

**SCHOOL OF PUBLIC HEALTH  
COLLEGE OF HEALTH SCIENCES  
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**UTILIZATION OF EYE CARE SERVICES AMONG PATIENTS WITH  
DIABETES ATTENDING THE ENDOCRINE CLINIC OF KORLE BU  
TEACHING HOSPITAL**

**BY**

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**JULY, 2019**

**DECLARATION**

I, Bridgid Akrofi hereby declare that apart from references to other people's work that have been presented and duly cited, this dissertation is my original work.

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.....

**DATE**

**DEDICATION**

To my father, Mr. Solomon Kojo Botchey for his kind words of encouragement.

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My sincere gratitude goes to my supervisor, Dr. Genevieve Cecilia Aryeetey for providing adequate knowledge, guidance and suggestions that contributed immensely to the success of this research.

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## ABSTRACT

**Background:** Diabetes is a key public health challenge that is approaching epidemic proportion worldwide. Utilization of care services among persons diagnosed with diabetes helps in early detection of diabetic retinopathy and also, allows for timely intervention. Evidence shows that the utilization of eye care services among patients living with diabetes, in Ghana is low.

**Objective:** To determine factors associated with utilization of eye care services among patients with diabetes, attending the endocrine clinic of Korle Bu Teaching Hospital.

**Method:** A cross-sectional descriptive study was conducted at the endocrine clinic of Korle Bu Teaching Hospital. The study population comprised of 360 patients with established diagnosis of diabetes. Data was collected by administering a structured questionnaire to the study population between May and June, 2019. Results were analyzed using logistic regression to establish factors associated with use of eye care services.

**Results:** The mean age of the respondents was 45 years. The proportion of respondents who visited the eye clinic within the last 12 months was 21.7%. In addition, there was a significant association between visitation of eye clinic and socio-demographic variables such as sex, age, educational status and occupation, with p-value of 0.022, 0.000, 0.021 and 0.003 respectively. The overall level of knowledge of diabetic retinopathy, among respondents was poor. More than half (58.5%) of the respondents had no knowledge of diabetic retinopathy and the need for annual eye screening. Factors associated with utilization of eye care services revealed that, respondents with high education had higher odds of using eye care services and those with knowledge of diabetic retinopathy were also 2.7 ( $p=0.077$ ) times more likely to utilize the eye clinic. Patients who paid for health services by both out of pocket and NHIS ( $p=0.031$ ), NHIS ( $P=0.000$ ) and provision of eye referral letters by physicians to respondents ( $p=0.024$ ) were some of the enabling factors

significantly associated with the use of eye care services. In addition, a little over two-thirds of the respondents (41.1%) did not visit the eye clinic because they felt it was not necessary.

**Conclusion:** The results suggest that, factors like education, lack of knowledge of diabetic retinopathy and the need for routine eye screening services, affordability and accessibility accounted for low proportion of patients with diabetes, receiving the recommended annual eye screening services at the eye clinic.

**Keywords:** Diabetes, diabetic retinopathy, eye screening, use of eye care services

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## LIST OF ABBREVIATIONS

<b>DM</b>	-	Diabetes Mellitus
<b>DR</b>	-	Diabetic Retinopathy
<b>GHS</b>	-	Ghana Health Service
<b>IDF</b>	-	International Diabetes Federation
<b>KATH</b>	-	Komfo Anokye Teaching Hospital
<b>KBTH</b>	-	Korle Bu Teaching Hospital
<b>NHIS</b>	-	National Health Insurance Scheme
<b>TTH</b>	-	Tamale Teaching Hospital
<b>WHO</b>	-	World Health Organization
<b>LMICs</b>	-	Low - and middle – income countries

## **DEFINITION OF KEY WORDS**

**DIABETES:** This refers to a disease that affects the body's ability to produce or use insulin to process blood glucose.

**DIABETIC RETINOPATHY:** It is a microvascular complication caused by diabetes which can lead to sight loss if not detected in its early stages.

**EYE SCREENING:** A brief examination that looks for potential vision problems among patients.

**USE OF EYE CARE SERVICES:** Comprehensive eye examination offered to patients who visit the eye clinic.

## CHAPTER ONE

### INTRODUCTION

#### 1.0 Background

Diabetes mellitus refers to a collection of metabolic disorders evidenced by high blood glucose. Consistent high blood glucose levels may generally cause vascular damage to the eyes, hearts, kidneys and nerves, resulting in numerous complications. As a result of these complications, people living with diabetes develop series of health challenges resulting in high treatment cost, a reduction in quality of life and a higher mortality. (Beana – Diez, Penafiel & Subirana ., 2016). Generally, there are two distinct types of diabetes and these are, Type I and Type II. The Type I diabetes refers to a chronic condition where the pancreas produces inadequate or no insulin whereas the Type II diabetes manifests itself when the body becomes resistant to insulin or when the pancreas cannot produce adequate insulin (Ikegami et al., 2004).

Globally, the total estimated number of people living with diabetes would increase from 382 million in 2013 to 592 million by 2035. Majority of these patients live in low- and middle-income countries (Guariguata, 2014). A similar study revealed that, globally there are approximately 451 million people aged between 18 – 99 years living with diabetes. By the year 2045, these figures are expected to have increased to 693 million (Cho et. al., 2018).

A study conducted in 216 countries among adults aged between 20 – 79 years divulged that, the global prevalence of diabetes was 6.4% in the year 2010. However, this figure was anticipated to rise to 7.7% affecting 439 million by 2030. Likewise, between the

same year intervals, there will be a 69% upsurge in number of adults with diabetes in LMICs and a 20% increase in urbanized countries (Shaw et al., 2010).

Internationally, the prevalence of diabetes is increasing and Sub – Sahara Africa is not excluded. It is estimated that type 2 diabetes accounts for 90% and population prevalence span from 1% to 12% in rural and urban Kenya respectively. The proportion of diabetic retinopathy also ranged from 7 – 63% (Hall et al., 2011).

In Africa, where diabetes was once rare has witnessed a rise in the condition. It is estimated that about 39,000 people suffered from Type 1 diabetes in 2013 in Africa and about 6.4% new cases occurring in about 100,000 adults and in children less than 14 years old. In addition, the prevalence for Type 2 diabetes was also 4.9% among adults aged between 20 – 79 years. These figures are anticipated to increase with numbers rising from 19.8 million in 2013 to 41.5 million in 2035 (Peer et al., 2014).

In Ghana, statistics on the prevalence of diabetes mellitus is scanty and obsolete. The crude prevalence of diabetes in Ghana in 2002 was 6.3% (Amoah et al., 2002). A similar study revealed that, 97% of the 1460 recruits were diagnosed with Type 2 diabetes in Ghana (Danquah et al., 2012). Diabetic retinopathy, which is a specific microvascular complication of Diabetes stands out as the leading cause of acquired visual loss worldwide (Klein, 2007).

Globally, with the rising number of diabetes, diabetic retinopathy and sight threatening diabetic retinopathy have been projected to increase to 191.0 million by 2030 (International Diabetes Federation, 2015). The prevalence of diabetic retinopathy associated with blindness was high in Sub-Saharan Africa and Southern Asia, where 1 out of 39 blind people had blindness due to diabetic retinopathy and 1 out of 52 visually impaired people acquired it due to diabetic retinopathy (Leasher et al., 2010).

There has been major advances made in screening, early diagnosis and prompt treatment of diabetic retinopathy among diabetic patients, which allows, prevention of about 98% of visual challenges (Ferris et al., 2003).

With the heightened awareness of diabetic retinopathy, risk factors, excellent glycemic control and access to the diagnosing programmes at eye clinics, there is a decrease in the prevalence of diabetic retinopathy in the advanced countries like U.S, Australia and the European Countries (Wrong et al., 2009). However, diabetic retinopathy screening services remain a challenge in LMICs where access to eye care professionals and eye care services are inadequate (Murthy et al., 2012). The use of eye care services is one of the basic requirements of diabetes care that leads to prompt diagnosis and management of diabetic retinopathy (Wild, 2014)

In Ghana, accessibility to eye care professionals by patients with diabetes remains a challenge because the eye care centres are not affiliated to the endocrine clinics, and this is evident at the three medical tertiary institutions in the country, namely; Korle Bu Teaching Hospital (KBTH), Komfo Anokye Teaching Hospital (KATH) and Tamale Teaching Hospital (TTH).

Patients who utilize the eye care services are less likely to develop blindness from diabetic retinopathy than patients who do not utilize the eye clinic (Ocansey et al., 2013).

The aim of this study was to determine factors associated with utilization of eye care services among patients with diabetes, attending the endocrine clinic of Korle Bu Teaching Hospital.

### **1.1 Problem statement**

Diabetic retinopathy is the third leading cause of blindness in persons aged between 20 and 65 accounting for 22.7% of blindness among patients living with diabetes (Ryan et al., 2012). The problem exists because of the rising prevalence of diabetes globally, especially in LMICs together with poor compliance with utilization of eye care services among patients living with diabetes.

A successful diabetic retinopathy screening programme includes sustainability and accessibility of the screening services with highly trained eye care professionals. This facilitates the use of eye care services among patients with diabetes, which leads to early detection and prompt management of diabetic retinopathy (Scanlon et al., 2015). The use of eye care services among patients with diabetes has received little attention in LMICs (Konsoulis et al., 2014). This is a similar challenge affecting patients of the endocrine clinic of Korle Bu Teaching Hospital. It is obvious that utilization of eye care services among patients with diabetes is quite low. The reasons accounting for poor utilization of eye care services abound. Due to lack of ophthalmoscopes at the various consulting rooms, physicians do not carry out annual eye screening assessment, because of this patients with diabetes are expected to visit the eye clinic at least once a year to see the ophthalmologists for the recommended annual eye screening services. In fact, the eye clinic is not affiliated to the Endocrine Clinic and so these patients are expected to visit the ophthalmologist at the eye clinic (3km away) at least once annually for routine eye screening services. This situation needs to be addressed in order to save these patients from irreversible blindness. (Bhavsar, 2019). Statistics available at the biostatistics department of the eye clinic revealed that, about 12.2% of patients with diabetes had undergone routine eye screening services from October 2014 to October 2017 (KBTH, 2017). This suggests that, eye care utilization among these

patients is quite low. Thus, there is a gap of 87.8% from the ideal situation. This is of great public health importance because blindness resulting from diabetic retinopathy has series of consequences that may affect patients and their family as well as the economy of the country. Patients who develop blindness from diabetic retinopathy will become dependent on family members and care givers for activities of daily living. They may also lose their jobs and become financially dependent on family members. Emotionally, they may become withdrawn and depressed because of the blindness. Productivity level will go down if those in the working class in the country suffer from blindness resulting from diabetic retinopathy. If this situation is not addressed, it would subsequently affect the economy negatively.

Diabetic retinopathy is asymptomatic, as such patients do not feel the need to go for eye screening. Adapting Anderson's model of health care utilization to analyze the problem, showed that enabling factors such as accessibility to the eye clinic and staffs, predisposing factors like age , sex, knowledge of diabetic retinopathy, education and need factors like perceived eye health status impeded utilization of eye care services.

Consequently, this study sought to find out whether there were appropriate measures put in place to facilitate utilization of eye care services or patients with diabetes have adequate knowledge of diabetic retinopathy and its effects on their vision or there were factors influencing patient's willingness to undergo eye screening or self – reported reasons deterring patients from visiting the eye clinic. The researcher seeks to address the problem by making findings available to the appropriate authorities to improve eye care services among patients with diabetes. This will go a long way to prevent blindness associated with diabetic retinopathy and increase utilization of eye care services among patients living with diabetes in Ghana.

## **1.2 Justification of the study**

Globally, diabetic retinopathy is among the common leading causes of blindness among patients with diabetes, of an estimated 285 million people with diabetes, approximately one - third have developed diabetic retinopathy (Lee et al., 2015). It is an established fact that patients with diabetes who do not utilize the eye care services usually report to the eye clinic with advanced stages of diabetic retinopathy, which often leads to blindness (Wild, 2014). This confirms the statistics at the biostatistics department of the eye clinic, that only 12.2% of patients with diabetes had utilized eye care services from 2014 to 2017. The sure way to reduce blindness from diabetic retinopathy is to ensure that patients with diabetes utilize the eye clinic for diabetic eye screening services. This necessitated the study. A successful diabetic retinopathy screening services is not available at the endocrine clinic due to lack of ophthalmoscopes, and the need to determine proportion of patients who utilize the eye clinic, availability of diabetes eye health information for patients and self-reported reasons deterring patients from visiting the eye clinic need to be investigated. The mission of Vision 2020 Global initiative is to eliminate the main causes of all preventable and treatable blindness as a public health issue by the year 2020, thus this research is extremely important because findings would serve as a source of information for providing comprehensive eye care services that will prevent blindness from diabetic retinopathy among patients with diabetes in Ghana. It would also provide literature and serve as a stepping stone for further research.

## **1.3 Conceptual framework**

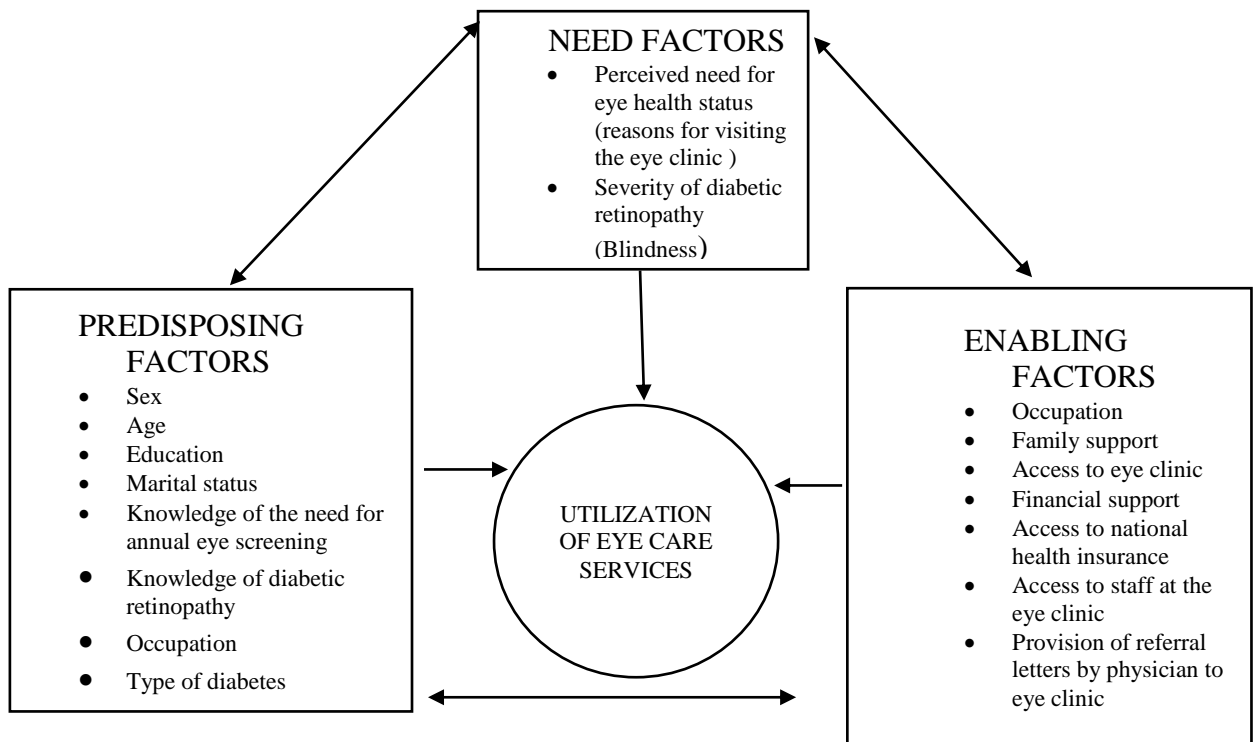
The conceptual framework (Fig 1:1) was adapted and modified from the Anderson Health Care Utilization Model (1995). This model conceptually aims at describing

indicators leading to the use of health care services. It also posits that, the usage of health care services is potentially determined by three dynamics, namely; Predisposing factors, Enabling factors and Need factors. The Predisposing factor is characterized by factors like health beliefs, race age and sex. Enabling factors, on the other hand could be one's community, family support, access to health insurance among others. The Need represents actual and perceived need for health care services.

Adapting this framework for the use of eye care services among patients with diabetes, the following conditions were discovered to either facilitate or impede access to eye care services. These were accessibility to the eye clinic and staffs, diabetic eye health information or financial constraints, poor attitude of staff and long waiting time respectively.

Consequently, for patients to take part in eye screening services, they must first recognize that they stand at risk of becoming blind. They must also have knowledge of the need for annual eye screening services. As shown in fig 1.1, utilization of eye care services is directly influenced by the predisposing factors among diabetic patients, the resources available to them, as well as their perceived needs.

## CONCEPTUAL FRAMEWORK



**Figure 1.1: The Anderson's model of health care utilization (1995 )**

### 1.4 Objectives

The objectives of this study consist of general and specific.

#### 1.4.1 General objective

To determine factors associated with the utilization of eye care services among patients with diabetes, attending the endocrine clinic of Korle Bu Teaching Hospital.

#### 1.4.2 Specific objectives

- 1 To determine the proportion of patients with diabetes of the endocrine clinic who utilized eye care services in the past one year.

- 2 To assess the level of knowledge of diabetic retinopathy and its effects on vision among patients with diabetes of the endocrine clinic.
- 3 To determine factors associated with the utilization of eye care services among patients with diabetes of the endocrine clinic.
- 4 To identify self - reporting reasons deterring patients with diabetes of the endocrine clinic from visiting the eye clinic.

### **1.5 Research questions**

1. What proportion of patients with diabetes of the endocrine clinic utilized the eye clinic in the past one year?
2. What is the level of knowledge of diabetic retinopathy and its effects on vision among patients with diabetes of the endocrine clinic?
3. What factors are associated with utilization of eye care services among patients with diabetes of the endocrine clinic?
4. What are the self - reported reasons deterring patients with diabetes of the endocrine clinic from visiting the eye clinic?

### **1.6: Outline of dissertation**

The outline of this dissertation consists of six chapters and each chapter is summarized as follows;

Chapter one: The background provides information into the scopes of the prevalence of diabetes and diabetic retinopathy at global, Africa and Ghana among patients with diabetes. Thus utilization of eye care services among patients with diabetes is necessary. The clarity of the problem being investigated is properly articulated to make the rationale for this study appropriate. Justification of the

study, conceptual framework as well as objectives of the study are also presented in this chapter

Chapter two: This chapter espouses literature on the topic under study. The following sub-headings were presented; Diabetes and diabetic retinopathy, utilization of eye care services and factors associated with it. This is followed by assessment of knowledge of diabetic retinopathy and self – reported reasons for not visiting the eye clinic

Chapter three: This chapter describes the research methods. A descriptive cross sectional design was used and the study area was Korle Bu Teaching Hospital. Patients diagnosed of diabetes constituted the study population. Cochran sample size formula was used to calculate the sample size of 360 for this study. Sampling method and data collection technique constituted simple random sampling technique and questionnaire. Data processing and analysis was done using SPSS version 20. Ethical clearance was obtained from Institutional Review Board of Korle Bu Teaching Hospital after the researcher had submitted an introductory letter from University of Ghana, School of Public Health.

Chapter four: This chapter elaborates on how data was collected from respondents and analyzed. Findings from this study are presented according to the following sections; Predisposing factors (socio demographic characteristics of respondents and knowledge of diabetic retinopathy), relationship between knowledge of diabetic retinopathy and sex, proportion of respondents who utilized eye care services, relationship between socio demographic characteristics and visit to the eye clinic within 12 months, relationship between need factors / reasons for clinic visitation and sex, factors associated with utilization of eye care services and self-reported reasons for not visiting the eye clinic.

Chapter five: This chapter provides in details findings of the study in relation to the reviewed literature. Section one presents the utilization of eye care services in the past one year. Section two presents knowledge of diabetic retinopathy while section three also presents factors associated with the utilization of eye care services. Section four also elaborates on self- reported reasons for not visiting the eye clinic.

Chapter six : This chapter clearly summarizes the overall findings of the study and presents the sections : summary of the study, conclusions of the study, contribution to knowledge, recommendations, limitation of the study and future research.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter presents a review of literature associated with the constructs of this study. It focuses on previous studies done in relation to utilization of eye care services among patients with diabetes. It begins with a review on diabetes and diabetic retinopathy, utilization of eye care services and factors associated with it. This is followed by a review on assessment of knowledge of diabetic retinopathy, and finally, a review on self – reported reasons for not visiting the eye clinic

#### **2.1 Diabetes and diabetic retinopathy**

The number of adults living with diabetes had risen to 422 million in 2014. Diabetes, which is a chronic illness is characterized by high levels of blood glucose and has chronic complications such as cardiovascular disease, diabetic retinopathy, nephropathy, neuropathy, among others. The most common type of diabetes, known as type 2 often occurs in adults when the body fails to produce enough insulin or becomes extremely resistant to insulin. Type 1 diabetes ,which was once called Juvenile Diabetes or Insulin – Dependent Diabetes, is also a chronic condition among children below the age of 18 years whose pancreas produce little or no insulin at all. However, during the sixty – second World Health Assembly in the year 2009, it was revealed that about 314 million people lived with visual impairment and out of that number 45 million were blind, of whom 90% lived in LMICs . Diabetic retinopathy, which is a vascular disease of the retina, accounted for almost 4% of the global blindness representing about 4 million of blind people. (WHO, 2012.)

Findings from the Global Burden of Disease Study revealed that, diabetic retinopathy was responsible in one of every 39 cases of blindness and this is one important public health problem. Progressively there has been an increase in the prevalence of diabetes mellitus and diabetic retinopathy and this burden is also expected to increase further (Leasher, 2010). Persons living with diabetes will increase to 366 million by 2030, with this increase, diabetic retinopathy, and vision threatening diabetic retinopathy will also rise to 191.0 million and 56.3 million respectively. Currently, there are about 20 million Africans suffering from diabetes and this number is expected to increase by 109% over the next 20 years (Bourne et al., 2018).

Statistics revealed that, of the 28 million Ghanaians, 270 thousand are expected to have diabetes, 93,000 to have diabetic retinopathy and 27,000 to have vision threatening diabetic retinopathy. (Ghana Health Service, 2018)

The prevalence rates for diabetic retinopathy and vision threatening diabetic retinopathy were 3.4% (4.1 million) and 0.75% (899000) respectively; thus 1 of every 12 persons had advanced vision threatening diabetic retinopathy (Kempen, 2004). The prevalence of diabetic retinopathy and vision threatening diabetic retinopathy among United States adults was estimated around 28.5% and 4.4% respectively (Zhang et al., 2010). Diabetic retinopathy was responsible for 14.4% of all registered blindness in persons aged between 16 -64 years in the United Kingdom (Liew et al., 2014). Similarly, a study done in China recorded 27.9%, of the prevalence of diabetic retinopathy (Xie et al., 2008).

A study conducted on the prevalence of diabetic retinopathy in West Africa specifically, Ghana and Nigeria reported 17.9% (Amoah, 2003).

Adherence to the strategies for managing diabetic retinopathy aids in prevention of blindness among patients with diabetes. It is very essential to screen for diabetic retinopathy since majority of patients with this condition shows no symptoms until macular edema manifest itself. In that regard, prompt routine diabetic eye examination and the right referral for treatment are important to maintain vision. Treatment modalities for diabetic retinopathy include anti-vascular endothelial growth factor (VEGF), retinal laser photocoagulation and vitreo-retinal surgery. Retinal photocoagulation refers to a minimal invasive procedure that uses laser burns to abate blood vessels leakages in the retina that potentially results in retinal conditions such as diabetic retinopathy and macula oedema. Whiles it is generally unable to restore vision that has already been lost, it can abate the risk of further visual loss that could result in blindness (Tang et al., 2018).

A research conducted in the United States, established the fact that, annual eye screening plus laser photocoagulation halved the incidence of blindness associated with diabetes among patients who were at a higher risk in the year 2013. Findings from this study concluded that annual or biennial screening should be the standard of care for early detection of diabetic retinopathy and prompt treatment (Brown & Summers, 2013).

## **2.2 Utilization of eye care services**

Globally, adherence to the utilization of eye care services among patients with diabetes remains a challenge, especially in LMICs (Shaw et al., 2017). In order to reduce the prevalence of blindness from diabetic retinopathy and improve the quality of life, comprehensive eye examination should be more accessible, available and affordable to all patients with diabetes (Wild, 2014). Series of studies have been done on utilization

of eye care services in Ghana (Apio- Adih, 2014). However, there is scarce information about the use of eye care services among patients with diabetes.

There are clinical guidelines that recommend annual eye screening for patients with diabetes (Bhavsar, 2019). A study on diabetic eye screening services in Malaysia revealed that, out of an estimated 2,373 patients with known diagnosis of diabetes, only 55% had an eye examination. Among patients who had undergone eye examination, 32.8% had the last examination within one year and 17.4% more than two years ago. Thus, the lack of compliance with eye screening guidelines and prompt referral of sight threatening diabetic retinopathy led to higher incidence of blindness in these patients (Goh et al, 2006).

A similar study also revealed that only 45.05% known patients with diabetes ever had their eyes examined even though majority (73.5%) of them utilized other health care facilities for diabetic care (Letchuman et al., 2010). The proportion of patients with diabetes receiving recommended annual screening in China was low, 66.7% of the participants did not visit the ophthalmologist at the eye clinic for their annual eye screening (Wang et. al 2010).

A review done in India showed that majority of patients with diabetes (61.1%) didn't visit the eye clinic for periodic eye checkups (Nithin et al., 2017). Findings from these data have revealed that, appropriate eye care seeking behavior coupled with annual eye screening services at the eye clinic, usually aid in prompt detection of diabetic retinopathy and prevention of blindness. Unfortunately, there was scarce information on utilization of eye care services among people living with diabetes in LMICs.

### **2.3 Factors associated with the utilization of eye care services among patients with diabetes**

Health care utilization is potentially determined by three dynamics, namely predisposing factor, enabling factors and need factors (Andersen 1995 ). There are three known primary factors that could aid in the prevention of blindness among patients with diabetes. These enabling factors are, availability, affordability and accessibility of eye care services which could facilitate the prevention of blindness, globally. In addition, other predisposing factors such as demographic, personal and socio-economic factors may act as barriers to utilization of eye care services. (Ntsoane et. al., 2010).

Various studies have documented certain predisposing and enabling factors as being significantly associated with utilization of eye care Services and increased risk of development of diabetic retinopathy. Low proportion of patients with diabetes utilizing eye clinic is associated with inadequate knowledge of diabetic retinopathy, insufficient recommendation of regular eye examination by physicians and accessibility to the eye clinic (Wang et al., 2010). Similar studies indicated that, there were primarily three enabling factors namely, availability, affordability and accessibility of eye care centres that could enhance the utilization of eye care services (Kaufman, 2012). On the other hand, there were also predisposing factors such as demographic, personal and socio-economic factors which could be associated with poor utilization of available, accessible and affordable eye care services (Erasmus et al. 2010).

In another study done in South Africa, it was published that, only 39% of the respondents in a rural community survey had their eye examined within five years despite the accessible, and affordable eye care services. The study further revealed that predisposing and enabling factors such as cost, lack of awareness, cultural beliefs and

personal factors were barriers to the use of the eye care centres. This poor utilization of eye services was attributed to be one of the causes of irreversible visual loss or blindness among patients with diabetes (Oduntan et. al. 2010).

A major reason for poor utilization of eye care services in LMICs was affordability of eye care services, impacted by cost and financial status of patients with diabetes. Thus, the cost of eye care services were not affordable to patients as such, conditions like diabetic retinopathy which could have been managed effectively at an earlier stage are not attended to and it eventually result in low vision and blindness (Vashist et al., 2011 ). There are certain risk factors, namely, type and duration of diabetes mellitus, age, sex and blood glucose levels that facilitate the progression of diabetic retinopathy among patients with diabetes. Type 2 diabetes could go unnoticed for a long period of time because it has a subtle onset. Due to this, patients may already have diabetic retinopathy at the time of diagnosis. On the other hand, Type 1 diabetes is detected early in its course of the disease, and so patients do not develop retinopathy until years after the diagnosis is made. (Klein et al., 1994). Studies had shown that the development of diabetic retinopathy potentially increases after puberty. Twenty years after patients have been diagnosed of diabetes, 80% of type 2 patients and nearly all type 1 patients show some signs of retinopathy (Klein, 2007). The duration of diabetes among patients predict the likelihood of developing diabetic retinopathy. A study conducted among patients who had the condition for 5 years and above were twice or more times susceptible to have diabetic retinopathy as compared to patients who have had the condition for less than 5 years (Rasoulinejad et al., 2015). The age of patients also, has a key role to play in the development of diabetic retinopathy. This was also shown in a study conducted among patients with diabetes aged between 20 -45 years who had a prevalence of 22.9% , compared with those in the 45 – 65-year group who

also had 38.5%. This shows that development of diabetic retinopathy increases with age (Patz & Smith, 2011).

Predisposing factors such as age and sex are associated with utilization of eye care services. A study conducted in University college of Ibadan showed that the average age (57.8 years ) of patients with diabetic retinopathy was extremely higher than the average age (48.9 years ) of those without the condition ( Adeyinka & Pedula , 2014). A study conducted in West Africa, specifically in Ghana and Nigeria revealed that the prevalence of diabetic retinopathy in men (18.1%) was slightly higher as compared with women (Amoah et al., 2003). A similar study conducted in Tehran also reported that, it was more likely for women to seek eye care services than men (Foutouhi et al., 2006).

Need factors represent actual and perceived need for health care services (Andersen, 1995). Thus, patients with diabetes who are conscious of their eye health would utilize eye care services. A study done in University of California revealed that women have higher health care utilization than men (Bertakis et al., 2000). This suggests that, women with either low eye sight or blindness would seek curative treatment than men. Poor blood glucose control is also a potential risk factor for diabetic retinopathy development. A study conducted in Nigeria established that, a large proportion of patients with diabetic retinopathy had poor blood glucose control (58.3%) as compared with patients with a well control blood glucose level (Adeyinka et al., 2008).

#### **2.4 Assessment of knowledge of diabetic retinopathy**

Comprehension, by patients on diabetic retinopathy helps them to recognize the need for annual eye screening at the eye clinics. Inadequate knowledge of diabetic retinopathy has been blamed for delays in the use of eye care services as well as a gap

in communicating information between physicians and patients. Eye health information on diabetic retinopathy in electronic and print media would also help patients to gain knowledge. A study of the knowledge, awareness and eye care seeking behavior among patients with diabetes in Saudi Arabia suggested that, the awareness level of diabetic retinopathy was satisfactory (92.4%). However, only 10.5% of the patients had knowledge on the frequency recommended for routine eye examinations at the eye clinics. This acquisition of knowledge was directly influenced by education level, the source of patient information, place of residence and frequency of follow up visits at the eye clinics (Fallatah, 2018).

In Tanzania, over two-thirds of patients with diabetes attending the regional hospital did not know that, diabetic retinopathy was one of the complications of diabetes that could cause blindness (Ramaiya, 2005). A similar study also revealed that, people with diabetes were at times unaware of the complications and seriousness of diabetic retinopathy if left untreated (Foma et al, 2013). In the same vein, late diagnosis of diabetic retinopathy due to delay in the utilization of eye care services has also been linked to poor patient knowledge (Lartyel, 1997).

In a study conducted in Ghana on the magnitude, pattern and level of awareness of diabetic retinopathy showed that only 19.5% of the patients with diabetes, knew that diabetes causes diabetic retinopathy even though the prevalence of diabetic retinopathy was found to be 49.0% (Akpalo, 2003).

## **2.5 Self -reported reasons for not visiting the eye clinic**

Self - reported reasons that affect the compliance with yearly visits to the eye clinic abound. A review done in in South Africa revealed that the main reasons for non-

compliance among patients with diabetes were lack of information, negligence, busy work schedules and lack of finance (Arnolds., 2016 ).

A study in South India also showed that 50.5% of the respondents cited “my eyes were okay at the time, “while 38.6% also cited financial cost” as the reason for the follow-up delay at the eye clinic (Natarajan et al., 2017). A similar study conducted in Tanzania showed that, among 2003 patients interviewed in the study, 50(24.6% ) visited the eye clinic while 153 (75% ) did not. Financial cost was self -reported by 35.3% of patients who did not visit the eye clinic (Mtuya et al., 2016 ).

One of the self – reported reasons among patients in LMICs was affordability, as such patients who could not afford the cost of eye care services do not visit the eye clinics and therefore, conditions like diabetic retinopathy which could have been treated at an earlier stage are not attended to and often result in low vision and blindness (Chandrasheka et al., 2012). On the contrary, a study done in South Africa revealed that, only 39% of respondents in a rural community survey, visited the eye clinic within five years despite accessibility and affordable eye care services (Oduntan et al., 2010 ).

## **2.6 Summary of chapter two**

The above literature has revealed that, poor utilization of eye care services among patients with diabetes results in a higher prevalence of diabetic retinopathy. Majority of patients (61.11%) didn’t visit the eye clinic for periodic eye checkups (Nithin et al., 2017). Patients who utilized the eye care services were less likely to develop blindness from diabetic retinopathy than patients who did not utilize the eye clinic (Ocansey et al., 2013). There is a gap in utilization of eye care services among patients with diabetes because statistics available at the biostatistical department of the eye clinic of KBTH

revealed that, only 12.2% of patients with diabetes had undergone routine eye screening services from October 2014 to October 2017 (KBTH 2018)

The research questions of this study have been supported by the discoveries in literature. Consequently, this study sought to determine factors associated with poor utilization of eye care services among patients attending the endocrine clinic of Korle Bu Teaching Hospital. An area that requires supplementary research is evaluation of the impact of diabetic retinopathy education strategies on utilization of eye care services.

The next chapter elaborates on the study design and methods applied in the collection of data for analysis.

## **CHAPTER THREE**

### **METHODS**

#### **3.0 Introduction**

This chapter describes how the study was conducted. It presents the methods and design of the study, a concise description of the study area and the study population as well as the sample size, sampling method, data collection, data handling, data analysis and ethical consideration.

#### **3.1 Study design**

A descriptive cross sectional study refers to a study in which the disease or condition and potentially related factors are measured at a specific point in time for a defined population. This type of data could be used to assess the prevalence of condition in a population. This necessitated the choice of this study design. Thus a descriptive cross-sectional study was undertaken at the endocrine clinic of Korle Bu Teaching Hospital, among patients with diabetes between May and June 2019.

#### **3.2 Study area**

Korle Bu Teaching hospital is located in Ablekuma South metropolitan district which shares boundaries with Ablekuma central, Ablekuma North and Ashieddu Keteke. It covers an area of 15.1 sqkm. At the 2010 census, there were 1,665,086 people residing in the district. The total number of households in the districts stood at 501,903. 38.4% of the population were under the age 19 and 4% aged 65 and over. This district features a tropical savanna climate. The annual rainfall is about 730 mm with its chief rainy seasons beginning from April and ending in June. The warmer months begins in August and ends in March. As a coastal city, it is vulnerable to the impact of climate

change and sea level rise. The dominant economic activity in this district is fishing and fish mongering activities due to the fact that majority of its communities are along the coast line. It also hosts some business entities like super markets, private health facilities, banks, fuel stations, educational institutions and hostels. It has contributed immensely to the economic development of Accra.

Korle Bu Teaching Hospital which was the study area was established on 9<sup>th</sup> October 1923 with a 200-bed capacity. Currently, the bed capacity of the hospital has 2,000 coupled with 21 clinical and diagnostic departments. The average daily outpatient attendance is about 1,500 and 250 admissions. It is the third largest hospital in Africa and the leading national referral center in Ghana. It has three centres of excellences, namely, the National Cardio thoracic Centre, the National Plastic and Reconstructive Surgery and Radiotherapy. It has other clinical and diagnostic departments such as medicine, child health, obstetrics & gynaecology, surgical/medicine, anesthesia among others.

This study was conducted at the endocrine clinic. It is one of the sub units of the department of medicine that operates outpatient diabetic clinic twice every week. This clinic is about 4 km from the central administration of the hospital and is bounded by the central laboratory block and the department of radiotherapy. Being one of the units of the leading tertiary referral centre in Ghana, it attracts referral cases from all the regions in the country. The endocrine clinic provides medical care and consultation for patients with diabetes mellitus, hypertension and thyroid conditions. It has an annual turnover of about 2,220 and a monthly turnover of 185 diabetic cases.

Furthermore, the clinic has medical expertise of two endocrinologists, one dialectologist, five consultants, two junior doctors, eight nurses, two health care assistants and two orderlies.

### **3.3 Study population**

A study population is known as a well -defined collection of individuals known to have similar characteristics. It is for the benefit of the population that research is done.

The study population was made up of eligible patients diagnosed with diabetes mellitus, of the endocrine Clinic of Korle-Bu Teaching Hospital. The prevalence of diabetic retinopathy in West Africa revealed that, nearly 50% of all patients with diabetes would acquire some form of diabetic retinopathy, and 65% to 75% of those who utilize the eye care services will not show clinical evidence of blindness due to diabetic retinopathy. (Moss et al., 2011). It is based on this finding that the study population was chosen.

### **3.1 Inclusion criteria**

Patients diagnosed with diabetes, who had their particulars in the clinic's register and offered their consent to participate.

### **3.2 Exclusion criteria**

- All patients with comorbid conditions like hypertension and thyroid disorders.
- A patient diagnosed with diabetes who did not consent to participate.

### **3.4. Sample size determination**

The Cochran's sample size formula for proportion ( $N=Z^2 * P (1-P)/D^2$ ) was used for the sample size calculation.

N is the required sample size

Z is the cutoff point along the X-axis of the standard normal probability distribution that represents probabilities matching the 95% confidence interval (1.96)

P is the prevalence of the utilization of eye care services among diabetic patients assumed to be 50%. This is an arbitrary value given that there was no comparative data.

D is precision of study set at 0.05

The sample size looked like as indicated below with the replacement of values in the formula;

$$N = \frac{1.96^2 * 0.5(1 - 0.5)}{0.05^2}$$

$$N = 384$$

For finite population to be corrected, the formula below was used;

$$n = \frac{no}{1+no/N} = \frac{384}{1+384/2200} = 327$$

Where  $n$  is corrected size

$$no = 384$$

$$N = \text{Study population (2220 patients attending the clinic)}$$

Thus, the corrected minimum sample size for this study came to 327 patients and

10% non-response drop 32.7

$$32.7 + 327 = 360$$

Therefore, total sample size = 360 patients.

### **3.4.1 Sampling method**

Sampling is the method of collecting the part or portion of data points from a population characteristics. Sampled data points are further used for statistical analysis purposes.

Simple random sampling technique was the method used for the selection of the respondents for this study. A comprehensive list of patients who met the eligibility criteria of the study were selected from the clinic register and placed in a box. This was done during the clinic day that was run once every week. Thus, 45 patients with diabetes were sampled every week between May and June, 2019. Selection was done randomly from the box, every week within this period until the required sample size of 360 was obtained. This sampling technique was used because each respondent had an equal chance of being selected and it's also ensured fair representation of the study population. (Wilson, 2014).

### **3.5 Study Variables**

The study variables with regard to this study consist of both independent and dependent variables. Some of the independent variables are age, sex, educational level and marital status, while some of the dependent variables are accessibility to the eye clinic, knowledge on diabetic retinopathy, access to national health insurance, access to staff at the eye clinic, family and financial support.

### **3.6 Data collection technique**

Data collection is a process of gathering and measuring information on variables of interest. It allows the researcher to answer stated research questions and evaluates outcomes. Question was the data collection technique chosen because it provides the

most speedy and simple technique for gathering data about a group of individuals. The researcher developed the questionnaire for the study by asking multi-select dropdown questions. The questionnaire consisted of five sections (appendix B). The first section captured information on predisposing factors (socio-demographic of respondents and assessment of knowledge of diabetic retinopathy ) like gender, age, marital status, level of education, occupation, income, duration of diabetes among others. Level of utilization of eye care services and need factors described the second and third part of the questionnaire respectively. The fourth and fifth part of the questionnaire assessed the enabling factors associated with utilization of eye care services and self -reported reasons for not visiting the eye clinic respectively .Each respondent was assigned thirty minutes to answer the questionnaire (Appendix B) by the researcher and the two research assistants after the consent form (Appendix A) was obtained. The administration of the questionnaires was interviewer-administered and self – administered.

### **3.6.1 Training of research assistants**

The research assistants, two registered nurses were trained for one week prior to data collection on proper data collection and interview techniques, as well as on ethical issues.

### **3.7.2 Quality Assurance**

An individual daily check was done to ensure that standards were adhered to. Completed questionnaires were safely kept in well labelled files and stored under lock and key before and after data entry. Data collected was carefully edited and cleaned. Inconsistencies detected were promptly corrected to ensure good quality control.

### **3.6.3 Pretesting of tools**

Pretesting of tools was done at Mamprobi polyclinic in Accra. This was done to check for appropriateness and sequential of questions in order to allocate time for questionnaires to be answered by the respondents.

### **3.6.4 Validity and Reliability of instrument**

The questionnaire was shown to the supervisor for her approval and for fact and content validity before it was used for data collection.

### **3.7 Data processing and analysis**

Data processing is the conversion of data into usable and desired form while data analysis refers to the conversion of raw data into information useful for decision making by users. The analysis of the study was done using SPSS. Descriptive statistics was also done to summarize features of collected information on socio-demographic characteristics of respondents (predisposing factors), level of utilization of eye care services, enabling factors associated with utilization of eye care services, need factors and self-reported reasons for not visiting the eye clinic. Chi square test is used for testing relationship between categorical variables while logistic regression is used to predict a data value based on prior observation of a data. This is considered appropriate for this study because , a chi square test was employed to establish relationship between independent variables and logistic regression was also used to ascertain whether there was significant association between two or more variables ( Factors associated with utilization of eye care services ).

### **3.8 Ethical considerations**

The ethical statement of this study addressed the following principles;

#### **3.8.1 Ethical clearance**

An introductory letter was also obtained from the University of Ghana, School of Public Health (Appendix D) and submitted to Korle Bu teaching Hospital.

Ethical clearance was obtained from the Institutional review board (Appendix C) of Korle Bu Teaching Hospital before going to the field.

#### **3.8.2 Permission from study site**

This institutional approval letter was showed to the Deputy Director of Nursing Services of the endocrine clinic to seek permission before the study was conducted. This enabled the researcher and the two research assistants to meet the patients during their clinic days.

#### **3.8.3 Subjects of the study**

The subjects of the study were made up of patients diagnosed with diabetes mellitus of the endocrine clinic, of Korle Bu Teaching Hospital.

#### **3.8.4 Participants' informed consent**

The purpose of the study was explained to each respondent after which they were presented with an informed consent form. A respondent was enrolled after he or she had agreed to the terms specified on the consent form (Appendix A). Parents of children below the ages of 18 years were also allowed to sign the consent form for their children.

### **3.8.5 Confidentiality and anonymity**

Respondents were assured of confidentiality, as such, interviewing of respondents were conducted in a consulting room where they were not overheard by other patients outside so that everything said was kept confidential between the researcher or research assistants and a particular respondent. Codes were also used to ensure anonymity.

### **3.8.6 Risk and benefits**

There was no direct risk to any respondent in this study, although some of their time was taken in administering the questionnaire. The outcome of the study would be beneficial to policy makers and program managers since it would serve as a reference for policy formulation.

### **3.8.7 Data storage**

Data collected from respondents was kept safe, stored under lock and key and restricted to only the researcher and research assistants.

### **3.8.8 Compensation**

Respondent were assured that they would not incur any financial cost; neither would they be paid for participating in this study. However, 20 minutes of their time would be taken to answer the questions. As a form of appreciation, they would be given one ball pen if they agree to take part in the study.

### **3.8.9 Protocol amendments**

The protocol for this research contained sufficient information which would enhance successful repetition by another site, individual or group, thus there was no protocol amendment to this study,

### **3.9.0 Conflict of interest**

There was no conflict of interest between the researcher and research assistants as well as the institution , where the research was conducted and the respondents.

### **3.9.1 Funding**

Financial contributions towards this study was self-funding.

### **3.9 Summary of chapter three**

This chapter outlines the methods used for the study, in addition to the profile of the study area. This study also employs descriptive cross sectional approach .Patients with diabetes were sampled to obtain a sample size of 360. The entire data was collected within May and June 2019, and analyzed by using SPSS version 20. The next chapter provides the analysis of the major findings from this study.

## CHAPTER FOUR

### RESULTS

#### 4.0 Introduction

This chapter provides details of the data collected and analyzed from respondents based on the statement of problem and the objectives of the study. The findings of this study are presented in sections: Predisposing factors (socio demographic characteristics of respondents and assessment of knowledge of diabetic retinopathy), relationship between level of knowledge of diabetic retinopathy and sex, proportion of respondents who use eye care services, relationship between socio- demographic characteristics and visit to the eye clinic within 12 months, relationship between need factors / reasons for clinic visitation and sex, factors associated with utilization of eye care services and self-reported reasons for not visiting the eye clinic

#### 4.1 Predisposing factors

The respondents' age ranged from 8 years to 87 years with a mean age of 45 years .More than half 198 (55.0%) were females with the rest constituting the male 162 (45.0 % ) population. In ranked order, those married were more than two-fifth 165 (45.8%) followed by the widowed 77 (21.4%) and the divorced 66 (18.3%). Majority of the respondents 324 (90%) had formal education from basic to post- graduate level. In terms of occupation, close to a third 114 (31.7%) were self-employees while 85 (23.6% ) of the respondents were government employees. The rest of the occupation of the respondents were unemployed 70 (19.4%), students 32 (8.9%) and retired 59 (16.9% ). Table 4.1 shows the details of the results.

With regards to assessment of respondents' level of knowledge of diabetic retinopathy, more than half 211 (58.6%) of the respondents had no knowledge of the effect of

diabetic retinopathy on their vision. Although, most of the respondents, close to three-fifth frequency 213 (59.2%), knew that diabetic retinopathy could cause blindness, majority of them 221 (61.4%) had no knowledge on the need for annual eye screening. Table 4.2 displays the results.

**Table 4. 1 Socio - demographic characteristics of respondents**

Variables		Frequency (N = 360)	Percent	Mean (SD)
<b>Age (years)</b>				45 (17)
<b>Age group</b>	8-17	16	4.4	
	18-27	49	13.6	
	28-37	73	20.3	
	38-47	50	13.9	
	48-57	83	23.1	
	58-67	51	14.2	
	68-77	27	7.5	
	77-87	11	3.1	
<b>Sex</b>	Male	162	45.0	
	Female	198	55.0	
<b>Marital status</b>	Single	52	14.4	
	Married	165	45.8	
	Divorced	66	18.3	
	Widowed	77	21.4	
<b>Educational level</b>	No formal education	36	10.0	
	Basic (Primary to JHS)	85	23.6	
	Secondary	118	32.8	
	Tertiary	106	29.4	
	Post-graduate degree	15	4.2	
<b>Occupation</b>	Government employee	85	23.6	
	Self-employee	114	31.7	
	Student	32	8.9	

Retired	59	16.4
Unemployed	70	19.4

*Source:* Field work, July 2019

**Table 4.2: Assessment of respondents' level of knowledge of diabetic retinopathy**

<b>Variables</b>		<b>Frequency (N = 360)</b>	<b>Percent</b>
Patients with diabetes have an eye disease called diabetic retinopathy	Yes	149	41.4
	No	211	58.6
Early detection of diabetic retinopathy at eye clinic can save patients eyes from blindness	Yes	178	49.4
	No	182	50.6
Diabetes can cause blindness	Yes	213	59.2
	No	147	40.8
Do you know that all patients with diabetes should examined their eyes at least once every year	Yes	139	38.6
	No	221	61.4

**Source:** Field work, July 2019

#### 4.2 Relationship between level of knowledge of diabetic retinopathy and sex

Relationship between sex and level of knowledge of diabetic retinopathy showed significant association between one's sex and knowledge of D.R (p-value < 0.05). This means that the sex of a respondent could influence their knowledge of issues of diabetic retinopathy. The results also revealed that males had in depth basic knowledge on D.R compared with their female counterparts . Table 4.3 indicates the results.

**Table 4.3: Relationship between level of knowledge of diabetic retinopathy and sex**

Level of knowledge on D.R		Sex		Chi square	P-value
		Male N (%)	Female N (%)		
Patients with diabetes have eye disease called D.R	Yes	97 (59.9)	52 (26.3)	41.500	0.000
	No	65 (40.1)	146 (73.7)		
Diabetes can cause blindness	Yes	98 (60.5)	49 (24.7)	47.125	0.000
	No	64 (39.5)	149 (75.3)		
Early detection of D.R can save eyes from blindness	Yes	118 (72.8)	60 (30.3)	64.493	0.000
	No	44 (27.2)	138 (69.7)		
Do you know all patients with diabetes should examine their eyes at least once every year	Yes	94 (58.0)	45 (22.7)	46.834	0.000
	No	68 (42.0)	153 (77.3)		

**Source: Field work, July 2019 \*\* D.R = Diabetic Retinopathy**

#### **4.3: Proportion of respondents' who use eye care services**

As shown on Table 4.4, just a little over one – fifth respondents 78 (21.7%) visited the eye clinic within the last 12 months while majority 282 (78.3%) did not. Again, those who made subsequent visits to the eye clinic, four out of every five, 230 (81.6%) respondents stated they couldn't remember when they visited the clinic, while just a few, 35 (12.14%) of respondent's subsequent visitation to the eye clinic, exceeded 3 years and above. The rest of the respondents' subsequent visitation to the eye clinic, 10 (3.5%) also constituted less than 5% of the total responses obtained as indicated in the table 4.4 below;

**Table 4.4 Proportion of respondents who use eye care services**

<b>Variables</b>			<b>Frequency (N = 360)</b>	<b>Percent</b>
<b>Visitation within 12 months</b>	Yes		78	21.7
	No		282	78.3
<b>Total</b>			<b>360</b>	<b>100.0</b>
<b>Visitation that exceed 12 months</b>		2 years	10	3.5
		2 – 3 years	0	0.0
		More than 3 years and above	35	12.4
		Cannot remember	230	81.6
		Not stated	7	2.5
<b>Total</b>			<b>282</b>	<b>100.0</b>
<b>Source:</b>	<b>Fieldwork</b>		<b>July</b>	<b>2019</b>

#### 4.4 Relationship between socio- demographic characteristics and visit to the eye clinic within the past 12 months

Relationship between visitation to the eye clinic within the past 12 months and socio-demographic characteristics showed significant association between visitation to the eye clinic and sex, age, educational status and occupation, with p-values of 0.022, 0.000, 0.021 and 0.003 respectively. This means that respondents' ability to visit the eye clinic was influenced by these four most significant socio- demographic characteristics. Table 4.5 shows the results.

**Table 4.5: Relationship between socio - demographic characteristics and visit to the eye clinic within the past 12 months**

Variables	Visitation of eye clinic within the last 12 months		Chi square	P-value
	Yes N (%)	No N (%)		
<b>Sex</b>			5.238	0.022
Male	44 (56.4)	118 (41.8)		
Female	34 (43.6)	164 (58.2)		
<b>Marital status</b>			7.333	0.062
Single	18 (23.1)	34 (12.1)		
Married	28 (35.9)	137 (48.6)		
Divorced	15 (19.2)	51 (18.1)		
Widowed	17 (21.8)	60 (21.3)		
<b>Educational level</b>			11.529	0.021
No formal schooling	5 (6.4)	31 (11.0)		
Basic	13 (16.7)	72 (25.5)		
Secondary	34 (43.6)	84 (29.8)		
Tertiary	26 (33.3)	80 (28.4)		
Post-graduate degree	0 (0.0)	15 (5.3)		
<b>Age</b>			41.401	0.000
8-17	2 (2.6)	14 (5.0)		
18-27	17 (21.8)	32 (11.3)		
28-37	17 (21.8)	56 (19.9)		
38-47	13 (16.7)	37 (13.1)		
48-57	8 (10.3)	75 (26.6)		
58-67	5 (6.4)	46 (16.3)		
68-77	7 (9.0)	20 (7.1)		
78-87	9 (11.5)	2 (0.7)		

<b>Occupation</b>			16.301	0.003
Government employee	20 (25.6)	65 (23.0)		
Self-employee	30 (38.5)	84 (29.8)		
Student	13 (16.7)	19 (6.7)		
Retired	8 (10.3)	51 (18.1)		
Unemployed	7 (9.0)	63 (22.3)		

Source: Field work, July 2019

#### 4.5. Relationship between need factors / reasons for clinic visitation and sex

Relationship between need factors / reasons for clinic visitation; routine, follow -up, others and sex showed significant association with P-value of 0.000 respectively. Among the male respondents (162 ), majority, 146 (90.1%) visited the eye clinic for follow up purposes as compared with their female counterparts of 198 , with only 135 (68.5 ) citing follow -up purposes as the need / reason for the eye clinic. Similar outcome was obtained for the female respondents 60 (30.3%), citing routine purposes as the reason for their eye clinic visitation while just a few of the males 13 (8.0%) also visited the eye clinic for routine purposes. This result could be attributed the fact that, once patients with diabetes visit the eye clinic, they would be told by the eye care professionals on the need for regular follow up managements. Table 4.6 details the results.

**Table 2.6 Relationship between need factors / reasons for clinic visitation and sex**

Respondent's reasons for clinic visitation	Sex		Total N (%)	p-value
	Male N (%)	Female N (%)		
Routine	13 (8.0)	60 (30.3)	73 (20.3)	0.000
Follow up	146 (90.1)	135 (68.2)	281 (78.1)	0.000
Others	3 (1.9)	3 (1.5)	6 (1.7)	0.000
<b>Total</b>	<b>162 (100.0)</b>	<b>198 (100.0)</b>	<b>360 (100.0)</b>	

( $\chi^2 = 27.365$ ,  $df = 2$  and  $p\text{-value} = 0.000 < 0.05$ ) Source: Field work, July 2019

#### **4.6 Factors associated with utilization of eye care services**

##### **( Predisposing factors, enabling factors, need factors and utilization of eye care services)**

Table 4.7 reports the regression results on the factors associated with use of eye care services among patients who visited the endocrine clinic of Korle Bu Teaching Hospital.

**Predisposing factors:** Education and Type 2 diabetes were socio - demographic variables that were significantly associated with the use of eye care services in the past one year. Education revealed that respondents with high education had higher odds of using eye care services compared with those with no education. Type 2 diabetes (  $P=0.000$  ) was also significantly associated with utilization of eye care services because the condition predisposes a patient to the development of diabetic retinopathy, and once a patient develops DR, it would become urgent for the patient to visit the eye clinic

In addition, knowledge, which was determined by patients' level of knowledge of diabetes leading to blindness showed that, patients with knowledge of DR were 4.9 ( $p=0.050$ ) times more likely to utilize eye care services (0.012).

**Need factors:** Perceived need for eye health ( $P=0.050$ ) was significantly associated with utilization of eye care services, thus patients who experience challenges with their vision are more likely to visit the eye clinic. Early detection of DR enables the ophthalmologists to manage DR effectively and prevent it from progressing to a stage of blindness. However, findings from this study revealed that early detection of DR (0.591) was not significantly associated with utilization of eye care services.

**Enabling factors:** Accessibility to the eye clinic and staffs ( $p=0.095$ ) was not significantly associated with utilization of eye care services, because out of the study respondents, more than three-quarters had challenges accessing the eye care services. The

general implication is that if majority of the physicians at the endocrine clinic provided respondents with referral letters, they would utilize eye care services. Findings from this study showed that respondents who were provided with referral letters to visit an eye clinic were 2 times ( $p=0.024$ ) more likely to utilize eye care services ( $p=0.012$ )

Though the odds of family support (2.3498) for patients was high, it was not significantly associated with the use of eye care services ( $p=0.361$ ). However, financial support was significantly associated with the use of eye care services because out of pocket and NHIS ( $p=0.019$ ) and NHIS ( $P=0.000$ ) enabled respondents to utilize eye care services compared with respondents who had not registered with NHIS and could not afford to pay for eye care services.

**Table 4.3: Factors associated with use of eye care services**

Variable: Visit clinic past year	Odds ratio	p-value	95% Confidence Interval
<b>Predisposing factors</b>			
Sex			
Female	0.6407	0.399	0.2277 1.8026
Age categorical			
18-27	0.4763	0.634	0.0225 10.0944
28-37	0.2002	0.254	0.0126 3.2819
38-47	0.2005	0.275	0.0112 3.5973
48-57	0.0578	0.075	0.0025 1.3364
58-67	0.1359	0.21	0.006 3.0774
68-77	0.2963	0.457	0.1119 7.3346
78-87	5.9713	0.296	0.2098 169.953
Marital status			
Married	1.6018	0.587	0.2922 8.7817
Divorced	1.0053	0.996	0.137 7.3748
Widowed	2.4617	0.428	0.2648 22.8829
Knowledge of diabetic retinopathy			
Blindness due to diabetic retinopathy	3.059	0.05	0.96 9.743
Education			
Basic (Primary to JSS)	5.0963	0.166	0.6099 50.9276

Secondary school	69.6852	0.000	8.7	558.1587
Tertiary	36.7279	0.000	4.9125	274.5923
Occupation				
Self-employed	1.0655	0.927	0.2753	4.1248
Student	0.2279	0.263	0.1708	3.0401
Retired	0.9702	0.978	0.1174	8.0201
Unemployed	0.6775	0.669	0.1136	4.0412
Category of diabetes				
Type 2 diabetes	0.0164	0.000	0.1029	0.0903
Need factors				
Perceived need for eye health (vision)	0.714	0.050	0.247	2.065
Early detection of diabetic retinopathy	0.7204	0.591	0.218	2.382
Enabling factors				
Financial support				
NHIS	0.1275	0.000	0.045	0.361
Out of pocket and NHIS	6.6419	0.019	1.359	31.487
Provision of referral letters by physician	3.3499	0.024	1.172	9.576
Family support	2.3498	0.361	0.376	14.691
Access to eye clinic and staffs	0.3943	0.095	0.132	1.177

Utilization of eye care services

Eye examination	0.0377	0.012	0.003	0.492
Constants	38.9078	0.135	0.3204	4724.59

#### 4.7. Self-reported reasons for not visiting the eye clinic

A little over two thirds of the respondents (41.1%), felt it was not necessary to visit the eye clinic while 28.9% of them also had good vision. Only a few respondents had financial constraints (13.8%), long waiting time (10.5%) and poor attitude of staffs (5.8%) as a hindrance to the use of the eye clinic. Table 4.8 shows the results.

**Table 4. 4: Self-reported reasons for not visiting the eye clinic**

Reasons for not visiting the eye clinic	Responses	
	N	Percent
I felt it was not necessary	334	41.1
My vision is good	235	28.9
Poor attitude of staffs	47	5.8
Long waiting time	85	10.5
Financial constraints	112	13.8
<b>Total</b>	<b>813</b>	<b>100.0</b>

**Source: Field work, July 2019 \*\*\* Results are not mutually exclusive \*\*\*\***

#### 4.8 Summary of chapter four

This chapter presents the analysis of the major findings from the study. The results were presented in sections: Predisposing factors (socio demographic characteristics of respondents and assessment of knowledge of diabetic retinopathy), relationship between level of knowledge of diabetic retinopathy and sex, proportion of respondents who use eye care services, relationship between socio demographic characteristics and visit to the eye clinic within 12 months, relationship between need factors / reasons for clinic visitation and sex, factors associated with utilization of eye care services and self-reported reasons for not visiting the eye clinic.

## CHAPTER FIVE

### DISCUSSION

#### 5.0 Introduction

This chapter presents the findings of this study in relation to the reviewed literature. In order to address the objectives of this study, the discussions are presented in sections.

Section one presents the utilization of eye care services in the past one year. Section two presents knowledge of diabetic retinopathy while section three also presents factors associated with the use of eye care services. Section four elaborates on self-reported reasons for not visiting the eye clinic.

#### 5.1 Utilization of eye care services in the past one year.

In this study, the mean age of respondents was 45 years. More than half (55.0%) were females with the rest constituting the male population. Utilization of eye care services among respondents was poor. It is essential for all patients with diabetes to visit the eye clinic for routine annual eye screening. This is because regular eye screening offer the ophthalmologists and the other staffs the opportunity to detect the signs of diabetic retinopathy early enough, since it is asymptomatic, so that appropriate treatment modalities can be instituted to safe the eyes from blindness. This study revealed that, only 21.7% of respondents visited the eye clinic within the last twelve months. Again, those who made subsequent visit to the eye clinic, 2 years and more than 3 years later were 3.5 % and 12.4% respectively. These results are similar to a study conducted in Malaysia, out of 2.373 patients with diabetes, only 55% had eye examination done. In addition, among patients who had undergone eye examination, only 32.8% had last examination within one year and 17.4%, more than two years ago. (Goh et al., 2006). Another study conducted for

patients with diabetes in China saw similar results because the proportion receiving recommended annual eye screening was low, as only 43.2% visited the eye clinic. (Wang et al., 2010). Whenever, a patient is diagnosed of diabetic retinopathy, in its advanced stages, not much could be done to save the eyes, that's why it is imperative for patients with diabetes to visit the eye clinic at least once a year.

It was also evidenced from this study that, majority of the respondents (78.1%) visited the eye clinic for follow-up care to continue with the management of diabetic retinopathy and not for routine eye screening. This confirms the statistics available at the eye care department of Ghana Health Service (GHS), which revealed that of the 28 million Ghanaians, 270,000 are expected to have diabetes, 93, 000 to have diabetic retinopathy and 27,000 to have vision threatening diabetic retinopathy (GHS, 2018). This suggests that majority of the patients would report to the eye clinic for follow-up management of diabetic retinopathy and not for the recommended routine eye screening services.

Another study in Ghana and Nigeria showed a prevalence of diabetic retinopathy of 17.9% (Rotimi et al. 2003). Early detection of diabetic retinopathy and provision of laser photocoagulation can reduce the risk of blindness by two-thirds among patients with diabetes (Bhavsar, 2019). It was obvious from this study that only a few respondents (21.7%) visited the eye clinic for annual eye screening, thus, majority will be diagnosed too late for diabetic retinopathy treatment to be effective. The poor utilization of the eye care services among respondents of this study could be improved by formulation and implementation of policies that would promote effective education, early screening, detection and treatment modalities for diabetic retinopathy

## **5.2 Knowledge of diabetic retinopathy**

The overall level of knowledge of diabetic retinopathy among respondent was poor. About 58.6% of the respondents had poor knowledge of diabetic retinopathy. This result implies that, most of the respondents did not know the effect of diabetic retinopathy on their vision. A study done among patients with diabetes in Tanzania reported that over two thirds of the respondents had inadequate knowledge of diabetic retinopathy (Fallatah, 2018). A similar study done among patients with diabetes in India also reported that only 4.5% had good knowledge on diabetic retinopathy (Nithin et al., 2017). In the same vein, late diagnosis of diabetic retinopathy due to delay in the use of eye care services has also been linked to poor patients' knowledge (Lartyel, 1997). This is consistent with a study conducted in Ghana, which revealed that, 19.5% had knowledge of diabetic retinopathy even though the prevalence of diabetic retinopathy was 49% (Akpalo, 2013).

In contrast, a study done in South Arabia among patients with diabetes reported that 92.4% of the respondents had adequate knowledge of diabetic retinopathy. However, only 10.5% of the respondents had knowledge of the need for routine eye examinations at the eye clinic (Fallatah et al., 2018). Findings from this study showed that, only 38.6% of the respondents had knowledge of the need to visit the eye clinic for eye screening at least once every year. Diabetic retinopathy is one of the common complications among patients living with diabetes that could cause irreversible blindness. Lack of adherence to eye screening guidelines and prompt referral of cases of diabetic retinopathy could lead to a higher incidence of blindness. Thus, lack of knowledge of diabetic retinopathy among patients with diabetes would be blamed for the delays in the use of eye care services (Agudu et al., 2011). It is therefore imperative to ensure appropriate eye care seeking behavior, in order to decrease the complications from diabetic retinopathy and improve the quality of life for people living with diabetes.

### **5.3 Factors associated with the utilization of eye care services**

Predisposing factors like education, and knowledge of the need for annual eye screening revealed that respondents utilized the eye clinic. Findings from this study showed that, respondents with high education had higher odds of using eye care services and those with knowledge of diabetic retinopathy were also 2.7 ( $p=0.077$ ) times more likely to utilize the eye clinic. A similar study done in China reported that, low proportion of patients with diabetes, utilizing eye clinic was associated with inadequate knowledge of diabetic retinopathy (Wang et al, 2010). There was a significant association between visitation of eye clinic and sex ( $p=0.022$ ), which was supported by a study conducted in Tehran, where, it was more likely for women to seek eye care services than men (Foutouhi et al., 2006)

Need and enabling factors were also associated with the use of eye care services because respondents who were recommended by physician to visit an eye clinic were 2.2 times ( $p=0.089$ ) more likely to utilize eye care services. Findings from this study also revealed that, 78.3% of the respondents did not receive referral letters from physicians in order to visit the eye clinic. This is consistent with a study done among patients with diabetes, which reported that 50.5% of the respondents did not receive referral letters or were not told by their physicians to visit the eye clinic (Adriano et al., 2011). A similar study also showed that recommendation of regular eye screening by the provider ( $p=0.11$ ) was significantly associated with the use of eye care services (Murthy et al, 2012).

There are primarily three factors namely, availability, affordability and accessibility of eye care centres that could enhance the utilization of eye care services (Kaufman et. al.,2012). More than three-quarters of the respondents had challenges associated with their use of eye care services. About 79.2% of the respondents did not know the location of the eye

clinic and 76.1% couldn't also access the eye clinic from the endocrine clinic. Out of pocket and NHIS ( $p=0.031$ ) and NHIS (0.000) were significantly associated with the use of eye care services. Financial status of the patients with diabetes influenced their ability to visit the eye clinic. Cost effectiveness of strategies for diabetic retinopathy screening could save 62 years of patients eyes from blindness (Dabash et al, 1991).

Majority of the respondents, 65.5%, had to finance their eye care services out of their own income, because diabetic retinopathy treatment modalities were not covered by the national health insurance scheme in Ghana. In Tanzania, a similar study reported that 35.3% of patients with diabetes didn't visit the eye clinic for recommended annual eye screening due to financial constraints. (Mtuya et al., 2016). Research showed that, primarily, three factors namely; availability, accessibility and affordability facilitate or impede the use of eye care services (Ntoso & Oa, 2010). However, findings from this study revealed that, poor utilization of eye care services was due to accessibility and affordability because, 78.3% of the respondent couldn't access the eye care services and 65.6% had to finance their eye care services from out of their own income

#### **54. Self-reported reasons for not visiting the eye clinic.**

Patients- level of self-reported reasons affect their compliance with annual eye screening services at the eye clinic. This study revealed that majority of the respondents, 41.1% cited "I felt it was not necessary" as a reason for not visiting the eye clinic. The second reason was "my vision is good" (28.9%). Respondents also cited "financial constraints" (13.8%) as the third reason. This was followed by longer waiting time (10.5%) and poor attitude of staff (5.8%). A similar study in South India showed, 50.5% of the respondent cited "my eyes were okay at the time" while 38.6% also cited financial cost as the reason for the follow-up delay at the eye clinic (Natarajan et al., 2017). These results are consistent with

a study done in Tanzania where 35.5% of the respondents identified financial cost as the reason for not visiting the eye clinics (Mtuya et al., 2016).

### **5.5 Summary of chapter five**

Chapter five presents the findings of this study in relation to the literature reviewed and it is presented into four sections: utilization of eye care services in the past one year, knowledge of diabetic retinopathy, factors associated with utilization of eye care services and self-reported reasons for not visiting the eye clinic. The next chapter provides summary, conclusion, and recommendations of the study.

## CHAPTER SIX

### SUMMARY CONCLUSIONS AND RECOMMENDATION

#### 6.0 Introduction

Chapter six clearly summarizes the overall findings of the study and presents the following sections : summary of the study, conclusion of the study, contribution of knowledge, recommendations, limitation of the study and future research.

#### 6.1 Summary of the study

The general objective for the study was to determine factors associated with utilization of eye care services among patients with diabetes attending the endocrine clinic of KBTH.

In order to achieve the objective of this research, a descriptive cross – sectional study was undertaken at the endocrine clinic of KBTH between May and June, 2019. Cochran sample size formula for proportion was used to obtain a sample size of 360. Simple random sampling technique was the method used for selection of respondents and questionnaire was the data collection technique. The analysis of the data was done using SPSS version 20. Chi square test and logistic regression were used to establish relationship between variables and to ascertain whether there was significant association between two or more variables respectively. The overall findings of the study in relation to the general objective, provided determinants for utilization of eye care services. Predisposing factors like education , knowledge of diabetic retinopathy and type 2 diabetes influenced utilization of eye care services. Need factors for utilization of eye care services such as routine, follow -up and others showed significant association with p- value of 0.000 respectively. Enabling factors such as accessibility, provision of referral letters by physician and financial support could facilitate or impede utilization of eye care services among patients with diabetes. Findings from this study reported that more than three -

quarters of the respondents had challenges accessing eye care services and those provided with referral letters by physicians were 2 times more likely to utilized eye care services. Financial support (out of pocket and NHIS) enabled respondents to utilized eye care services.

## **6.2 Conclusions of the study**

Utilization of eye care services among patients with diabetes in this study was poor, since majority didn't visit the eye clinic for recommended eye screening services, within the last twelve months. Findings from this study revealed that, only 21.7% of respondents visited the eye clinic within the last twelve months. A similar study conducted for patients with diabetes in China saw a similar results because only 43.2% of respondents visited the eye clinic for the recommended annual eye screening. However, there was scarce information on studies which could provide results contrary to the proportion of respondents who utilized eye care services in the past one year.

Inadequate knowledge of diabetic retinopathy was blamed for the delays in utilization of eye care services. Overall level of knowledge of diabetic retinopathy was poor. About 58.6% of the respondents had poor knowledge on diabetic retinopathy. A similar study in India reported that out of 288 respondents only 4.5% had good knowledge on diabetic retinopathy. In contrast, a study done in South Arabia reported that 92.4% of the respondents had adequate knowledge of diabetic retinopathy.

Predisposing, enabling and need factors were the determinants associated with the utilization of eye care services. Findings from this study revealed that, poor utilization of eye care services was due to accessibility and affordability. 78.3% of the respondents couldn't access the eye care services and 65.6% had to financed their eye care services

from out of their own income because diabetic retinopathy treatment modalities are not covered by the NHIS in Ghana.

It is also noteworthy that respondents had self-reported reasons like longer waiting time, poor attitude of staffs and having normal vision for not visiting the eye clinic. A respondent with these reasons would feel reluctant to visit the eye clinic.

### **6.3 Contribution to knowledge**

The study has contributed to the area of knowledge of factors associated with utilization of eye care services among patients living with diabetes in Ghana. It has also added knowledge to the health care systems, as findings could be used for policy formulation to promote effective education, early screening and detection and treatment modalities for diabetic retinopathy in Ghana. Findings of this study could assist in appraising a comprehensive eye care system for patients with diabetes in order to actualize the goal of vision 2020: The right to Sight.

### **6.4 Recommendations**

The study provides the following recommendations:

- The national health insurance scheme should include the treatment modalities of diabetic retinopathy such as laser photocoagulation and intravitreal injection of anti-vascular endothelial growth factor (VEGE) agents. This would reduce the burden cost which deter most patients with diabetes from benefiting from diabetic retinopathy treatments.
- Efforts should be made by health professional who interacts with patients, to educate them on diabetic retinopathy and the need to visit the eye clinic, at least

once every year. In addition, educative posters should be pasted at vantage places where patients can easily see on their clinic days.

- Physicians should provide patients with referral letters and encourage them to visit the eye clinic for recommended annual eye screening services.
- A policy should be formulated, making it mandatory for all endocrine clinics to have access to diabetes nurse educators, who would educate patients on the management of diabetes with particular emphasis on diabetic retinopathy and the need for utilization of eye care services.

### **6.5 Limitations to the study**

Because the sample was picked from only the Korle Bu Teaching Hospital in the Greater Accra region, looking at the geographical location and eye care seeking behavior, the population findings may not be representative of all patients with diabetes in Ghana. Due to financial constraints, eye screening was not carried out to determine the proportion of respondents with diabetic retinopathy.

### **6.6 Future research**

Implication for further research would be beneficial because, there is scarce information on utilization of eye care services among patients living with diabetes in Ghana. Future research should attempt to evaluate the impact of diabetic retinopathy education strategies on utilization of eye care services.

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## **APPENDICES**

### **APPENDIX A: INFORMED CONSENT FORM**

#### **BACKGROUND**

My name is Bridgid Akrofi, a student of School of Public Health, University of Ghana, and Legon. I am undertaking a research on the topic: Utilization of Eye Care Services among patients with diabetes of Korle Bu Teaching Hospital.

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

The purpose of the study is to ascertain factors that contribute to poor utilization of Eye Care Services among patients with diabetes of Korle Bu Teaching Hospital. The study is being conducted as an academic research in partial fulfillment for the award of Master of Public Health degree.

#### **PARTICIPANTS ROLE**

The study involves administering questionnaire which requires answering some questions or having some discussion on the factors associated with the utilization of eye care services among patients with diabetes of Korle Bu Teaching Hospital. Respondents comprise both male and female patients who agree to be part of the study and give their informed consent. Selection to be part of this research is as a result of one falling within the eligibility category.

#### **COMPENSATION**

Your participation in this study will not incur any financial cost, thus you will not be paid for participating. However, 20 minutes of your time will be taken to answer the questions. As a form of appreciation, you will be given one ball pen if you agree to take part in the study. Your right to refuse to be part of this research is voluntarily and as such, you can redraw from the study at any time.

### **CONFIDENTIALITY**

All information provided during this interview will strictly be maintained confidential and only divulge on need to know basis. All information will be coded, as such your name will not be on any of our writings to make it easier for anybody to identify you by name.

### **POTENTIAL RISK /BENEFIT**

There is no direct risk to any participants in this study, although some of your time will be taken in administering the questionnaire. The outcome of the study will be beneficial to policy makers and program managers since it will serve as a reference for policy formulation.

### **DATA STORAGE AND USAGE**

Data collected from participants will be kept safe and stored under lock and key. However, at the end of the study, the findings will be shared with Korle Bu teaching Hospital and School of Public Health, University of Ghana, Legon.

**VOLUNTARY WITHDRAWAL**

Your right to refuse to be part of this study is completely voluntary and where I get to a question which you feel reluctant to answer, just draw my attention to move on or can redraw from the interview at any point. Be assured that if you choose to redraw from this study, it will not prevent you or your family members from getting access to the services offered in this facility.

**CONTACT FOR ADDITIONAL INFORMATION**

If you need further clarification, do not hesitate to contact the researcher.

Bridgid Akrofi (Student)

Mobile: 0244895632

Email: bakrofi001@st.ug.edu

**PARTICIPANTS ONLY**

I would like you to read this consent form and sign, if you are willing to participate in this study.

On my own accord, based on my understanding of what the study entails, I hereby consent to be part of this study.

Please check box if you consent to this interview.

Sign / Thumbprint.....

Date.....

Name of Researcher.....

Researcher's signature.....Date.....

**APPENDIX B: QUESTIONNAIRE**

**PART A: PREDISPOSING FACTORS**

**(SOCIO - DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS AND ASSESSMENT OF LEVEL OF KNOWLEDGE OF DIABETIC RETINOPATHY)**

Please read carefully and indicate your answers in the provided spaces

**SOCIO – DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS**

NO	Questions	Categories
1	Sex	1. Male <input type="checkbox"/> 2. Female <input type="checkbox"/>
2	Age (at last birthday )	Please state.....
3	What is your marital status?	1. Single <input type="checkbox"/> 2. Married <input type="checkbox"/> 3. Divorced <input type="checkbox"/> 4. Widowed <input type="checkbox"/>
4	Highest level of education you have completed.	1. No Formal Schooling <input type="checkbox"/> 2. Basic (Primary to JSS) <input type="checkbox"/> 3. Secondary school <input type="checkbox"/> 4. Tertiary <input type="checkbox"/> 5. Post Graduated degree <input type="checkbox"/>
5	What is your occupation?	1. Government Employee <input type="checkbox"/> 2. Self-Employee <input type="checkbox"/> 3. Student <input type="checkbox"/> 4. Retired <input type="checkbox"/> 5. Unemployed <input type="checkbox"/>
6	How do you pay for out-patient health services?	1. Out of pocket <input type="checkbox"/> 2. NHIS <input type="checkbox"/> 3. Private HIS <input type="checkbox"/> 4. Out of Pocket and NHIS <input type="checkbox"/>
7	When were you first diagnosed of diabetes mellitus?	1. Less than 6 months <input type="checkbox"/> 2. 6 months-1 year <input type="checkbox"/> 3. More than one year <input type="checkbox"/>
8	What category of diabetes do you have?	1. Type 1 diabetes <input type="checkbox"/>  2. Type 2 diabetes <input type="checkbox"/>
9	What is your current blood glucose reading	

/blood glucose reading at the last visit ? ..... mmol/L

**ASSESSMENT OF KNOWLEDGE OF DIABETIC RETINOPATHY**

- 10 Do people with diabetes have an eye disease called diabetic retinopathy? 1. Yes   
2. No
- 11 Can diabetes cause blindness? 1. Yes   
2. No
- 12 Early detection of diabetic retinopathy at the eye clinic will enable the eye specialist to save my eyes from blindness? 1. Yes   
2. No
- 13 Do you know that all patients with diabetes must have their eyes examined at least once every year? 1. Yes   
2. No

**PART B: UTILIZATION OF EYE CARE SERVICES**

- 14 Have you visited an eye clinic in the last year/12 months? 1.Yes   
2.No

- When was the last time you visited an eye clinic? If your last visit is more than one year
1. 2 years   
2. 2-3 Years   
3. More than 3 years and above   
4. Cannot remember

**PART C: NEED FACTORS**

- 15 What was your perceived need /reason for last visit? 1. Routine   
2. Follow up care   
3. Other .....

**PART D: ENABLING FACTORS ASSOCIATED WITH THE UTILIZATION OF EYE CARE SERVICES**

- 16 Have you been required by physician to visit an eye clinic for some clinical examinations? 1. Yes   
2. No
- 17 Do you know the location of the eye clinic of this facility? 1. Yes   
2. No
- 18 Is the eye clinic easily accessible from the endocrine clinic? 1. Yes   
2. No
- 19 Do you know of any other eye clinic you can visit? 1. Yes   
2. No

- 20 How far is your resident / community from .....Minutes  
the nearest eye clinic including this  
facility? By car
- 21 At your last visit, was an eye examination 1. Yes [ ]  
performed by a professional person? 2. No [ ]
- 22 Which type of eye clinic did you visit ? 1. Public [ ]  
2. Private [ ]
- 23 Which eye care professional did you see? 1.Ophthalmologist [ ]  
2.Ophthalmic Nurse [ ]  
3.Optomtrist [ ]  
4.Nonprofessional provider [ ]
- 24 Are family members willing to provide 1. Yes [ ]  
any support because of your condition? 2. No [ ]
- 25 How are you able to finance your eye care 1 Own income [ ]  
services? 2. Family and friends [ ]  
3. Borrowed money [ ]  
4 Health insurance [ ]  
5 Other (specify)..... .

**PART E: SELF-REPORTED REASONS FOR NOT VISITING THE EYE CLINIC**

- 26 What are some of your self -reported reasons 1.I felt it was not necessary [ ]  
for not visiting the eye clinic ? 2 My vision was good [ ]  
3. Poor attitude of staff [ ]  
4 Longer waiting time [ ]  
5.Financial constraint [ ]

## APPENDIX C: ETHICAL CLEARANCE

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

My Ref. No. KBTH/MA/93/19  
Your Ref. No. ....



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23<sup>rd</sup> April, 2019

BRIDGID AKROFI  
SCHOOL OF PUBLIC HEALTH  
COLLEGE OF HEALTH SCIENCES  
LEGON

**INSTITUTIONAL APPROVAL: KORLE BU TEACHING HOSPITAL-SCIENTIFIC  
AND TECHNICAL COMMITTEE/INSTITUTIONAL REVIEW BOARD (KBTH-  
STC/IRB/00001/2019**

Following approval of your study entitled "Utilization of eye care services among diabetic patients attending the endocrine clinic of Korle Bu Teaching Hospital" by the Korle Bu Teaching Hospital-Scientific and Technical Committee/Institutional Review Board.

I am pleased to inform you that institutional approval has been granted for the conduct of your study in Korle Bu Teaching Hospital.

Please contact the Head of Department to discuss the commencement date of the study.

Please note that, this institutional approval is rendered invalid if the terms of the Institutional Reviewed Board/Scientific and Technical Committee approval are violated.

Sincere regards,

Dr. Ali Samba  
Director of Medical Affairs  
For: Chief Executive Officer

Cc: The Chief Executive  
Korle Bu

**APPENDIX D: INTRODUCTORY LETTER**



**UNIVERSITY OF GHANA**  
**SCHOOL OF PUBLIC HEALTH**

Ref. No.:.....SPH/AA/2018.(12).....

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

**The Head  
Department of Medicine  
Endocrine Clinic  
Korle-Bu Teaching Hospital  
Accra**

Dear Sir/Madam,

**LETTER OF INTRODUCTION:**  
**MRS. BRIGID AKROFI (ID: 10262052)**

The above-named is a student pursuing Master of Public Health (MPH Weekend) programme for 2018/2019 academic year at the School of Public Health, College of Health Sciences, University of Ghana, Legon. As part of the requirements for completion of the programme, students are required to do project/research work.

**Mrs. Akrofi** would like to collect data for her research work titled "**Utilization of Eye Care Services among Patients Attending the Endocrine Clinic of Korle-Bu Teaching Hospital**".

I will be very grateful if you could accord her the necessary assistance for this purpose. I wish to emphasize that the data is for academic purposes only.

Thank you.

Yours faithfully,

**Prof. Augustine Ankomah  
Programme Coordinator**

**Cc: School Administrator**

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**COLLEGE OF HEALTH SCIENCES**

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