may be an underlying distinguishing factor between the two domains of continuity (White et al., 2016; Sault 2003).

2.6 Relational continuity of care

Relational continuity of care (RCOC) is gaining significant recognition especially in this era of increasing fragmentation of health care condition (Waibel et al., 2018). Research has shown that an existing patient-physician relationship helps to reduce dispersion of healthcare (Stange et al., 2014). This suggests that every patient needs a trusted health expert who will help manage their condition (Waibel et al., 2018). Relational continuity of health care is a type of care where there is an existing interpersonal relationship between the patients and health practitioners generally a doctor or nursen (Waibel et al., 2018). This hints the fact that they are known by this health professional who assumes responsibility for their health care. Consequently, some patients are concerned about the quality of care they receive by relating it to seeing their usual provider (NCCSDO, 2006). Interestingly, RCOC is the most emphasized domain of continuity of care in literature and it is often referred to as provider continuity (Reid et al., 2002). Relational continuity is established when the patient does not only know the name of their Physician but develop personal trust and hence making them entrust their basic care to their usual physician. This level of relationship makes the patient assume responsibility for the health provider to be in charge of their inclusive quality of care (White et al.2016 and Saultz, 2003). Indeed, a strong sense of affiliation between physician and patient and the art of patients concentration of care with a particular physician is known to result to numerous benefits including; accurate and non-confusing treatment plan, higher adherence to medication and reduced hospitalization (Reid et al., 2002). It is the desire of most patients to establish strong interpersonal bond with their physician since it creates a sense of affiliation, friendship and personal trust (Lustman et al.2015;Waibel et al.2018). Relational continuity is a common thread that bridges the gap of the past, present and future care. This is most appreciated in

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primary and mental health care (Haggerty, Reid, Freeman, Starfield, & Adair, 2003).

2.7 Flexible Continuity of Care

Flexible continuity (FCOC) is the type of continuity of care which describes the extent to which patients get suitable assistance and support in the face of changing needs overtime (Mendes et al., 2015). Since changing needs of patients are timeless, it is important that staff respond quickly to patients in the times of emergencies (Mendes et al., 2015). In other words, FCOC is the ability of health providers to provide suitable care to emerging needs of patients . This type of continuity contributes to trust and user satisfaction of health service (Mendes et al., 2015). Furthermore, flexible health service plan is needed in facilities most especially in specialist clinics to cater for patients' varying needs in unplanned circumstances. Although FCOC is not considered in most care services as a notable aspect of continuity, it plays key role in patients' satisfaction of care received. It requires that, health providers adapt to care protocols to suit changing needs of the patient (WHO, 2018). It is expedient for any health care service bound to take place over a period of time to make FCOC intrinsic in health care strategies. This wing of continuity of care prevents discontinuity of care most especially for changes in health status in the various stages of life thus changeover from paediatric care to adult care, transition from a functional status of chronic condition or change in organisational goals of the health system. It is evident from literature that, timely provision of complementary and responsive care to the varying needs of patients create a good atmosphere for high quality of care and patient fulfilment of care received (Reid et al., 2002). In a wider view, flexibility of continuity of health care is care adapted to suit patients' culture, beliefs, behaviour and family influences (WHO, 2018).

2.8 Team continuity of care

Team continuity (TCOC) is another aspect of continuity of care which describes how well the

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overall care of the patient is synchronized by a team of health experts. Team continuity of care is mostly referred in literature as management continuity (WHO, 2018). This is a continuum of care managed by different providers across disciplines (WHO, 2018)

In some occasions, patients are being seen by different team of experts in different facilities making interconnection of service important to them. Team continuity of care is sometimes referred to as cross-boundary continuity (Gulliford & Morgan, 2006). Similarly,TCOC reflects the manner of coordination of care received by patient from different health providers. The present-day health system requires a high-level connectedness among different health practitioners across care boundaries in order to render seamless service (Waibel et al., 2018). Collaboration of shared care among different health experts creates a sense of "collective memory" steered towards "collective treatment" process resulting to positive health outcomes (Waibel et al., 2018). Furthermore, TCOC is not only associated with direct treatment process of patient but at different levels of care. This encompasses care planning of shared recommendation of multiple health providers. The WHO categorized coordination of care into three categories: parallel, sequential and system enablers coordination. Parallel coordination takes into consideration multisectoral collaboration of health experts to ensure continuum of care (WHO, 2018). Additionally, sequential coordination is more related to care plans in different health disciplines (WHO, 2018). This includes flexible and timely referral processes and a single point access to healthcare. System enablers coordination on the other hand has to do with inter and intra-role cooperation and agreement of health experts (WHO, 2018). This spans from team training i.e. educating various health experts on care coordination, utilisation of quality improvement tools and technology for promoting care coordination (WHO, 2018). Maximizing continuum coordination of care at all these levels has dual benefits thus enhances better and quality experience of care by patients as well as increases knowledge and satisfaction of health providers (WHO, 2018).

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2.9 Patients satisfaction in relation to continuity of care

Patient satisfaction of a given care practice is one of the essential indicators for determining quality and sustainability of care and patient's adherence. Assessment of patient satisfaction is very crucial in delivering health service because it helps identify loop holes in health service from the perspective of the patient as well as understand healthcare from the client's point of view (Pini et al., 2014). In addition, to achieve treatment objectives for diabetes mellitus, it is required that there is close cooperation among the patient, the physician, and other members of the diabetes care team during the long course of the diabetic illness (Gulliford et al., 2006).

One of the strategies that has led to an increase in patient's satisfaction of clinical treatment is Continuity of care. Based on existing evidence, interpersonal continuity in primary care is associated with a reduction in hospitalizations, emergency department consultations, a significant reduction in health care costs (Cho et al., 2015). Above all, COC leads to improved patient satisfaction (Baker et al., 2011). Continuity of care was found to improve patients' satisfaction, adherence and self-management of DM (Chang et al., 2018).

To this end, it is widely established how useful and important COC is to the principal health care system as well as in the management of DM (Mendes et al., 2015). It is therefore essential that,COC is practiced in all facilities and in the management of chronic diseases especially DM as evidence rightly indicated how it facilitates patient's satisfaction and adherence to clinical instruction. Due to this, this study measures the extent of patients COC and at the same time, determine the proportion of patients who experienced COC on DM. Finally, it will determine the level of satisfaction of relational COC among diabetics in Accra.

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CHPATER THREEE

METHODS

3.1 Study Design

The study was a facility based cross sectional survey involving diabetic patients visiting diabetes clinics in Greater Accra Region. The study was conducted in April 2019. These clinics were diabetic clinics located in Greater Accra Region.

3.2 Study site description

The study was conducted in three hospitals located in the Greater Accra Region Ghana. The hospitals for this study were, La-General hospital in the La-Dadekotopon district, Pentecost hospital in the La-Nkwantanang district and the Cocoa Clinic in the Accra metropolitan Assembly all in the Accra Region. These were deemed appropriate for the study because of the high patronage of their services by diabetes patients in the Greater Accra Region.

Figure 2: Map of study Site

Source google map,10/10/2018

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3.2.1 Pentecost Hospital

Pentecost hospital is located at Madina in the La-Nkwatanang district. This facility is accredited to the National Health Insurance Scheme. This gives the opportunity to people to access medical care irrespective of their socio-economic status. In the year 1999 this facility got approval of the Government of Ghana and registered with Christian Health Association of Ghana i.e. (Municipal Health Directorate,2018). It has about 91819 patients annually and average of 252 on daily basis with 294 staff capacity (Pentecost Hospital,2018). It comprises of both outpatient and in patients' departments. There are adequately stocked and well-equipped departments which includes: maternity, emergency, laboratory, pharmacy and functional operating theatre. There are also a number of specialist clinics consisting of diabetes, Obstetrics and Gynecology, Pediatrics, General surgery, Ophthalmology and Dentistry. The diabetes clinics is run on Mondays with the other clinic days schedule on other week days excluding weekends. The general out patients Department is functional 24hrs daily and seven (7) days in a week (Pentecost Hospital,2018).

3.2.2 La General Hospital

La General hospital is located in the Ladekotopon Municipality of Greater Accra region of Ghana. This facility is a government hospital with 421 staff capacity. It was formerly established as a polyclinic in 1963 and later became a hospital in 2004.This facility has well equipped maternal department, laboratory, pharmacy general surgery. This facility has the strength of 180 bed capacity. La General Hospital has a number of operational specialist clinics which includes but not limited to: Diabetes clinics, Obstetric and gynecological clinics, child welfare clinics, physiotherapy and Neonatal intensive Care Unit (NICU). Diabetes clinic days are on Wednesdays with 50 patients attending on a usual day.

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3.2.3 Cocoa Clinic

Cocoa Clinic,which is located at Kaneshie was established in 1973 mainly for Cocoa Board staff and dependents but now has services open to all patients. It is currently among the biggest clinics in Accra Metropolis. In total, the clinic has 40 bed capacity with 7500 monthly OPD attendants and 150 monthly ward admissions. It renders both General and Specialist Care Service which includes: Radiology, Asthma, Internal Medicine, Pediatrics, Gynecology, Eye, Ear Nose and Throat services and General Surgery. This is a very busy clinic known for its super standard Endoscopy Examinations. The Laboratory and Pharmacy are fully equipped. The diabetes Clinic runs every Wednesday with estimated number of 50 patient a day. This clinic is located at a very vantage area making it accessible to clients.

3.3 Study population

The study population was made up of diabetic patients attending the Out Patient Department and on medication for the last 12 months during the time of the study, irrespective of their sex.

3.4 Inclusion criteria

The study included adults with diabetes residing in Greater Accra for not less than 12 months attending diabetes clinic and were ready to participate in the study.

3.5 Exclusion criteria

The study excluded diabetes patients who were seriously ill and required medical attention. Also, first time visitors to the clinic were excluded from the study. These people may not give a true picture of the outcome of the study

3.6 Sample size calculation

Required sample size for this study was calculated based on the following estimates: 95% confidence level (Z), prevalence (P) of longitudinal continuity of care is 35% (Napolitano et

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al., 2016). Using the formula by Cochran (Cochran, 1977), the sample size was calculated by substituting the above estimates into;

n= sample size n=?

Z= Z-score z=95%=1.96

P= prevalence p=0.35

q= 1-prevalence q=0.65

D= Margin of error d=0.05

$$\mathbf{n = Z^2\, p\, (1\text{-}p) / e^2}$$

$$\frac{(1.96)^2 \times (0.25 \times 0.65)}{(0.05)^2} =$$

$$\frac{0.87396}{0.0025} =$$

349.58= 350

Adjusting for a 10% non-response rate gives; 1.1 × 350 = 385. Therefore, a minimum of 385 respondents were required for this study.

3.7 Sampling procedure

The study employed stratified proportionate technique hospitals with high diabetes attendance were listed under CHAG, Quasi and Government hospital. Simple random sampling was used to select one facility from each category. In all, three (3) facilities that had functional diabetes clinics was randomly selected. Each of the randomly selected facilities were representative of private, public and quasi-governmental hospitals. Respondents to be interviewed from each facility were determined proportionately to the number of diabetes patients in the facility. This

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was done by taking average daily attendance at each facility. The sample sized gotten from the field was based on estimated average attendance which varied per day. Some of the days recorded more attendance than the other resulting to a higher sample size than the calculated. Systematic sampling was used to select respondents based on daily attendance in each facility as shown in table 1. From this table, LA General has average total population to be 300 per month. The sample size for a day is calculated by dividing the average monthly sample size by the number of attendances on that specific day. The value derived determines how each participant were selected.

Table .1 Allocation of participants

Facility	Total population	Sample Size
La General Hospital	300	116
Cocoa Clinic	300	116
Pentecost Hospital	440	169
TOTAL	1040	402

3.8 Pretesting

The questionnaire was adapted and modified from a number of sources including Gulliford et al.(2016). It was tested at the Trust hospital. Identified anomalies in the questionnaire included missing variables, and some spelling mistakes were corrected before the final data was collected.

3.9 Data collection

Face to face interview technique was used using a structured questionnaire. Trained researche assistants with the background of this field of interest collected data for this study. The questionnaire was used to collect data on socio-demographics, patient's experience on

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longitudinal, flexible, relational and team continuity of care and satisfaction of patients on diabetes care.

3.10 Quality control

For quality control, the same questions were used for all eligible participants. Data collection procedure was adhered to in order to obtain valid results. Prior to data collection, research assistants with background in the field of interest, were trained by the principal investigator to understand the data collection process as well as familiarising themselves with the questionnaire. Data collection tools pre-tested in one facility which was not involved in the actual survey. Data collected was randomly selected and cross checked with the questionnaire

3.11 Data analysis

Data was collected using ODK questionnaire and exported into Stata version 15.1. The data set was cleaned and analysed. Frequency distribution was done to compute proportions on all the dimensions of continuity of care and patient satisfaction in this study. Mean age and mean continuity of care scores and their respective standard deviations were computed. Tests of significance on socio-demographic factors that influence relational continuity was done using Chi Square, with statistical significance set at $p \leq 0.05$. Multiple logistic regression analysis was used to measure the strength of association between relational continuity and patient satisfaction adjusting for other independent variables. This was done by first running a bivariate analysis between all the domains of continuity (longitudinal, relational, flexible and team continuity and Patients Satisfaction and adherence to management of diabetes) and all other independent variables (Age, sex, ever attended school, Level of Education, Occupation, Marital status, Religion, Insurance type,). Independent variables with p-values ≤ 0.05 in bivariate analysis were fitted in the final multiple logistic regression model to assess the strength of association using the Adjusted Odds Ratio (AOR) with 95% confidence interval (CI).

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3.12 Variables

In this study, two variable types were used. Dependent and independent variable.

3.12.1 Dependent variable

Dependent variables in this study were continuity of care (longitudinal continuity, relational continuity, flexible continuity, team continuity) and patients' satisfaction of care.

3.12.2 Measurement of Continuity of Care and Patients Satisfaction of Care

Continuity of care,in this study was measured using composite indices which were generated from questions that measured each of the four dimensions of continuity whereas patients' satisfaction was measured using opinionated structured statement like, 'in general, I am satisfied with my diabetes management" with a range of responses from strongly disagree to strongly agree. A 5-point Likert scale was used to measure patient's perception of Relational, Flexible and Team COC. The following questions were asked to measure the domains of COC. For relational COC, these questions were asked: "There exist a strong interpersonal relationship between me and my doctor", "my doctor knows my familial circumstances very well", "my doctor is concerned about me and my doctor knows my daily activities very well." For Flexible COC: "It is easy to communicate with my health provider about my diabetes", ''I must wait for a long period of time before I speak with a doctor or nurse at the hospital for my diabetes care", "It does not take long to obtain an advice urgently from a doctor or nurse." For Team COC: "In general, my diabetes care is well coordinated", "These health providers transfer information very well to each other (Health provider for the purpose of this study means health practitioner)", "These health providers work together very well", "They share an agreed plan of treatment for my diabetes care", "The care of these health providers is very well connected", "The health providers know very well from each other what they do", "I feel the healthcare providers communicated well with each other whenever I visit the hospital".To estimate for the scores for flexible, relational and team continuity, items under these three dimensions of

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continuity were rated from 1 to 5 points (from strongly disagree to strongly agree). Scores of the responses to these items were added for each person and divided by their highest possible score (Aller et al., 2013). Each continuity score was then changed into categorical variables which resulted in two categories for each dimension of continuity of care: low (<0.75) and high (≥0.75) experience of continuity of care (Lustman et al., 2015).

In addition, longitudinal continuity of care was measured using the Most frequent provider continuity of care index. For the purpose of this study, longitudinal Continuity of care (LCOC) was skewed towards the most frequently visited health care provider or physician visited by the patient. These questions were used to measure LCOC." How many times have you visited /seen a doctor in relation to the management of your diabetes for the past year? And In the past one year how many different doctors have you visited/seen in relation to the management of your diabetes?" This index measured the extent of concentration of patients' visit among different physicians. This was done by computing the number of usual providers seen and the overall number of visits to the health care physician for the past 12 months. Thus, Most Frequent Provider Continuity of care (MFPC) given by max = $\frac{(n1,n2,n3 \ldots\ldots nk)-1}{N-1}$

Where:

- Max= (n1, n2 n3…. nk) =number of visits to the most frequently visited provider
- N = total number of visits(Saultz, 2003).

The value of LCOC index ranged from 0 to 1 with values close or equal to one indicating more concentration of visits leading to high longitudinal continuity of care. Assuming patient made a regular visit to the same physician, the LCOC values equated to 1 projecting perfect longitudinal continuity of care. If a patient visits different physician on each visit, the LCOC index becomes 0, indicating low concentration of visits leading to low continuity of care. Longitudinal continuity values were transformed into categorical variables which were further sub categorized into two sub sections based

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on the distribution of the scores (Napolitano et al., 2016). An eight-item questionnaire on patients' satisfaction was adapted from Consumer assessment of health care provider and systems (CAHPS) to assess patients' satisfaction of diabetess management by clinicians. For the purpose of this research one of the modified items read as "In general I am satisfied with my diabetes management." The response was based on a 5- point Likert scale(1- strongly disagree,5-strongly agree).Total satisfaction score was calculated from sum of responses (10-50) with a higher score indicating a greater satisfaction of diabetes care management (Hojat et al., 2011)

3.12.3 Independent variable

Independent variable in this study were variables identified to be more likely to predict occurrence of a dependent variable. Some of these variables included, age, sex, number of years suffering with the disease (diabetes), place of residence, family history of the disease, occupation, marital status and religion. The table 2 shows the study variables.

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3.12.4 Study variables

Table 2 Study Variables

Variable	Operational definition	Scale of measurement
Age	Age of respondent at last birthday	Ratio
Sex	Sex of respondent	Nominal
Education	Highest level of education of respondent	Ordinal
Occupation	Occupation of respondent	Nominal
Marital status	State of being in a marital union	Nominal
Religion	Religion affiliation of respondent	Nominal
Tribe	Ethnicity of respondent	Nominal
Residence	Place of residence of respondent	Nominal
Number of years with diabetes	Number of years respondent has been diagnosed with diabetes	Ratio
Family history of diabetes	Presence or absence of diabetes in the respondent's family	Nominal
Relational continuity	Composite variable to measure relationship between diabetic patients and healthcare providers	Ratio
Longitudinal continuity	Composite variable to measure diabetes care over time	Ratio
Flexible continuity	Composite variable to measure diabetes care adjusted to meet the needs of the patient	Ratio
Team continuity	Composite variable to measure the collection role of health professionals in diabetes care	Ratio

3.13 Ethical considerations

Ethical approval for the study was obtained from the Ghana Health Service (GHS) Ethics Review Committee (GHS-ERC038/02/19). At the selected facilities, permission was sought from the Hospital Administrator and medical superintendent. Before interview, the content, study procedures and study design were fully disclosed to eligible participants. Consent was sought from eligible participants after disclosure. Participants were informed that participation was entirely voluntary, and they had the right to refuse to participate or withdraw from the

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study at any time and, their decisions would not affect service delivery at the facilities. Two consent forms were signed or thumb printed. One was in the custody of the participants whiles the other was kept by the principal investigator. In order to ensure confidentiality, names of study participants were not used during data collection or reporting process, rather, codes were given to each participant identifiable by selected facility.

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CHAPTER FOUR

4.0 RESULTS AND FINDINGS

4.1 Demographic characteristics

Four hundred and one (401) participants were involved in this study. The mean age of all participants was 61.6 ± 11.1 More participants were aged 60-69 years (33.2%) and 50-59 years (28.9%). The least (2.5%) age group were participants aged less than 40 years. Majority of diabetic patients involved in this study were females (73.1%). Out of the 401 participants, a large proportion (79.3%) stated they had some formal education whereas 20.7% had no formal education. The educational level of the participants ranged from primary school (12.6%), JHS/JSS/Middle School (45.3%) and technical/vocational school (17.0%). Only 6.3% indicated they had tertiary. Regarding employment, more than half (71.6%) the participants stated they were employed in the informal sector, with only 5.5% employed in the formal sector and 3.2% of the participants were unemployed. About 20% were retired. Most participants were currently married (77.6%), 20% currently not married and 1.7% of single participants. Christians recorded the highest proportion of the respondents (76.8%) followed by Muslims (23.3%). In addition, 66.1% indicated they had a family history of diabetes against 33.9% with no history of diabetes. Almost all (99.5%) stated they had health insurance with as low as 2.8% having private health insurance.Table 4.1 shows the demographic characteristics of study participants.

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Table 4.1: Demographic characteristics of respondents

Variable	Frequency	Percentage
Mean (SD)	**61 .6 (11.1)**	
Age (years)		
< 40	10	2.5
40-49	46	11.5
50-59	116	28.9
60-69	133	33.2
70+	96	23.9
Sex		
Male	108	26.9
Female	293	73.1
Education		
Ever attended school	318	79.3
Never attended school	83	20.7
Level of education		
Primary	40	12.6
JSS/JHS/Middle School	144	45.3
SSS/SHS/O & A 'Level	60	18.9
Technical/Vocational	54	17.0
Tertiary	20	6.3
Employment status		
Unemployed	13	3.2
Formal sector worker	22	5.5
Informal sector worker	287	71.6
Retired	79	19.7
Marital status		
Single	7	1.7
Currently married	311	77.6
Currently not married	83	20.7
Religion		
Christianity	308	76.8
Islam	93	23.2
Family history of Diabetes		
Yes	265	66.1
No	136	33.9
Health insurance		
Yes	399	99.5
No	2	0.5
Type of insurance		
NHIS	399	97.2
Private insurance	11	2.8

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4.2 Extent of continuity of care

Extent of COC is summarized in figure 2 below. The highest extent of continuity of care was team continuity (0.9) followed by RCOC and FCOC of care (0.8). LCOC was the least experienced by patients (0.5).

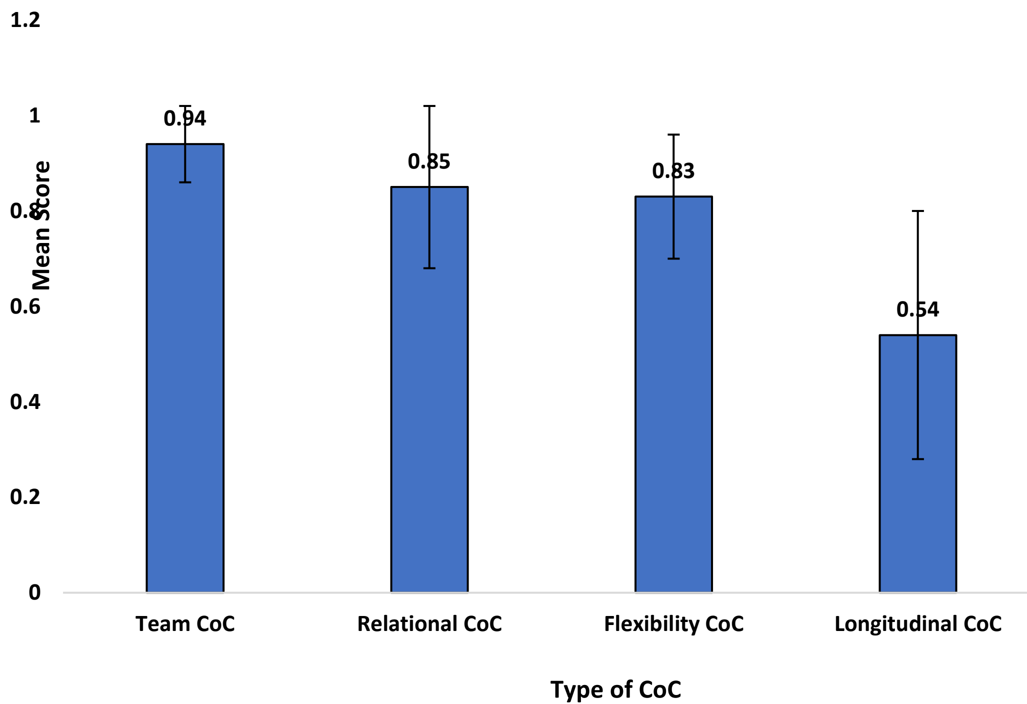

Figure 3: Extent of Continuity of Care

4.3 Proportion of patients with continuity of care

Figure 3 below summarized the prevalence of the four levels of COC measured in this study. Majority (97.3%) of the respondents had high TCOC while 68.1% had high RCOC. Furthermore, 65.3% of respondents had high FCOC with only 20% with high LCOC.

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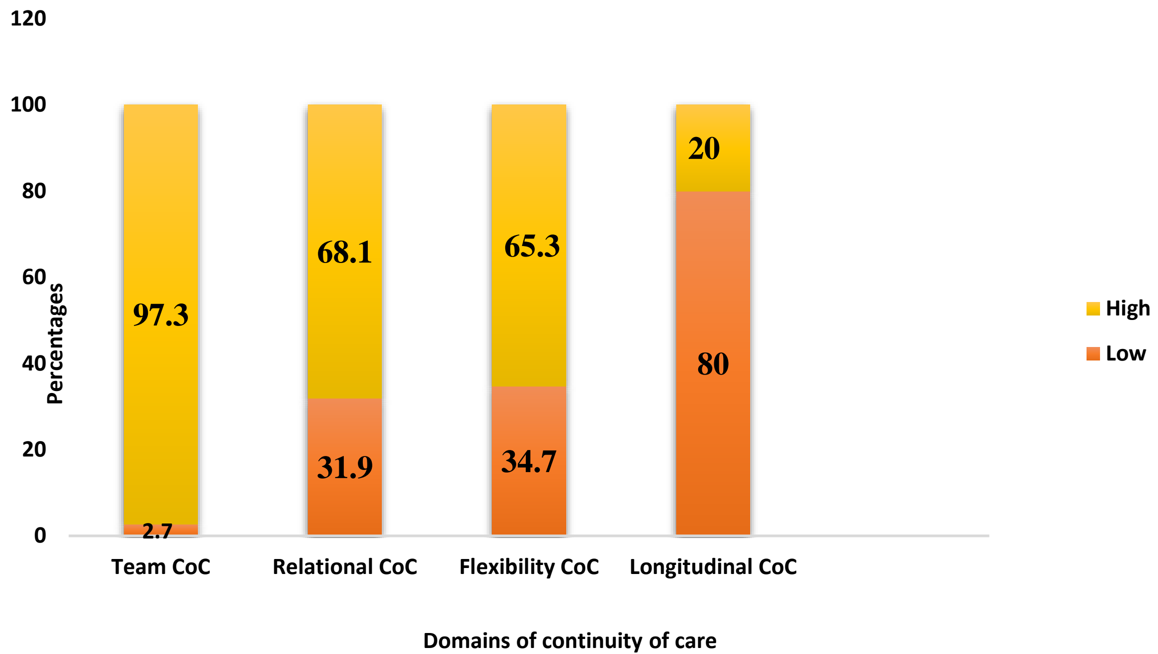

Figure 4: Proportion of Continuity of Care

4.4. Effect of relational continuity of care on patient satisfaction with received care

Patients with high RCOC were 2.43 times more likely to be satisfied with care received as compared to those with low RCOC. The difference was however not statistically significant (AOR=2.43; 95% CI: 0.55-10.70; p=0.239).

Diabetics who had private insurance were 94% less likely to be satisfied with care received compared to those with NHIS (AOR=0.06; 95% CI: 0.01 -0.39: p=0.003). Patients with high LCOC were1.8 times more likely to be satisfied with their diabetes management as compared to those with low LCOC although not statistically significant (AOR=1.80; 95% CI: 0.25-12.89; p=0.558).Table 4.2 summarizes the effect of relational COC on satisfaction of care.

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Table 4.2: Effect of relational continuity of care on patient satisfaction with received care

	COR	AOR
Variable	**OR (95% CI) p-value**	**OR (95% CI) p-value**
Sex		
Male	Ref	Ref
Female	2.06(0.45-9.38) 0.348	1.87(0.39-9.00) 0.429
Type of insurance		
NHIS	Ref	Ref
Private insurance	0.05(0.01-0.28) <0.001	0.06(0.01-0.39) 0.03
Relational continuity of care		
Low	Ref	Ref
High	2.79(0.68-11/47) 0.154	2.43(0.55-10.70) 0.239
Flexibility continuity of care		
Low	Ref	
High	1.56(0.56-11.59) 0.223r	
Team continuity of care		
Low	Ref	Ref
High	2.22(0.12-41.31)	0.24(0.03-17.32) 0.513
Longitudinal continuity of care		
Low	Ref	Ref
High	1.50(0.18-12.68) 0.707	1.80(0.25-12.89)

4.5 Association between background characteristics, patients' satisfaction and relational continuity of care

Table 4.3 shows there were statistically significant association between sex (χ^2 =10.67, p=0.001, α=0.05), ever attended school (χ^2 =16.81, p<0.001, α=0.05), level of education (χ^2 =14.48, p=0.006, α=0.05), religion (χ^2 =6.85, p=0.009, α=0.05) and relational continuity of care. Furthermore, there were also statistically significant association between patients' satisfaction (χ^2 =6.29, p=0.043, α=0.05) and RCOC. However, there was no statistically significant difference between age and relational continuity of care (χ^2 =7.66, p=0.105, α=0.05).Details of this is shown in table 4.5 below.

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Table 4. 3: Association between background characteristics, patients' satisfaction of care and relational continuity of care

Variable	Relational Continuity of Care			
	Low n (%)	**High n (%)**	**Total n (%)**	**Chi-square (p-value)**
Age (years)				7.66 (0.105)
< 40	4(3.1)	6(2.2)	10(2.5)	
40-49	20(15.6)	26(9.5)	46(11.5)	
50-59	27(21.1)	89(32.6)	116(28.9)	
60-69	43(33.6)	90(33.0)	133(33.2)	
70+	34(26.6)	62(22.7)	96(23.9)	
Sex				10.67(0.001) **
Male	48 (37.5)	60(22.0)	108(26.9)	
Female	80(62.5)	213(78.0)	293 (73.1)	
Ever attended school				16.81(<0.001) **
Yes	86(67.2)	232(85.)	318(79.3)	
No	42(32.8)	41(15.0)	83(20.7)	
Level of education				14.48 (0.006) *
Primary	18(20.9)	22(9.5)	40(12.6)	
JSS/JHS/Middle School	35(40.7)	109(47.0)	144(45.3)	
SSS/SHS/O & A 'Level	21(24.4)	39(16.8)	60(18.9)	
Technical/Vocational	7(8.1)	47(20.3)	54(17.0)	
Tertiary	5(5.8)	15(6.5)	20(6.3)	
Occupation				5.27(0.153)
Unemployed	5(3.9)	8(2.9)	13(3.2)	
Formal sector worker	5(3.9)	17(6.2)	22(5.5)	
Informal sector worker	100(78.1)	187(68.5)	287(71.6)	
Retired	18(14.1)	61(22.3)	79(19.7)	
Marital status				2.13(0.345)
Single	2(1.6)	5(1.8)	7(1.7)	
Currently married	94(73.4)	217(79.5)	311(77.6)	
Currently not married	32(25.0)	51(18.7)	83(20.7)	

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Religion				6.85(0.009) *
Christianity	88(68.7)	220(80.6)	308(76.8)	
Islam	40(31.3)	53(19.4)	93(23.1)	
Health insurance				0.94(0.332)
Have health insurance	128(100.0)	271(99.3)	399(99.5)	
Have no health insurance	0(0.0)	2(0.7)	2(0.5)	
Type of insurance				2.61(0.106)
NHIS	122(95.3)	266(98.2)	388(97.2)	
Private insurance	6(4.7)	5(1.8)	11(2.8)	
Patients' satisfaction				6.29(0.043) *
Not satisfied	0(0.0)	2(0.7)	2(0.5)	
Partially satisfied	4(3.1)	1(0.3)	5(1.3)	
Satisfied	124(96.9)	270(98.9)	394(98.2)	
Flexibility continuity of care				4.67(0.031) *
Low	84(65.6)	55(20.2)	139(34.7)	
High	44(34.4)	218(79.8)	262(65.3)	
Team continuity of care				24.12(<0.001) **
Low	11(8.6)	0(0.0)	11(2.7)	
High	117(91.4)	273(100.0)	390(97.3)	
Longitudinal continuity of care				46.59 (<0.001) **
Low	77(60.2)	244(89.4)	321(80.1)	
High	51(39.8)	29(10.6)	80(19.9)	

*** Statistically significant for $p \leq 0.05$, ** $p \leq 0.001$, *** $p \leq 0.001$**

4.6 Factors associated with Relational Continuity of Care

Binary logistic regression was performed to determine factors associated with RCOC. Patients' adherence to diabetes management, FCOC and LCOC of care were factors associated with high RCOC.The logistic regression model showed that patients with good adherence to diabetes management were 2 times more likely to experience high RCOC compared to these with poor

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adherence (AOR=2.10; 95% CI: 1.02 – 4.34; p=0.045).Additionally,diabetics with high FCOC were 5 times more likely to have high RCOC as compared to those with low FCOC(AOR=5.10; 95% CI: 3.10 -8.38; p<0.001). However, patients with high LCOC were 71% less likely to experience high RCOC as compared with those with low LCOC (AOR=0.29; 95% CI: 0.16 – 0.52; p<0.001).Though not statistically significant, patients who were highly satisfied with diabetes care were 21% more likely to have high RCOC as compared to those with low satisfaction of care (AOR=1.21; 95% CI: 0.06 – 26.18; p=0.901).

Table 4.4: Factors associated with Relational Continuity of Care

	COR	**AOR**
Variable	**OR (95% CI) p-value**	**OR (95% CI) p-value**
	Ref	
Sex		
Male	Ref	Ref
Female	2.13(1.35-3.37) 0.001	1.36 (0.78 – 2.35) 0.273
Patients' satisfaction		
Not satisfied	Ref	Ref
Partially satisfied	0.07(0.01-2.33) 0.135	0.26 (0/01 – 11.53) 0.491
Satisfied	0.43(0.02-9.11) 0.591	1.21 (0.06 – 26.18) 0.901
Flexibility continuity of care		
Low	Ref	Ref
High	7.57(4.73-12.10) <0.001	5.10 (3.10 – 8.38) <0.001 **
Team continuity of care		
Low	Ref	Ref
High	5.35(3.12-9.15) 0.006	16.25 (0.91 -29.03) 0.058
Longitudinal continuity of care		
Low	Ref	Ref
High	0.19(0.12-0.30) <0.001	0.29 (0.16 – 0.52) <0.001 **

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CHAPTER FIVE

DISCUSSION

5.0 Introduction

This study sought to determine the extent of continuity of care for all the four dimensions and satisfaction of care between diabetic patients and their care Providers in Greater Accra Region. The study shows there was high team, flexible, relational continuity of care among diabetics. However, there was low longitudinal continuity of care. The study also revealed relational continuity of care was not associated with patients' satisfaction of diabetes care. In addition, patients with high RCOC experience are more likely to be more satisfied with the care received as compared to Patients with low RCOC although not statistically significant. Adjusting for all other factors, flexible continuity and longitudinal continuity of care have positive effect on relational continuity

5.1 Extent of Patients' Experience of Continuity of Care

Continuity of care as reported is beneficial in enhancing good communication between patients and physicians, increased adherence to follow-up and appointments, improved outcomes and accrued knowledge on diseases. In view this, high-quality medical care and attention are vital in reducing the risk complications in relation to diabetes management.

This study determined the extent of longitudinal, relational, flexible and team dimensions among diabetic patients. The study found fairly high extent for all dimensions of continuity except longitudinal Continuity. Although LCOC recorded the lowest mean score in this study, it is consistent with other studies that has recorded mean LCOC score to be the lowest of all the dimensions of COC (Gulliford, Naithani, Morgan, 2006 & Mendes et al,2015). Similarly, a study conducted in US by Baker et al. (2017) recorded mean score 0.61 for LCOC which is close but slightly higher than the average LCOC score 0.5 in this study. This reflects

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the fact that only few diabetics experience an ongoing health pattern of care with the same physician at the same facility over time (Tessler, Willis, & Gubman, 2014). This could also mean that high proportions of diabetic patients are seeing multiple physicians, making health care fragmented. In addition, low experience of longitudinal continuity by patients in this study could be attributed to several other possible reasons: One of these could be patients not being able get responsive care from their usual health providers in times of emergencies and so tend to consult the most convenient, available and accessible health provider. This results in discontinuity of care if health care is not well coordinated (Lustman et al., 2015&Alazri et al.,2007). Other contributing factors to low experience of LCOC could be referral issues and migration of patients scheduled for regular consultation. Patients who are referred and or are in transit are more likely to miss out on repeated visits to same health provider because of constant change of address (Alazri, Heywood, Neal, & Leese, 2007b). This could lead to fragmentation of care and hence low longitudinal continuity (Rinner et al., 2016). More so, low experience of longitudinal continuity may affect the quality of care received leading to negative health outcomes. Patient who visits other physicians other than their usual physician are likely to experience duplication of medical tests resulting to high medical cost as well as other negative consequences that stem from consulting different specialists (Waibel et al., 2018). Similarly, low experience of longitudinal continuity of care could lead to high cost for prescription. This is proven by a study conducted in US which demonstrated that people who experienced high longitudinal continuity for a period of ten years had lower prescription cost as compared to those with low LCOC(White et al., 2016). Another study conducted showed that patient who had high LCOC had 13% reduced rate of hospital admissions as compare to those with low LCOC. Most patients with low experience of LCOC from this study complained they do not get reminders for appointments with their usual providers and hence making them forget appointment schedule. This makes them miss out on some scheduled meetings with

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usual health providers. In view of this, the record units of facilities should take up the responsibility of coordinating diabetes care such that regular reminders are sent to patient on their appointment days.

It is worth noting that, substantially high number of diabetics have their care well-coordinated among various teams of health professionals as well as experience a strong sense of harmonisation among their health providers in regards to their diabetes management. This is very needful in the current times of comorbidities. Coordination of shared care among different health experts could result to the best health outcomes. High team continuity experience is an indication of high quality and satisfaction of care among patients whereas for doctors it creates the platform to increase knowledge, confidence and skills (WHO, 2018).

In addition, both relational and flexible continuity recorded fairly high COC, 68.1% and 65.3% respectively. This means that over 65% of diabetic patients get appropriate and consistent health support anytime it is required and more also have high sense of affiliation to their health providers. This finding reflects the fact that most diabetes specialist adapt to care protocols to provide suitable care to the changing needs of their patients, resulting to satisfaction of care received as well as other positive health outcomes (WHO, 2018).Diabetics in this study had an appreciable number experiencing high relational continuity. As a result, most patient have established a strong relationship with their care providers. This level of Patient-Doctor friendship contributes to trust and user satisfaction of health service leading to high experience of quality of care (Lustman et al., 2015). Although most patients prefer an existing and strong affiliation to their doctors, relational continuity was not the highest in terms of proportion among all the domains of continuity (Aboulghate, Abel, Elliott, & Parker, 2012).

Additionally, existence of polypharmacy practices, work schedules and knowledge regarding medication are likely to influence the extent of continuity.

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5.2 Effect of relational continuity of care on patient satisfaction with received care

Patients' satisfaction is vital for improved healthcare. This study found a positive association of patient satisfaction on relational continuity. Patients with high RCOC experience are more likely to be satisfied with the care received as compared to Patients with low RCOC although not statistically significant. This means that most of the diabetics who have a strong interpersonal bond with their physicians are more satisfied with their treatment process. A systematic review done by Saultz & Albedaiwi, (2004) shows how some studies are consistent with our study while others disagree with our finding. It was reported by the same study done by Saultz and colleagues that, high RCOC between patients and health practitioners increases patient satisfaction with care by seven times. Patients who have a relationship with their physicians are most likely to be satisfied with care and have a high probability of further seeking health service from the same health provider (generally a doctor or nurse) on regular basis. Contrasting view from another study reveals that an existing relationship with clinician may not essentially lead to the patient being satisfied with care given (Adler, Vasiliadis, & Bickell, 2010). Previous studies suggested that patients who know and are known by their health provider develop some level of trust and loyalty which improves treatment regimen resulting to good outcomes (Georgopoulou, 2018) .

5.3 Factors contributing to relational continuity of care

Relational continuity of care is vital in ensuring that, patients develop an interpersonal relationship with their clinician on regularly basis. This happens when Physician-Patient relationship transcends the usual contact exchange to the Physician being made aware of patients' familial circumstances. Relational continuity of care is important in managing complications and at the same time ensures the wellbeing of patients with diabetes.

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It is evident from the results that flexible continuity, longitudinal continuity has a strong association with relational continuity. However, team continuity of care was not statistically significant with relational COC in this study although the odds were high.

Analysis from this study shows high LCOC did not translate to high relational continuity. This means patients with high longitudinal continuity are less likely to experience high relational continuity as compared to patients with low LCOC.This demonstrates that patients who experience low continuum of care with their usual providers are more likely to experience high RCOC as compared to those with high longitudinal continuity. This finding is un usual of the norm but could be attributed to myriad reasons. Among these possible reasons could be multiple referrals during health service delivery mostly for people with chronic and multiple conditions. A well-established interpersonal relationship can make a physician in charge of a patient refer the patient when necessary since the doctor knows the familial circumstances of the patient. In this case, fragmented care received by patient may be due to the strong interpersonal bond that exists between a patient and the physician. This could be a contributing factor for low experience of relational continuity of patients with high experience of continuum of care with their usual providers. This finding is consistent with a study conducted in US by Baker and colleagues (2017), reflecting the fact that a strong interpersonal Physician-Patient bond puts the physician in position to assume responsibility for coordination and integration of the patients' care. This level of Provider-Patient relationship is most desired by patients since it creates a sense of friendship and affiliation and personal trust for the health providers resulting to non-confusing treatment plan, low prescription cost and high adherence to medication as well as reduce hospitalization (Reid et al., 2002). Additionally group practice in most health facilities in Ghana could also account for low LCOC with high RCOC.The emerging number of part-time and salaried doctors in general practice results in seasonal rotation of practising physician which distorts order of repeated visits to a particular physician

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over time. Continuity and patient access to care certainly declines when physicians work for less hours (Panattoni et al., 2015).This finding is similar to a study conducted by Aboulghate et al.(2012) which revealed that in UK, COC declined some time ago in the country and this decline was attributed to reduction in doctor's working hours and an increase in part time work of doctors. A consistent view from other studies reveal that having a usual health provider does not always translate into a strong interpersonal bond with patient thus. In similar sense, established LCOC experience for patients does not necessarily mean that their expectation of quality of care will be met (Adler et al., 2010 ;White et al,2016 & Sault 2003). However, this research is in contrast to what was reported in Australia where diabetic patients continuously seek health care from the same practitioner for a period of 6 years hence increasing relational continuum of care experience (Overland, Yue, & Mira, 2001). In addition, diabetes-based services in hospitals with complex systems of care and high staff turnover is closely linked to low continuity of care (Gulliford et al., 2006). Other studies revealed that most patients were satisfied based on the quality of health services rendered other that repeated visits as well as quick access to same physician (WHO, 2018). A study done by Alazri et al. (2007) shows healthcare providers who often are responsible for treating the same patient might miss the slow development of the disease which however could be detectable by another healthcare provider.

This finding revealed flexible continuity of care contributes to relational continuity. Health providers who render responsive care outside their appointment schedule in trying times of the patient build a strong trusted relationship with their patient. In addition, patient who get sporadic response to care in the face of their changing health needs are 5 times more likely to develop a strong sense of affiliation towards their care health provider as compared to patients who do not experience suitable and timely care in emerging health needs. It is demonstrated from literature that, timely provision of complementary and timely care to the changing needs

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of patients improves on quality and satisfaction of care received (Reid et al., 2002).Though not statistically significant, patients who were satisfied with diabetes care were more likely to have high experience of relational continuity of care.Similarly, diabetics who had their care coordinated among different health providers were 16 times more likely to have high experience of relational continuity of care as compared to those with low coordination of care among different teams of health workers although no strong statistical association was established. It is the desire of most patients to have a good and a lasting relationship with their physicians but this is dependent on many factors (Aboulghate et al., 2012).

5.5 Study limitations

The study was self-reported which makes it dependent on the honesty and recall potent of the patient. More so, recruitment of participants for this study was done in the health facilities so may not reflect continuity of care experience among diabetics at home. Some recruited respondents declined participation. That notwithstanding, the study used a standardized and well validated continuity of care and Patient's satisfaction questionnaires to collect data.

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CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Majority of diabetics in this study experienced high continuity of care in three of the four dimensions of continuity of care. The study demonstrated most diabetes patients had their care well-coordinated among multiple health providers leading to positive health outcomes. Additionally, it is evident from the study that most diabetics had responsive and timely care from their health providers in the face of difficulty times in health. This means most health providers in the diabetic clinics used for this study have flexible plans in the management of the changing needs of patients and are able to adapt to care protocol to suit peculiar cases of patients as in when it faces up.

Similarly, most of diabetics had a strong interpersonal bond with their health providers. This is known to be a good attribute of the quality of care received pertaining to diabetes management. The high continuity of care translated into high satisfaction of diabetes care received from health care providers. High team and flexible continuity of care positively influenced attainment of high relational continuity of care.

6.2 Recommendations

1. The management team of the various health facilities should put up adequate appointment scheduling system where by required visits days of patients will be arranged such that they meet their usual providers on appointment dates except for referral cases. This may result in high experience of longitudinal continuity.
2. The record unit of the facilities should take up the responsibility of coordinating diabetes care such that regular reminders are sent to patient on their appointment days. This may lead to patient consulting their usual provider on diabetes clinic days

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3. Further research is needed in order to understand the extent to which longitudinal continuity affect relational continuity.
4. The management body of facilities should plan and design diabetic services for patients to be able to adequately asses all the domains of continuity.

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APPENDICES

Appendix 1

Questionnaire for continuity of care among diabetic patients and their caregivers in Accra

DEMOGRAPHIC INFORMATION		
QN	**QUESTION**	**RESPONSE**
1	How old were at your last birth day?	....
2	Sex of respondent	Male [ ] Female [ ]
3a	Have you ever attended school?	Yes [ ] No [ ]
3b	What is your highest level of education?	1. No formal education [ ] 2. Primary School [ ] 3. JHS/JSS/Middle School [ ] 4. SHS/SSS/Technical/Vocational/O &A'Level [ ] 5. Tertiary [ ]
4	What is your occupation?	1.Teacher 2.Nurse 3.Doctor 4.Acountant 5.Police officer 6.Self employed 7. Others…
5	What is your Marital status?	1. Single [ ] 2. Married [ ] 3. Co-habiting [ ] 4. Divorced [ ] 5. Separated [ ] 6. Widowed [ ]
7	What is your religious affiliation?	1. Christianity [ ] 2. Islam [ ] 3. African Traditional [ ] 4. Others ....
8	What's the duration of your diabetes?	……Years……months…………………
9	Do you have any family history of Diabetes?	Yes [ ] No [ ]
10	Do you have any form of health insurance?	Yes [ ] No [ ]
11	What type of health insurance do have?	1.NHIS 2.Private

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We want to know your experiences with health care providers you have contacted in the last 12 months with respect to your diabetes care. For each of the following statements, kindly choose the answer which best describes your opinion. All information provided will be kept confidential. Also, the responses you will provide will in no way affect the health care services rendered to you by your health care providers. The following statement is about your (own) general practitioner (Doctor).

RELATIONAL CONTINUITY **The following statements are about how closely related you have been with your care providers with regards to your diabetes treatment.**					
Statement	**Strongly disagree** [1]	**Disagree** [2]	**Neutral** [3]	**Agree** [4]	**Strongly agree** [5]
12. I know my doctor very well					
13. My doctor usually explains medical processes and tests done for my diabetes					
14. My doctor engages me in decisions about my diabetes					
15. My doctor attends to what I have to say about my diabetes					
16. My doctor knows about my medical history					
17. My doctor knows my familial circumstances very well					
18. My doctor makes the finest decisions about treatment of my diabetes					
19. My doctor is concerned about me					
20. My doctor knows my daily activities very well					
21. There exist a strong interpersonal relationship between me and my doctor					

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LONGITUDINAL CONTINUITY **The following statements are about how long your care providers have been in touch with you with regards to your diabetes treatment.**	
Statement	**Response**
22. In the past one year, how many times have you spoken with a doctor at your diabetes care hospital about your disease?	
23. In the past one year, how many times did the hospital send you appointments or reminders for your diabetes	
24. In the past one year, how many times have you visited/seen a doctor in relation to the management of your diabetes?	
25. In the past one year, how many different doctors have you visited/seen in relation to the management of your diabetes?	

Provider	Number of visits	Comments (e.g referred etc)
1		
2		
3		
4		
5		
6		
Total		

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FLEXIBLE CONTINUITY **The following statements are about how flexible your care providers are with regards to your diabetes treatment.**					
Statement	**Strongly disagree** [1]	**Disagree** [2]	**Neutral** [3]	**Agree** [4]	**Strongly agree** [5]
26. It is easy for me to express the state of my condition to my usual doctor or nurse					
27. My doctor or nurse responds well to me whenever I have a problem with diabetes					
28. I must wait for a long period of time before I speak with a doctor or nurse at the hospital for my diabetes care					
29. It does not take long to obtain an advice urgently from a doctor or nurse					
30. I was adequately informed about my dietary needs in order to plan my own healthy daily meals					

TEAM CONTINUITY **The following statements are about the cooperation between care providers in hospital (e.g. Between several specialist or between specialist and nurse)** **If this section does not apply to you, then skip to the next section.**					
Statement	**Strongly disagree** [1]	**Disagree** [2]	**Neutral** [3]	**Agree** [4]	**Strongly agree** [5]
In general, my diabetes care is well coordinated					
31. These care providers transfer information very well to each other.					
32. These health providers know my medical history					
33. These health provider work together very well					
34. They demonstrate an agreed plan of treatment for my diabetes care					
35. The care of this health providers is very well connected.					
36. These health providers know very well from each other what they do.					
37. I feel the healthcare providers communicated well with each other whenever I visit the hospital					

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APPENDIX 2

PARTICIPANT CONSENT FORM

STUDY TITLE: CONTINUITY OF CARE AMONG DIABETES PATIENTS AND THEIR CARE GIVERS

PARTICIPANTS' STATEMENT

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and satisfactorily explained to me in a language I understand (English □, Twi □, Ga □). I fully understand the contents and any potential implications as well as my right to change my mind (ie withdraw from the research) even after I have signed this form.

I voluntarily agree to be part of this research.

Name or Initials of Participant………………………….. ID Code ……………………………..

Participants' Signature ………OR Thumb Print………… OR Mark (Please specify)…………

Date:………………

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INTERPRETERS' STATEMENT

I interpreted the purpose and contents of the Participants' Information Sheet to the afore named participant to the best of my ability in the (Twi □, Ga □).) language to his proper understanding.

All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter……………………………

Signature of Interpreter……………………….. Date:………………

Contact Details

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STATEMENT OF WITNESS

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language he/she understood (Twi □, Ga□)

I confirm that he/she was given the opportunity to ask questions/seek clarifications and same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name:…………………………

Signature……………. OR Thumb Print ………... OR Mark (please specify)………………..

Date:……………………………

INVESTIGATOR STATEMENT AND SIGNATURE

Brief statement or declaration that investigator has given enough information to participants to make informed decisions.

I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Researcher's name……………………………………….

Signature ………………………………………………….

Date………………………………………………………..

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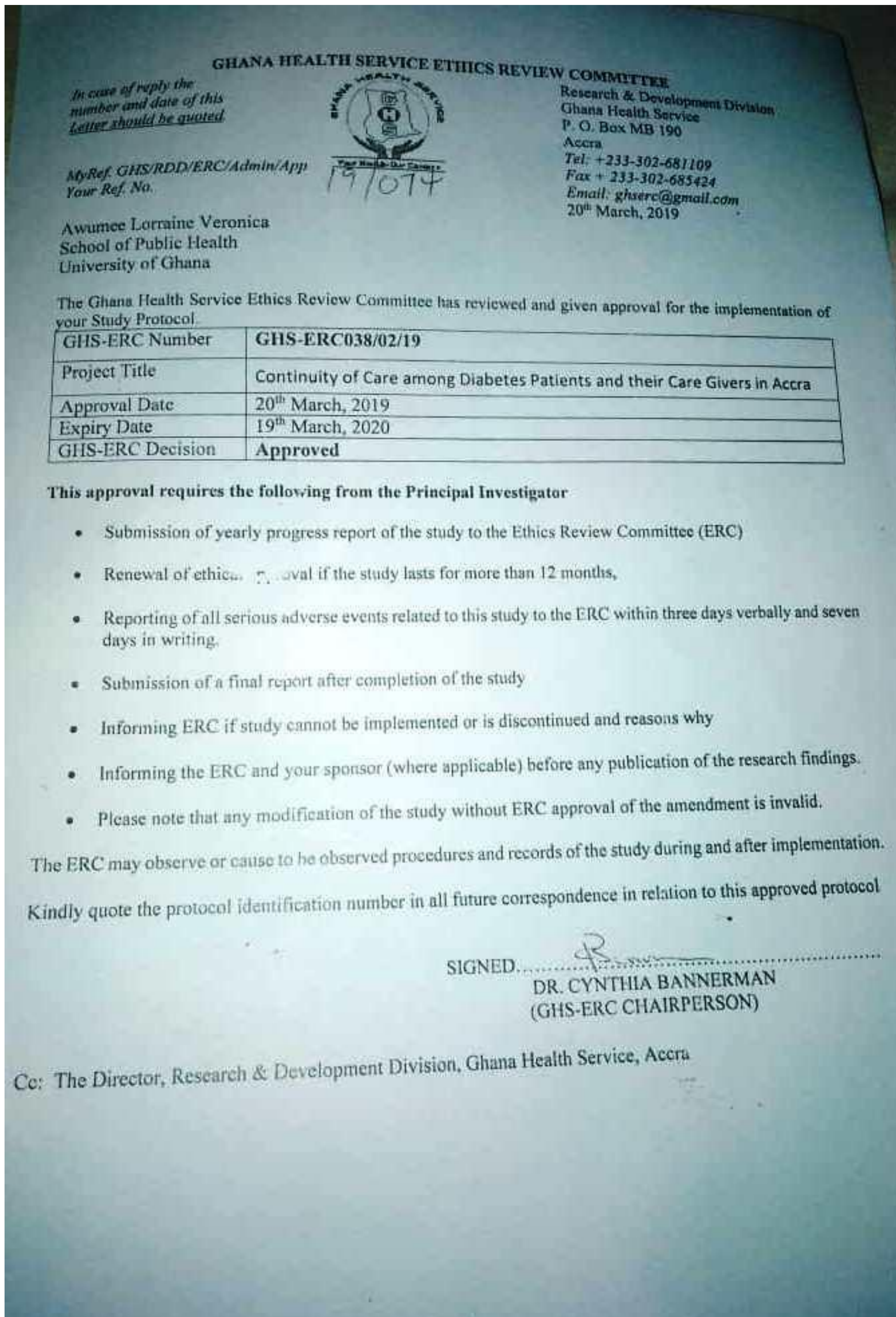
Appendix 3: Ethical Clearance



GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

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

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Tel: +233-302-681109
Fax + 233-302-685424
Email: ghserc@gmail.com
20th March, 2019

MyRef. GHS/RDD/ERC/Admin/App 19/074
Your Ref. No.

Awumee Lorraine Veronica
School of Public Health
University of Ghana

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

GHS-ERC Number	GHS-ERC038/02/19
Project Title	Continuity of Care among Diabetes Patients and their Care Givers in Accra
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