Diabetes and Depression: Cross-Sectional Study Among Patients in a Tertiary Healthcare Facility in Accra, Ghana

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LIST OF ABBREVIATIONS AND ACRONYMS

CDC – Centres for Disease Control

DM – Diabetes Mellitus

FBS – Fasting Blood Sugar

IDF – International Diabetes Federation

KBTH – Korle Bu teaching Hospital

MODY – Maturity-Onset Diabetes of the Young

NCD – Non-Communicable Disease

RBS – Random Blood Sugar

SPSS – Statistical Package for the Social Sciences

T1DM – Type 1 Diabetes Mellitus

T2DM – Type 2 Diabetes Mellitus

WHO – World Health Organisation

ABSTRACT

➢ *Introduction*

Diabetes is a significant contemporary global health crisis, impacting around 10.5% of the global population and anticipated to rise to 12.2% by 2045. The coexistence of comorbidities is common with diabetes, notably depression, which is on the rise at a faster rate compared to other mental and noncommunicable disorders. The presence of psychological distress can hinder effective treatment, potentially leading to a deterioration in both physical and mental well-being and the exacerbation of psychiatric conditions.

➢ *Aim*

This study aimed to investigate the prevalence of depression among diabetic patients visiting the Korle Bu Teaching Hospital and to determine the knowledge and coping strategies of depression by diabetics.

➢ *Method*

The study was conducted at the Diabetic Clinic of the Korle Bu Teaching Hospital. Convenient Sampling Technique was used. Selection criteria included patients who had been diagnosed with diabetes for at least one year, 18 years and over, patients without other major co morbidities. Questionnaire administered for demographic information, depression severity and coping strategies.

➢ *Results*

The prevalence of depression among diabetic patients was found to be 21%, similar to other studies but lower than rates recorded in other studies. Over 50% of participants had adequate Knowledge of depression in diabetes. Ninety-six percent of participants were found to utilize approach methods to coping. This was attributed to higher levels of education and their possession of adequate knowledge concerning diabetes mellitus.

➢ *Conclusion*

The study findings shows that cultural and environmental factors contribute to variations in depression prevalence and coping mechanisms. Thus, healthcare providers must personalize depression interventions and coping strategies to match each patient's needs. Comprehensive education by clinic staff is also strongly recommended.

CHAPTER ONE
INTRODUCTION

According to the International Diabetes Federation "diabetes is one of the largest global health emergencies of the 21st century". Diabetes is spiralling out of control and about 1 in 10 adults are living with diabetes. Almost half are undiagnosed (*IDF Diabetes Atlas | Tenth Edition*, 2023). One of the major global health events with the fastest rate of growth in the 21st century is diabetes, which, according to their 2021 report, currently affects 10.5 percent of the world's population and is projected to reach 12.2 percent by the year 2045. Additionally, population aging and population growth have increased the number of diabetes cases globally (Zhou et al., 2016). Ghana and the rest of sub-Saharan Africa are expected to have among of the highest rates of diabetes globally (Carracher et al., 2018).

Depression is a type of mood disease that leaves sufferers feeling down and gloomy all the time. All depressive disorders are characterized by feelings of melancholy, emptiness, or irritability as well as physical and cognitive changes that significantly impair the individual's capacity to function (Chand & Arif, 2022a). A variety of risk factors for depression, a prevalent and frequently recurrent illness, have been identified in the literature. Comorbid conditions with other mental illnesses, a family history of depression and mental illness, traumatic childhood experiences, prior histories of depression, the treatment of depression and its results, physical inactivity, female gender, younger adults, smoking, and having a chronic illness are a few of these (M. Li et al., 2016; Meng & D'Arcy, 2014; van der Veen et al., 2015; Weissman et al., 2016).

Numerous systemic disorders, both chronic and non-chronic, like diabetes, rheumatoid arthritis, and cancers, are frequently thought to be linked to depression (Ding et al., 2022). Type 2 diabetes (T2DM) and depression often coexist (Zhu et al., 2022). Diabetes and depression are becoming more common than other mental and noncommunicable diseases, but at a faster rate (Sartorius, 2018). Some researchers claim that because of the psychological trauma associated with receiving a diabetes diagnosis and the burdens of the condition itself, like managing the condition itself or both together because they present significant challenges for clinical practice, diabetes precedes depression and increases the risk of developing it (Engum, 2007).

It is widely accepted that psychological discomfort might make it more difficult for an individual to get the necessary therapy, which can complicate managing their diabetes (Co et al., 2015). If the obstacle is not addressed, there may be a deterioration in mental and physical health as well as the emergence of psychiatric disorders, which could make it more difficult to manage diabetes and interfere with self-care routines (Amankwah-Poku et al., 2020).

A. Relevance of Study

A significant public health problem is the prevalence of diabetes and depression concurrently. According to earlier research, diabetes patients are more prone to experience depression, which can worsen glycaemic control, increase the risk of complications, and lower quality of life. In order to recognize and address this problem, it is essential to comprehend the incidence of depression among diabetics. An excellent location to look into the prevalence of depression among diabetics is the diabetes clinic at Korle-bu Teaching Hospital in Ghana, which provides care to a sizable and diverse population. This study can shed important light on the prevalence of depression in this patient population and provide guidance for interventions that might enhance patient outcomes. This study can gather information on the prevalence of depression among diabetic patients by surveying patients in the diabetic clinic.

B. Problem Statement

Diabetes and depression are both chronic clinical conditions which greatly weigh down on the health and wellbeing of the patient. When diabetes is found coexisting with depression, health outcomes are predictably adverse (Akpalu et al., 2018). Along with the proven bi-directional association between diabetes and depression, which means that people with depression have a higher risk of getting diabetes and vice versa, depression can significantly hinder people with diabetes from handling their own treatment. This has the potential to seriously impede the treatment of diabetes, especially when it comes to exercise, dietary changes, and diabetic drugs. Once more, Ghanaian medical facilities focus primarily on treating diabetes medically, leaving aside psychological treatment to some extent (Amankwah-Poku et al., 2020).

C. Research Questions

Depression is a common comorbidity among diabetic patients, and can have significant negative effects on patients' quality of life and health outcomes. To investigate this topic, several research questions can be formulated.

- What is the prevalence of depression among diabetic patients visiting the Diabetic Clinic at the Korle Bu Teaching Hospital?
- What is the level of knowledge of depression among diabetic patients presenting to the Diabetic Clinic at the Korle Bu Teaching Hospital?

- What are the coping strategies used by diabetic patients with depression at the Korle Bu Teaching Hospital?
- What are the coping strategies used by diabetic patients without depression at the Korle Bu Teaching Hospital?
- How does severity of depression affect level of coping strategy?

D. Aim

The study aims to investigate depression among diabetic patients visiting the Diabetic Clinic at the Korle Bu Teaching Hospital.

E. Objectives

- To determine the prevalence of Depression among Diabetic Patients visiting the Diabetic Clinic at the Korle Bu Teaching Hospital.
- To determine the knowledge of depression among diabetic patients presenting to the diabetic clinic
- To determine the levels of coping strategies among diabetic patients with and without depression

F. Hypothesis

A null hypothesis and alternate hypothesis were drawn to determine if there is an association between the depression levels and type of coping mechanism

- Null hypothesis: Level of depression has no effect on the type of coping mechanism adopted bt patient.
- Alternative hypothesis: the level of depression has an effect on the type of copying mechanism adopted by patient.

CHAPTER TWO
LITERATURE REVIEW

A. Diabetes

Diabetes Mellitus is a physiologically abnormal state represented by persistently increased blood glucose levels, hyperglycaemia. Diabetes mellitus (DM) is generally known as diabetes (Banday et al., 2020). The chronic and varied manifestations of hyperglycaemia are due to the abnormalities in the metabolism of carbohydrates, fats, and proteins. Hyperglycaemia is caused by these abnormalities in either insulin secretion or insulin action, or both. Diabetes presents in a variety of different patterns and progresses in a complex manner with a complex pathophysiology ("Diagnosis and Classification of Diabetes Mellitus," 2014). Generally, in DM, blood glucose levels are not carefully regulated. Type 1 Diabetes (T1DM), type 2 diabetes (T2DM), maturity- onset diabetes of the young (MODY), gestational diabetes, neonatal diabetes, and steroid-induced diabetes are only a few of its many subclassifications. The two primary types of diabetes mellitus are type 1 and type 2, each with a unique aetiology, presentation, and care, but all with the ability to cause hyperglycaemia (Sapra & Bhandari, 2022).

An autoimmune process often results in the destruction of beta cells in the pancreas in patients with type 1 diabetes. Because beta cells are eliminated entirely, the body produces either very little or no insulin. A more subtle manifestation of type 2 diabetes is an insulin functional deficit resulting from an imbalance between insulin sensitivity and levels. The diminished insulin response in type 2 diabetes is referred to as insulin resistance. During this state, there is an increase in insulin synthesis to maintain glucose homeostasis. But as time goes on, this decreased insulin production results in type 2 diabetes (T2DM) (Regina et al., 2022).

While there are a number of causes of insulin resistance, the two most prevalent ones are aging and obesity (Sapra & Bhandari, 2022). While T1DM is expected to emerge in children or teenagers, T2DM is thought to affect middle-aged and older people with chronic hyperglycemia as a result of poor lifestyle and nutritional choices (Yakaryılmaz & Öztürk, 2017).

According to recent estimates, the prevalence of diabetes has considerably increased, with over 422 million people globally aged 18 and older believed to have the condition, and an estimated 1.5 million people die from it annually (Asamoah-Boaheng et al., 2019). In 2021, there will be 24 million people (20–79) with diabetes in the IDF Africa Region. This figure is expected to increase to 33 million by 2030 and 55 million by 2045, respectively (Diabetes in Africa, 2021).

With recent figures ranging from 6.2 percent to 13.9 percent and older research revealing a meagre prevalence rate of less than 0.02 percent of the adult population, trends in the prevalence of diabetes in Ghana are similar to those seen in other sub-Saharan African nations (Asamoah-Boaheng et al., 2019). It is anticipated that the sub-Saharan African region, which includes Ghana, will have one of the highest incidences of diabetes worldwide (Carracher et al., 2018). Five to ten percent 5–10% of cases of diabetes mellitus (DM) is accounted for by type 1 diabetes mellitus (T1DM). Globally, 1 in 11 adults has DM with 90% having T2DM (Sapra & Bhandari, 2022).

Untreated type 2 diabetes results in persistently elevated blood sugar levels (*Type 2 Diabetes: Overview*, 2020). Type 2 diabetes is more likely to occur in people who are overweight and do not exercise enough, smoke, consume a diet rich in fat, sugar, and low in fibre, use certain medications that alter how the body processes sugar, and have genetic predispositions. Some families have higher rates of type 2 diabetes (Ley et al., 2018). People with type 2 diabetes are more likely to experience the following health issues: disorders of the heart and blood vessels, injury to the kidneys, nerves, and eyes Treatment for type 2 diabetes seeks to maintain quality of life and prevent or delay complications. This calls for regular follow-up, control of blood sugar and cardiovascular risk factors, and—above all—a patient-centered approach to boost patients' engagement in self-care activities (Davies et al., 2018)., diabetic foot, as well as changes in way of lifestyle (*Type 2 Diabetes: Overview*, 2020).

B. Depression

Depression is a type of mood disorder that leaves sufferers feeling down and gloomy all the time. The Diagnostic Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) published by the American Psychiatric Association categorizes depressive disorders into five groups: major depressive disorder, dysthymia (persistent depressive disorder), premenstrual dysphoric disorder, disruptive mood dysregulation disorder, and depressive disorder related to another medical condition (Chand & Arif, 2022b).

In addition to physical and cognitive changes that significantly impair a person's capacity for functioning, all depressive disorders are characterized by feelings of melancholy, emptiness, or irritability (Ormel et al., 2019). A multitude of genetic and environmental variables are involved in the complex aetiology of major depressive disorder. Although those without a history of depression can also experience depression, those who have a first-degree relative who has experienced depression are around three times more likely to experience depression than the general population (Pham & Gardier, 2019).

A variety of risk factors for depression, a prevalent and frequently recurrent illness, have been identified in the literature. Comorbid conditions with other mental illnesses, a family history of depression and mental illness, traumatic childhood experiences, prior histories of depression, the treatment of depression and its results, physical inactivity, female gender, younger adults, smoking, and having a chronic illness are a few of these (M. Li et al., 2016; Meng & D'Arcy, 2014; van der Veen et al., 2015; Weissman et al., 2016).

Depression is a mood disorder that causes a persistent feeling of sadness and loss of interest (Suma et al, 2022). The Diagnostic Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) of the American Psychiatric Association classifies depressive disorders under the following headings: disruptive mood dysregulation disorder, major depressive disorder, persistent depressive disorder (dysthymia), premenstrual dysphoric disorder, and depressive disorder due to another medical condition. The traits of melancholy, emptiness, or irritation, along with physical and cognitive changes that significantly impair a person's capacity to operate, are shared by all depressive diseases (Chand et al., 2021).

There are numerous causes of major depressive disease, including environmental and genetic factors. While individuals without a family history of depression may experience depression, those who are first-degree relatives of depressed individuals are around three times more likely to experience depression than the general population (Pham et al, 2019).

The fundamental pathophysiology of serious depressive disease is not well understood. According to current study, the complex interplay between neurotransmitter availability, receptor modification, and sensitivity is assumed to be the origin of the emotional symptoms (Suma et al, 2022).

C. Relationship Between Diabetes and Depression

Patients with chronic conditions may experience negative emotions like sadness. Scholars have conducted several theoretical or empirical studies on the psychological state of patients with chronic conditions. It is estimated that between 9.3 and 25% of people with chronic diseases experience depression (Ingle et al., 2017). Numerous people with chronic diseases also have mental problems, such as depression, as a result of the nature of chronic illness and its consequences on quality of life, according to a study (Mansoor et al., 2018). Patients with chronic diseases frequently have long-term pain and physical dysfunction, which reduces their quality of life and restricts their ability to adjust to new social and occupational situations. As a result, such people get depressed, feel worthless in the face of life, and deny their own worth (dos Santos et al., 2017). There have been studies of increased incidence of depression in patients with diseases like cancer, heart disease, diabetes, stroke, and respiratory issues than in the general population worldwide (H. Li et al., 2019).

Depression is twice as common in diabetics as in the general population, and it is connected with negative outcomes (Moulton et al., 2015). Although the psychological impacts of diabetes may exacerbate depression, this reason does not entirely explain how these two diseases are linked. According to Holt, these disorders may be caused by the same biological and behavioral mechanisms, such as inflammation, hypothalamic-pituitary-adrenal axis stimulation, sleep disturbances, sedentary lifestyles, poor eating habits, environmental risk factors, and cultural factors (Holt et al. 2014).

Das-Munshi et al. discovered that the prevalence of any mental disorder was 21.6 percent in the diabetes group and 16.3 percent in the non-diabetic group in a cross-sectional population-based study. However, the odds ratio was again adjusted and determined the difference to be non-significant, after controlling for age, gender, disability in daily functioning, and medical comorbidity (Das-Munshi et al., 2007). However, other studies found a significant difference in prevalence among diabetics and non-diabetic patients (EH et al., 2008; Fisher et al., 2008). Numerous factors, including diabetes type, research design (controlled vs. uncontrolled), sample size, categorization of depression, and depression assessment techniques, affect estimates of the prevalence of depression (standardized interviews vs. self-report questionnaires) (Andreoulakis et al., 2012). Depression is identified at a rate that is around 2-3 times higher when specific cut-offs in self-report questionnaires are utilized than when major depression is evaluated with standardized interviews. This relates to bias in assessment methodology, specifically (Andreoulakis et al., 2012).

Undiagnosed depression in primary care is becoming a big problem because of the aging population's rise and the burden of chronic disease that goes along with it (Craven & Bland, 2013). Depression education is also necessary for patients with chronic illnesses so that they can detect it in themselves; professionals should not be the only ones with this information (H. Li et al., 2019)

D. Coping Mechanism of People with Diabetes

People with chronic diseases are more likely to experience depression, which severely lowers their general state of health (Craven & Bland, 2013). People use coping, which is thought to be a complicated process, to deal with a variety of stressful events that are challenging and frequently surpass the person's resources (Bianca et al., 2022). There are two types of coping mechanisms: adaptive/approach (meaning the person attempts to lessen the stress) and maladaptive/avoidant (described by a situation in which the individual keeps or even amplifies the current symptomatology) (Albai et al., 2017). It has been shown that coping may affect a person's

bodily response, resulting in a normal or pathological response in humans, a process that depends on its effectiveness in easing the psychological discomfort (Habra et al., 2003). In other chronic conditions, it has previously been shown that various coping strategies are linked to either an improved or worse prognosis (Albai et al., 2017).

Learning to cope with diabetes entails learning how to control both the disease's physical symptoms and the associated mental stress. Modifying one's lifestyle, receiving emotional support, and managing one's medication can all be coping techniques for those with diabetes (Collins et al., 2009). Making lifestyle modifications can greatly improve diabetes control and lower the risk of complications, according to a 2016 study (L. Li et al., 2016). Additionally, modifying one's way of life can enhance general mental health and wellbeing, which is crucial for those who have diabetes because they may suffer higher levels of stress and anxiety (Kalra et al., 2018). Depression symptoms have also been shown to worsen when self-care routines are not followed by people with diabetes who are already suffering depressive symptoms (Gonzalez et al, 2008). This raises the possibility that lower self-care behavior compliance and depressive symptoms are connected, In a mutually beneficial approach. Diabetes requires a multimodal treatment strategy that includes dietary changes, psychosocial support, and medication control. People with diabetes can improve their quality of life and reduce their risk of complications by putting these coping skills to use.

CHAPTER THREE
METHODOLOGY

A. Study Design

A cross-sectional study was carried out among patients the Diabetic Clinic of the Korle Bu Teaching Hospital.

B. Study Site

The study was carried out at Korle-bu Teaching Hospital's diabetic clinic. The largest hospital in Ghana, KBTH serves as the primary tertiary referral facility for the southern region of the nation. It was founded in 1923 and is situated in Ghana's capital city of Accra, in Korle-Bu. Three Centers of Excellence, 21 clinical and diagnostic departments, and 2,000 beds constitute the hospital.

The Endocrinology Unit, a division of the Department of Medicine and Therapeutics, is in charge of the Diabetic Clinic. The Korle-Bu Teaching Hospital's medicine and therapeutics department, which provides medical and consulting services, is staffed by physician specialists. It also conducts research and provides training. The department employs 522 people and can accommodate 277 beds.

C. Study Population

Patients with diabetes who visited the Diabetic Clinic at the Korle Bu Teaching Hospital were the research's study population. Millions of individuals worldwide suffer from diabetes, a chronic metabolic illness that is a major public health concern in many nations, including Ghana. The largest teaching hospital in Ghana is the Korle Bu Teaching Hospital, a tertiary healthcare center situated in Accra. Patients with diabetes can receive thorough care in the hospital's dedicated diabetic clinic. The demographic of interest is those who sought care at Korle Bu Teaching Hospital's diabetic unit during the study period. They see between thirty and sixty patients a day on average.

D. Selection Criteria

➢ Inclusion Criteria
Patients in Korle-Bu Teaching Hospital who were:

- Seeking care at the Diabetic Unit
- Diagnosed with diabetes for at least one year
- 18 years and over

➢ Exclusion Criteria

- Patients who did not consent to partake in the study.
- Patients who had other major co morbidities (e.g., end stage renal disease, chronic pain)
- Patients with a traumatic event in the last 8 months. (Death of a loved one, tragic accident, death of a loved one)
- Patients not of sound mind

E. Sample Size

$N = [Z^2 (P) (1-P)] / D^2$ (Cochran's Formula) N = sample size
Z = standard statistic for a level of confidence of 95% (1.96)
P = estimated prevalence of depressed people with chronic illness 9.3-25% (Ingle et al., 2017). Therefore 17.15%
D = acceptable margin of error for the study (0.05) Therefore,

$$N = \frac{[1.96^2 \times 0.1715 \times (1-0.1715)]}{0.05^2}$$

N = 222

However, 120 to 160 participants will be targeted due to limited time and resources available

F. Sampling Technique

A convenience sampling technique was used in selecting participants. Therefore, patients that were met at the clinic meeting selection criteria and were willing to respond were selected.

G. Data Collection

A well-structured interview-based questionnaire which is suitable to assess demographic details, diabetic details, appointment adherence, coping mechanism level and depression levels (Patient Health Questionnaire-9 (PHQ-9) was used to determine depression severity. The Brief COPE scale was incorporated into the questionnaire for the purpose of testing the coping styles. This is a shorter version of the COPE inventory of level of depression among diabetic patients. The PHQ-9 was also incorporated for screening, diagnosing, monitoring and measuring the severity of depression. Printed copies of the questionnaire were used in data collection. An Informed Consent Form was attached to the beginning of the questionnaire and was separated from the completed questionnaire after completion to ensure confidentiality.

H. Data Analysis

The data was collected and imputed into Excel. This was analysed using Microsoft Excel and IBM SPSS Statistical software version 25 to generate relevant statistical tools. The information was summarized using descriptive statistics such as graphs, tables and charts. Graphs were used to show levels of depression and coping mechanism. Interpreting depression scores was done based on table 1 below. A score of 0 through to 3 was given to each of the 9 items based on the regularity (Not at all, several days, more than half the days and nearly every day) to which they occur. The summation of the score for the tool was made and used for interpreting. Major depressive disorder (MDD) is suggested if: • Of the 9 items, 5 or more are checked as at least 'more than half the days' or • Either item 1 or 2 was checked as at least 'more than half the days'

Table 1: Guide for Interpreting PHQ-9 Scores for Depression

Score	Depression Severity 0 -
4	None-minimal
5 – 9	Mild
10 – 14	Moderate
15 – 19	Moderately severe
20 – 27	Severe

➢ *Interpretation for Coping Strategy*

Scores are presented for the two overarching coping styles:

- Avoidant Coping was characterised by the **subscales** of denial, substance use, venting, behavioural disengagement, self-distraction and self-blame.
- Approach Coping was characterised by the **subscales** of active coping, positive reframing, planning, acceptance, seeking emotional support, and seeking informational support.

Table 2: Coping Strategy Each Question Involves

Coping Strategy Subscales	Question Number
Self-Distraction (Avoidant Coping)	Cope1 + Cope19
Active Coping (Approach Coping)	Cope2 + Cope7
Denial (Avoidant Coping)	Cope3 + Cope8
Substance Use (Avoidant Coping)	Cope4 + Cope11
Use of Emotional Support (Approach Coping)	Cope5 + Cope15
Use of Instrumental Support (Approach Coping)	Cope10 + Cope23
Behavioural Disengagement (Avoidant Coping)	Cope6 + Cope16
Venting (Avoidant Coping)	Cope9 + Cope21
Positive Reframing (Approach Coping)	Cope12 + Cope17
Planning (Approach Coping)	Cope14 + Cope25
Humour*	Cope18 + Cope28
Acceptance (Approach Coping)	Cope20 + Cope24
Religion*	Cope22 + Cope27
Self-Blame (Avoidant Coping)	Cope13 + Cope26

*Humour and Religion are neither Approach or Avoidance Coping

A summation of the scores in both avoidant and approach coping strategy was done will be categorized into 4 groups; 1- none to mild coping strategy, 2 - moderate coping strategy, 3- moderately severe coping strategy, and 4- severe coping strategy. If any participants avoidants coping strategy score was greater than his approach coping strategy, it was assumed that the person on the whole had an avoidant coping strategy.

Table 3: Coping Strategy Categories

Group	Score
NONE TO MILD COPING STRATEGY	8 to 18
MODERATE COPING STRATEGY	19 to 28
MODERATELY SEVERE COPING STRATEGY	29 to 38
SEVERE COPING STRATEGY	39 to 48

Table 4: Guide for Interpreting Knowledge for Depression

Score	Depression Literacy Level
0	No Knowledge
1-3	Little knowledge
4 - 5	Average Knowledge
Above 6	Adequate Knowledge

The Chi Square test was used to determine if there is an association between level of depression and categories of coping mechanism.

I. Ethical Considerations

Before the study began, approval for the proposal was obtained from the Community Health Proposal Review Committee and clinical approval from Korle-Bu Teaching Hospital. Every study participant gave their informed consent and was free to withdraw from the study at any time. No form of coercion was used in getting participants to partake in this study. Potential risks associated with participation included discomfort or emotional distress when discussing sensitive topics related to depression and its impact on daily life. However, efforts were made to minimize these risks by providing a comfortable and private environment for participants to respond, and by offering resources for emotional support if needed. There was no direct cost incurred by participants and no compensation needed

Benefits of participation include the opportunity to contribute to the knowledge base on this topic. Participants had the option to receive a summary of the study findings upon its completion. All data was confidential with no names used but rather initials.

CHAPTER FOUR
RESULTS

A. Demography

The study involved administering a total of 120 questionnaires, and 105 individuals agreed to participate. Among the respondents, 77 individuals representing 73.3% were female, while 28 individuals (26.7%) were male. The age distribution of the respondents is presented in the histogram (Fig 1). The histogram shows the distribution of participants across different age groups. The majority of respondents, constituting 23.8% of the total, fell within the 30-39-year age group. The second most represented age group was individuals between 50-59 years, making up 22.9% of the respondents. Participants below the age of 30 accounted for 17.4% of the total. Furthermore, the age group between 40-49 years comprised 13.3% of the respondents, while the 60-69 age group represented 11.4%. The group aged 70-79 years constituted 6.7% of the participants. On the other hand, respondents aged above 80 years were the least represented in the study, with only 4.8% of the participants falling into this category.
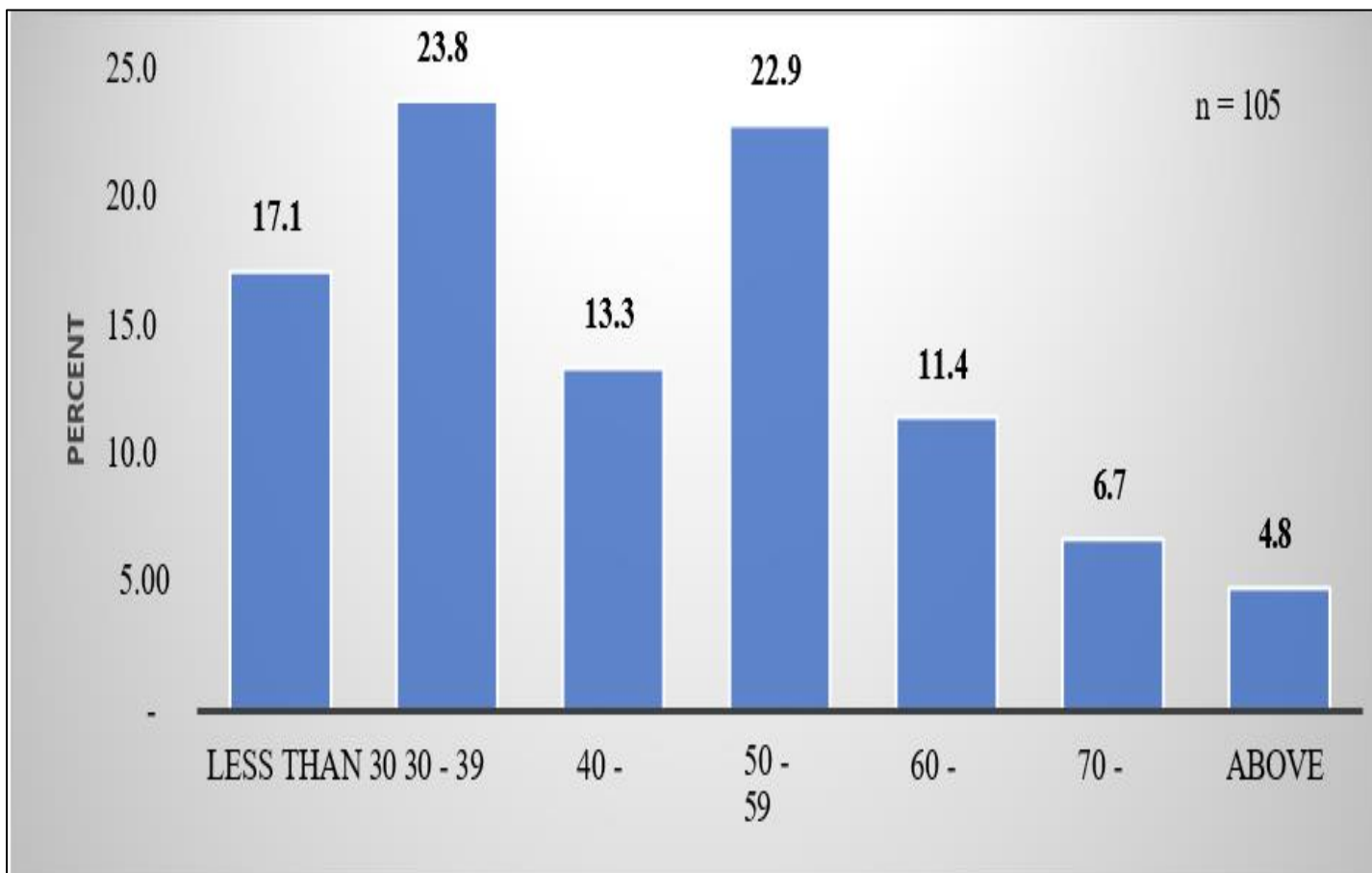

Fig 1: Age Group Distribution Among Participants

In Fig 2 below, the ethnic distribution of the sampled population is represented. The majority of the participants, constituting 51.4%, identified as Akans. Gas accounted for 21.9% of the respondents, while Ewes represented 18.1%. Smaller percentages of the sample population identified as Dagombas (3.8%), Sisalas (2.9%), Hausa (1%), and Krobos (1%). The results reveal a diverse representation of different ethnic groups among diabetic patients visiting the clinic. Akans, Gas, and Ewes constituted the largest proportion of respondents, while other ethnicities made up smaller percentages of the sample.
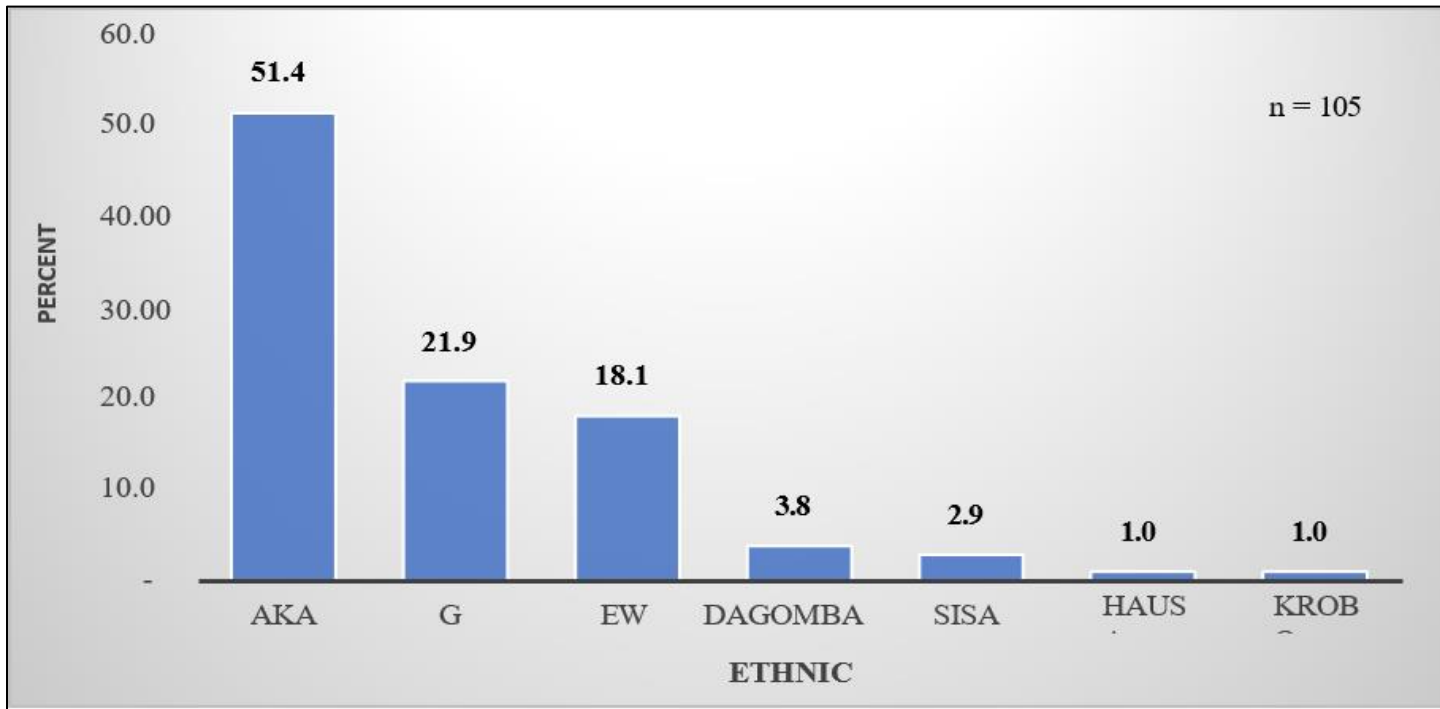
Fig 2: Ethnic Group Distribution

The pie chart (Fig 3) illustrates the educational level distribution among the 105 respondents in the study. The largest proportion of participants, comprising 38.1% of the sample, had attained tertiary education. Following closely, 33.3% of the respondents had attended secondary school. Those with their highest level of education as basic school accounted for 18.1% of the participants. Lastly, 10.5% of the respondents had no formal education.
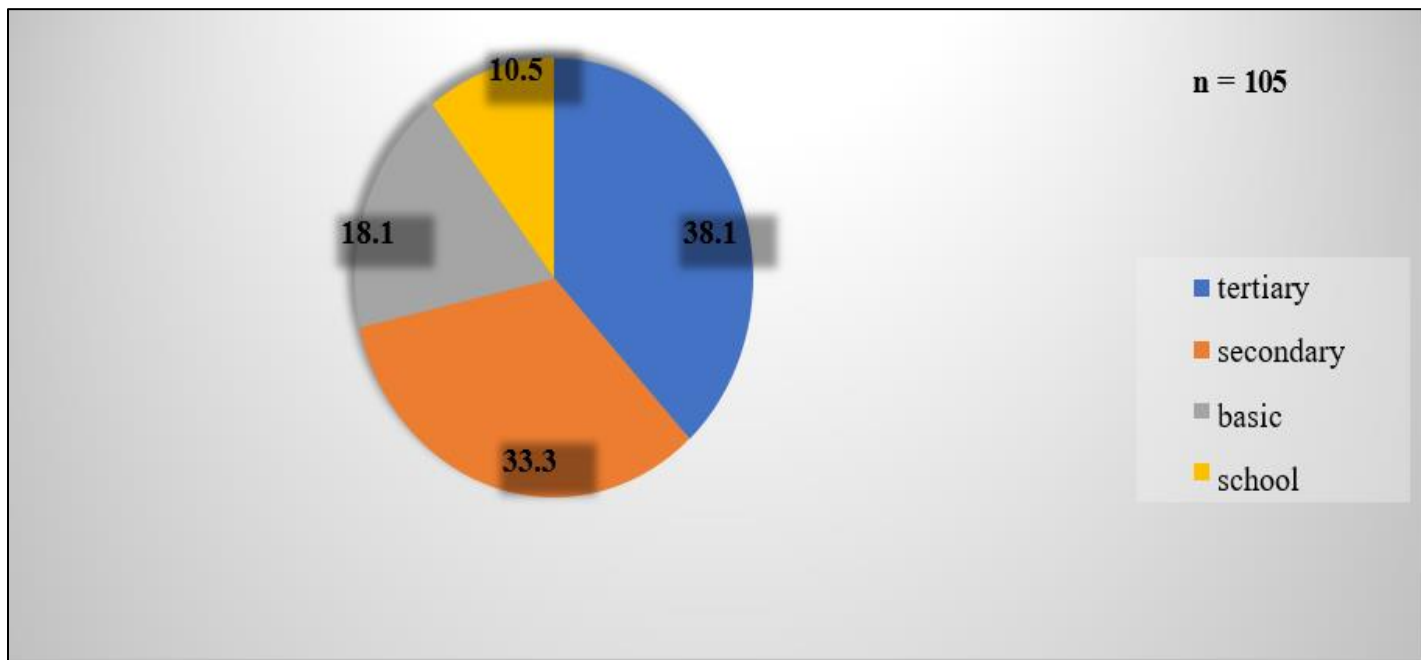

Fig 3: Educational Level Distribution

A majority of 57.1% (60 of 105) of the respondents are employed or self-employed. Christians make up 86.7% (91 of 105) and Muslims make up the remaining 13.3% (14 of 105). All respondents were Ghanaians.

B. Missing Diabetic Clinic Visit

The pie chart represents the distribution of missed diabetic clinic appointments among the 105 sampled patients. who. 58 individuals rarely miss their appointments, constituting approximately 55.2% of the sampled patients. These individuals have a strong track record of attending their scheduled diabetic clinic appointments consistently.

36 persons, making up around 34.3% of the sampled patients sometimes miss their appointments. While not as consistent as the first group, these patients still maintain a moderate level of appointment attendance. 6 individuals, equivalent to 5.7% of the sampled patients frequently missed their appointments. These patients exhibit a noticeable pattern of missing their scheduled clinic appointments.

A group of 5 individuals, accounting for about 4.8% of the sampled patients almost always miss their appointments. These patients consistently struggle to attend their scheduled diabetic clinic appointments.
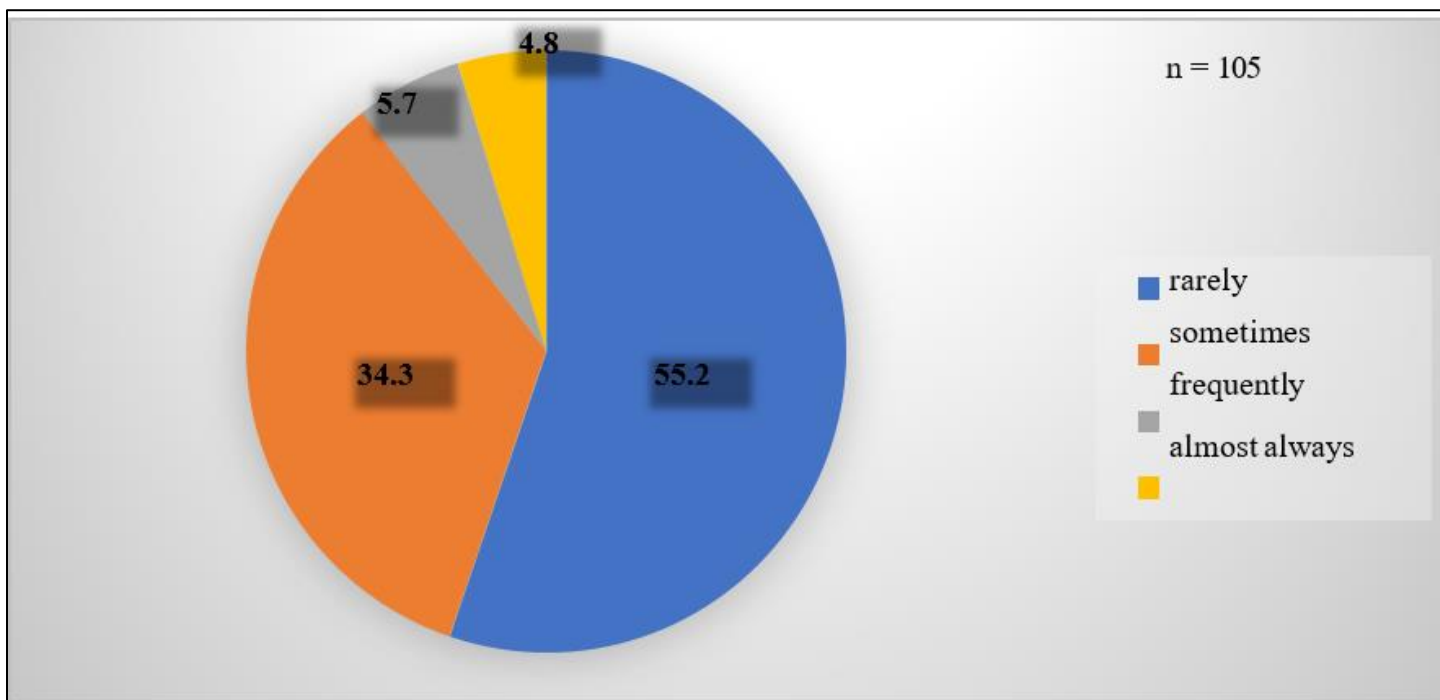

Fig 4: Regularity Of Missing Diabetic Schedule

Table 1 below presents an overview of the cross-tabulation results, examining the relationship between respondents' demographic characteristics and their attendance of review appointments.

In terms of gender, a significant proportion of females, 43 (55.8%), reported rarely missing their appointments, while 26 (33.7%) indicated occasional absences, and a minimal 3 (3.8%) reported almost always missing appointments. Similarly, among males, the majority, 15 (53.6%), rarely missed appointments, 10 (35.7%) had occasional absences, and only 1 (3.6%) frequently missed their review appointments.

When considering age groups, respondents under the age of 30 showed an equal split of 7 (38.9%) individuals each for sometimes and rare attendance, along with 2 (11.1%) respondents in both the almost always and frequent absence categories. Among those aged 30 to 29 years, a majority of 14 (56.0%) sometimes missed their appointments, while 8 (32.0%) reported rare absences. A similar trend was observed among those aged 40 to 49 years and 60 to 69 years, with the majority rarely missing their appointments, 9 (64.3%) and 9 (75.0%) respectively. Among respondents aged 50 to 59 years, 14 (58.3%) rarely missed appointments. All participants aged 70 to 79 years reported rare attendance, and among those aged 80 years or older, 4 out of 5 (80.0%) rarely missed their appointments.

On educational backgrounds, among the 40 respondents with tertiary education, 22 (55.0%) rarely missed, 12 (30.0%) sometimes missed, and 4 (10.0%) almost always missed their appointments. For those with secondary level education, 17 (48.6%) sometimes missed appointments, while 16 (45.7%) rarely missed. Among those with basic school level education, a majority of 12 (63.1%) rarely missed, and for respondents with no formal education, 8 (72.7%) reported rare absences.

Among the unemployed respondents, a majority of 22 (48.9%) rarely missed, followed by 15 (33.3%) with occasional absences, and 5 (11.1%) reporting almost always missing appointments. Conversely, among the employed participants, the majority, 36 (60.0%), rarely missed appointments, 21 (35.0%) sometimes missed, and 3 (5.0%) frequently missed their appointments.

Considering religious affiliations, Christians accounted for the majority, with 51 (56.0%) rarely missing appointments, 32 (35.1%) sometimes missed, and 5 (5.5%) almost always missing.

Among Muslims, the majority, 7 (50.0%), rarely missed, while 4 (28.6%) sometimes missed.

Across different ethnic groups, Akans had the highest number of respondents, with 27 (50.0%) rarely missing, 23 (42.6%) sometimes missing, and a minor 2 (3.7%) almost always missing their appointments. The Ga ethnic group reported 16 (69.6%) rarely missing, 6 (26.1%) sometimes missing, and 1 (4.35%) almost always missing appointments. Among Ewes, 10 (52.6%) rarely missed, and a minimal 2 (10.5%) almost always missed. Respondents from other ethnicities reported 5 (55.6%) rarely missing, 3 (33.3%) sometimes missing, and 1 (11.1%) frequently missing their review appointments.

Table 5: Regularity in Missing Diabetic Clinic Appointments Regularity in Missing Appointments (N=105)

GENDER		Almost Always	%	Frequently	%	Sometimes	%	Rarely	%	TOTAL
	Female	3	3.9	5	6.5	26	33.8	43	55.8	77
	Male	2	7.1	1	3.6	10	35.7	15	53.6	28
AGE GROUP	<30	2	11.1	2	11.1	7	38.9	7	38.9	18
	30 - 39	0	-	3	12.0	14	56.0	8	32.0	25
	40 - 49	1	7.1	0	-	4	28.6	9	64.3	14
	50 - 59	1	4.2	1	4.2	8	33.3	14	58.3	24
	60 - 69	1	8.3	0	-	2	16.7	9	75.0	12
	70 - 79	0	-	0	-	0	-	7	100.0	7
	> 80	0	-	0	-	1	20.0	4	80.0	5
EDUCATION	Tertiary	4	10.0	2	5.0	12	30.0	22	55.0	40
	Secondary	0	-	2	5.7	17	48.6	16	45.7	35
	Basic School	1	5.3	2	10.5	4	21.1	12	63.2	19
	None	0	-	0	-	3	27.3	8	72.7	11
EMPLO-	Unemployed	5	11.1	3	6.7	15	33.3	22	48.9	45
	Employed	0	-	3	5.0	21	35.0	36	60.0	60
RELIGION	Christian	5	5.5	3	3.3	32	35.2	51	56.0	91
	Islamic	0	-	3	21.4	4	28.6	7	50.0	14
ETHNIC GROUP	Akan	2	3.7	2	3.7	23	42.6	27	50.0	54
	Ga	1	4.4	0	-	6	26.1	16	69.6	23
	Ewe	2	10.5	3	15.8	4	21.1	10	52.6	19
	OTHERS	0	-	1	11.1	3	33.3	5	55.6	4

C. Coping Strategies

From the sample of 105 participants, a significant proportion was found to apply the approach method over the avoidant method. Specifically, 65 individuals, accounting for 62% of the total, achieved a cumulative score that favoured their approach parameters, categorizing them as individuals predominantly employing the approach strategy for coping. Conversely, 40 participants (38%) were classified as utilizing the avoidant coping method. This conclusion arises from their cumulative scores indicating a higher inclination towards the avoidant method compared to their approach method, placing them within the avoidant group (Table 6).

Table 6: Coping Strategy Results

Coping Strategies	Number of Participants	Proportion of Participants
APPROACH	65	62%
AVOIDANT	40	38%
TOTAL (N)	105	100%

The bar chart (Fig 5) illustrates the distribution of coping strategies among the different age groups. In the age range between 8 and 18, the chart shows that 66.7% of individuals utilize avoidant strategies, while 6.7% employ approach strategies. For the age range between 19 and 28, the proportions shift, with 26.7% adopting avoidant strategies and a significant increase to 54.3% utilizing approach strategies. As we examined the age range between 29 and 38, a smaller portion, namely 6.7%, employs avoidant strategies, while a larger segment of 28% utilizes approach strategies. Notably, for the age group between 39 and 48, a shift occurs where none employ avoidant strategies, and 11.4% exclusively adopt approach strategies. Among the age groups, the 8 to 18 range stands out as the sole category where the highest percentage of any coping strategy utilization is observed. Within this age group, the avoidant approach takes precedence, making it the group with the highest utilization of the avoidant strategy. As age advances, there is a noticeable decline in the adoption of the avoidant method, evident in the diminishing percentages among the subsequent age groups compared to the 8 to 18 range. Furthermore, across all other age groups, the approach strategy consistently takes the lead, with its utilization consistently surpassing that of the corresponding avoidant methods by more than twofold. The age range of 39 to 48 exhibits a complete absence of the avoidant strategy's use. The ages 19 to 28 showed the highest use of the approach method, followed by the age range of 29 to 38, then 39 to 48, and lastly, 8 to 18. Thus, there was a predominant preference for the approach method across all age groups, with only one exception.
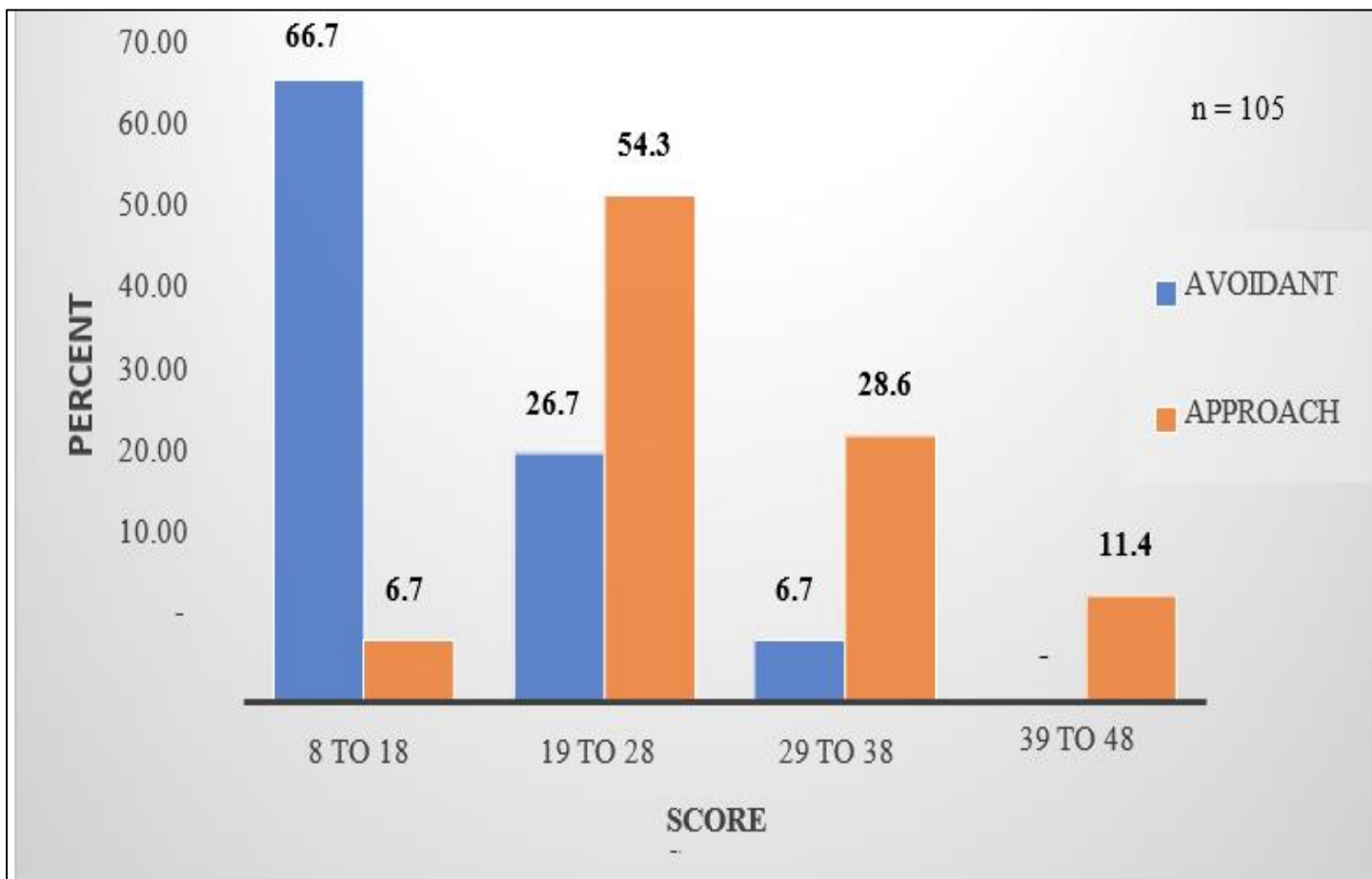

Fig 5: Distribution of Participants Across Coping Grades

D. Knowledge of Depression

A group of 9 individuals, representing 8.6% of study participants had little knowledge of depression in diabetes. 40 participants representing 38.1% of the sampled patients had an average level of knowledge about depression. Finally, 56 participants, representing 53.3% had an adequate level of knowledge about depression.
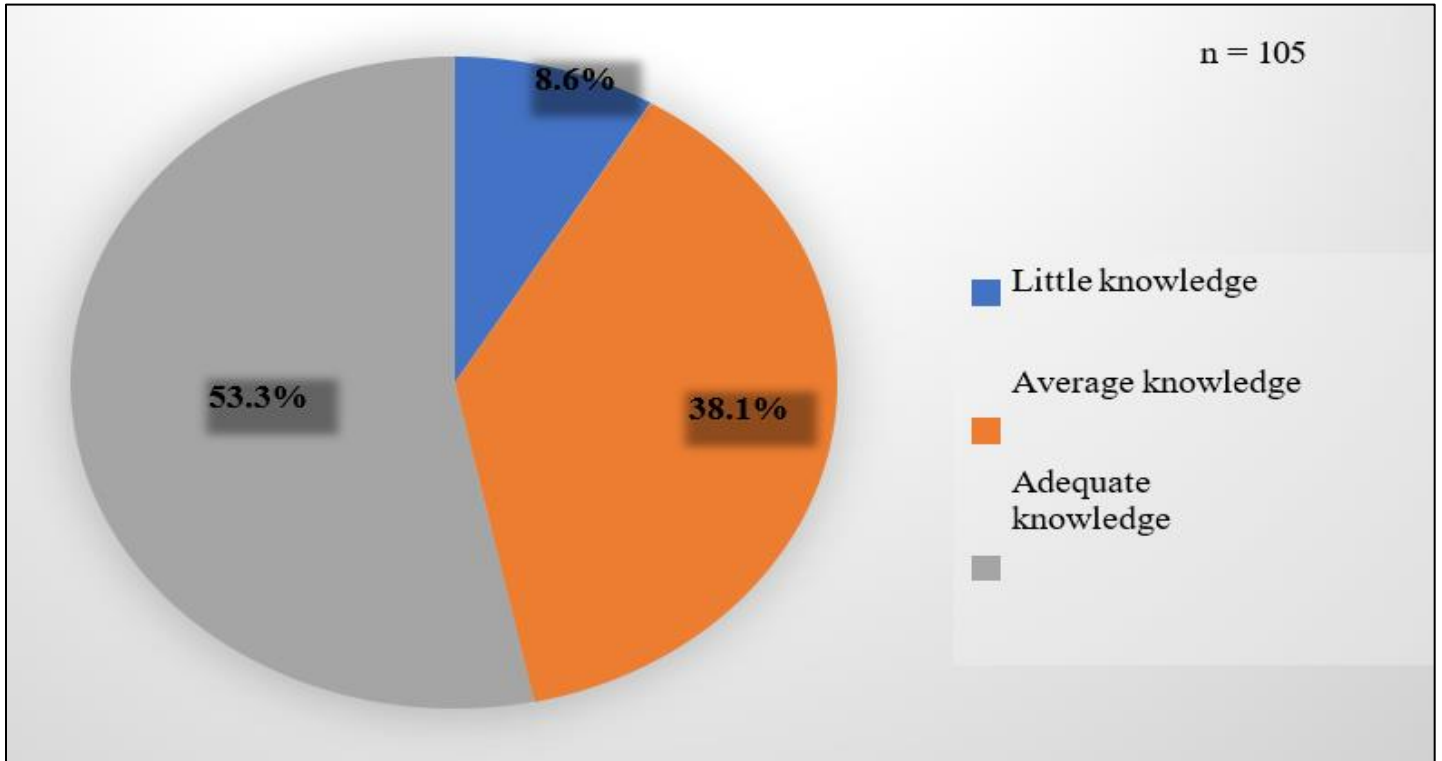
Fig 6: Literacy of Depression

E. Depression

The graph presents the severity of depression experienced by individuals within the sampled population. The segment denoting moderately severe depression represents 6.8% of the sample, with around 7 individuals. Participants with moderate depression make up 10.6% of the sample, totalling approximately 11 individuals. Those experiencing mild depression constitute 29.5% of the sample, encompassing about 31 individuals. This category signifies a significant portion of the sampled population with relatively lower levels of depressive symptoms. The participants falling within the none-to-minimally-depressed range, representing 53.3% of the sample or around 56 individuals.
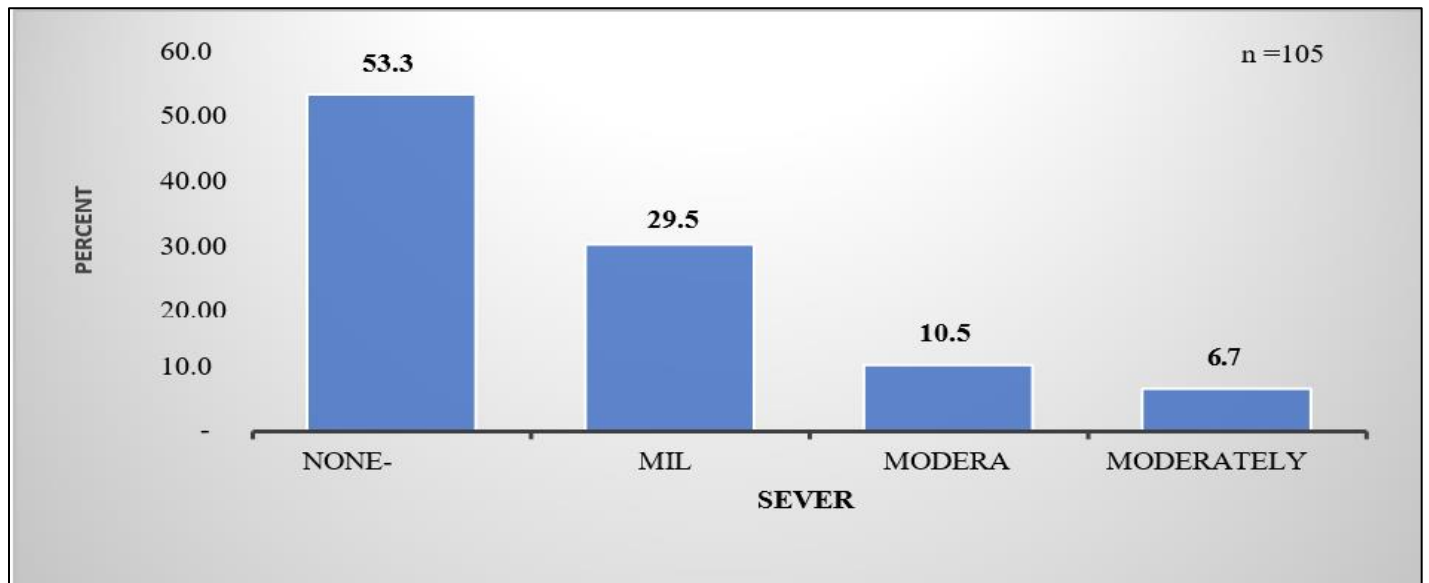

Fig 7: Depression Severity Distribution

CHAPTER FIVE
DISCUSSION

A. Prevalence of Depression among Diabetic Patients

The prevalence of depression among patients with diabetes at the Korle Bu Teaching Hospital was determined to be 21.0%, a rate that closely aligns with the findings of Das-Munshi et al. (2007), who identified a prevalence of 21.6% for any mental disorder among diabetic patients. However, a notable contrast emerges when comparing these results with the study conducted by Khan et al. (2019), in which a significantly higher prevalence rate of 87% for depression was reported among diabetic patients attending an outpatient diabetes clinic in East Tanzania. These variations in findings can be attributed to the intricate interplay of socio-economic, cultural, ethnic, and environmental factors. For instance, a related study undertaken in the capital city of Tanzania showcased a diabetes prevalence rate of 48% among patients seeking treatment at primary healthcare clinics, with a parallel rate of 55% among patients seeking care from traditional healers (Dejene et al., 2014). These disparities underscore the nuanced influence of diverse contextual elements on the prevalence of depression and diabetes within distinct populations.

According to the findings of this study, a modest portion of the participants were determined to be depressed, predominantly showcasing mild to moderate levels of depression, while a smaller number displayed moderately severe depression. It's noteworthy that the World Health Organization (WHO) has acknowledged major depressive disorder as a prevalent psychiatric condition among individuals with diabetes (WHO, 2013), making it a relevant benchmark for identification in this investigation. Echoing the findings of our study, Engidaw et al. (2020) similarly identified mild depression as the dominant presentation among diabetic patients in their research conducted at a general hospital in Ethiopia, with a minority exhibiting moderately severe symptoms. Despite the absence of patients presenting severe depression in our study, Engidaw et al. (2020) reported a minor proportion of patients experiencing severe depression in their own study. This variance in findings could stem from distinct healthcare delivery systems in the respective countries. Additionally, it's noteworthy that participants in our study displayed infrequent lapses in attending diabetic appointments, a factor that might have contributed to the observed elevation in their depressive states. This aligns with the outcomes of a meta-analysis in 2007, encompassing children, adolescents, and adults across various diabetes types, where depression's impact was most pronounced among individuals who missed medical appointments (Gonzales et al., 2008). This suggests an interplay between medical adherence and the emotional and psychological well-being of individuals with diabetes.

B. Knowledge of depression among diabetic patients

Knowledge of diabetes serves as the foundation for making informed choices about dietary habits, physical activity, weight management, blood glucose monitoring, medication usage, foot and eye care, and the management of macrovascular risk factors. The American Diabetes Association underscores the significance of this concept by instituting standards that outline the framework and procedure for diabetes educational programs (Murata et al., 2003). These guidelines encompass the assessment of patients' educational requirements, the creation of personalized teaching plans, and periodic evaluations of patient outcomes.

In assessing the knowledge of depression among diabetic patients visiting the Diabetic Clinic at the Korle Bu teaching Hospital, the participants in this study demonstrated a good knowledge of the subject matter. This finding aligns with the conclusions drawn from an Ethiopian study, which identified an appreciable level of knowledge about depression among persons with diabetes (Alemayehu et al., 2020). Alemayehu et al. further emphasized the pivotal role of higher education levels in nurturing an enhanced comprehension of diabetes mellitus. The similarity between these study's findings might reasonably be attributed to the participants' elevated educational levels.

However, this congruence stands in stark contrast to the observations presented by Murata et al. (2003) on the Diabetes Outcomes in Veterans Study (DOVES). Despite 85% of their participants having received high school education and 46% having pursued post-secondary education, a noteworthy proportion exhibited a deficit in their grasp of depression-related knowledge in diabetes. A plausible explanation for this disparity could be that patients with longstanding Type 2 diabetes confront an elevated risk for conditions such as dementia, stroke, depression, cumulative hypoglycaemic effects, and an array of coexisting health issues that impede cognitive function (Murata et al. 2003). Furthermore, their study's participants comprised American veterans, a demographic characterized by old age and potential memory lapses over time, particularly regarding information provided during the initial diagnosis of their condition. This underscores the pressing requirement for ongoing education beyond the diagnosis phase. According to Mühlhauser and Berger (2002), patients typically receive the majority of their education at the time of diagnosis, while subsequent information tends to be comparatively limited. However, the evolving nature of their condition necessitates ongoing and updated education over time. This underscores the need for continuous learning and the reinforcement of vital health information in ensuring optimal health outcomes. Thus, while patients visiting the Diabetic Clinic of the Korle Bu Teaching Hospital demonstrate adequate knowledge of depression, there remains a significant need for continuous efforts to sustain and enhance this level of understanding over time.

C. Coping strategies among diabetic patients

The primary objective of diabetes treatment is to prevent both acute and chronic complications, all the while ensuring the patient's quality of life remains intact. Coping – a psychological construct – is often discussed in the context of diabetic patients' ability to adapt to self-care routines. Coping can be defined as the continuous cognitive and behavioural endeavours aimed at handling specific external or internal demands that are perceived as straining or surpassing an individual's available resources (Lazarus & Folkman, 1984). The underlying purpose of coping mechanisms is to effectively manage a given situation or mitigate the associated anxiety. Coping strategies utilized by participants of this study included, acceptance, emotional support, use of instrumental support, positive framing, venting, and planning. Substance use, self-blaming and self-distraction were less used. It is noteworthy that whereas approach coping pertains to behavioural, cognitive or emotional activities that are directed toward a threat, avoidant coping strategies are directed away from the threat. The use of approach coping strategies generally yield positive outcomes, over avoidant coping strategies (Dubow & Rubinlicht, 2011). The utilization of approach coping strategies among diabetic patients in this study can be attributed to multiple factors. Notably, these individuals exhibit a pattern of rarely missing their diabetic clinic appointments, indicating a proactive and engaged approach to managing their condition. Additionally, their attainment of higher levels of education equips them with a deeper understanding of diabetes and empowers them to navigate its complexities effectively. Moreover, their possession of adequate knowledge concerning diabetes mellitus further reinforces their capacity for informed decision-making. Interestingly, these findings resonate with Turan et al.'s study, which revealed that coping served as a reliable predictor for outcomes, including HbA1c levels and microangiopathy, among both insulin-treated type 1 and type 2 diabetic patients (Turan et al., 2002). A significant portion of individuals aged 8 to 18 seems to favour the avoidant approach, which could be attributed to their limited experience and relative immaturity compared to the other participants.

The assessment of depression levels revealed no significant correlation with the type of coping mechanism utilized by patients. Interestingly, this contrasts with observations from individuals with diabetes in Zambia, where a prevalent utilization of avoidant coping strategies, such as self-blame and self-distraction, was predominantly observed among diabetic patients grappling with severe depressive symptoms (Hapunda, 2022). Similarly, a comprehensive systematic review undertaken in 2017 highlighted self-blame as the prevailing avoidant coping strategy among diabetic patients experiencing heightened emotional distress (Callebaut et al., 2017). These divergent findings shed light on the interplay between coping strategies and emotional well-being within the context of diabetes management.

D. Strengths

Firstly, the study maintains a clear research focus, unerringly centered on a specific and well-defined research objective - namely, the exploration of the prevalence of depression among diabetic patients at the Korle-Bu Teaching Hospital. This clarity in purpose ensures that the research remains targeted and purposeful, generating insights that directly address a pressing and significant health concern.

A further strength resides in the study's approach to sample diversity. By incorporating a broad spectrum of participants encompassing diverse ethnic groups and varied backgrounds, the study bolsters the generalizability of its findings. This inclusion of diversity lends a robustness to the research, rendering its outcomes more applicable and pertinent to a wide array of diabetic patients in Ghana.

Methodological rigor constitutes yet another formidable strength of the study. Employing structured questionnaires and meticulous assessments for both depression and coping strategies, the research demonstrates a resolute commitment to methodological precision. This rigorous approach ensures consistency in data collection, thus facilitating dependable comparisons and analyses.

Ethical considerations are evident as a strength within the study. The study – by diligently securing informed consent from participants and safeguarding their confidentiality – significantly enhances the study's credibility and underscores its adherence to responsible research practices.

A feature that amplifies the study's robustness is its use of comparative analysis. By juxtaposing its own findings with those of other studies, the research offers a compelling vantage point to discern variations in depression prevalence across distinct cultural and environmental contexts. This comparative approach enriches the scholarly discourse, contributing a nuanced perspective to the interpretation of the study's results.

The study also distinguishes itself through its pragmatic utility. Beyond the realm of data analysis, the research ventures into the realm of application by proffering practical recommendations aimed at elevating patient care. These recommendations, meticulously rooted in the study's findings, underscore their relevance and potential impact on real-world healthcare practices.

E. Limitations

The study acknowledges several inherent limitations in its design. One significant consideration pertains to the extent of generalizability of the findings. Despite the conscious effort to enhance the sample size, the study's outcomes primarily pertain to the population of patients visiting Korle Bu Teaching Hospital. Thus, it may not adequately represent a broader spectrum of patients seen in other healthcare facilities, raising questions about the broader applicability of the findings.

Another limitation arises from the potential for selection bias. This is due to the self-selection of participants, wherein patients who agree to take part in the study might possess distinct characteristics or experiences related to depression compared to those who decline participation. Such an inherent bias could have introduced a potential skew in the study's outcomes, affecting the accuracy of the findings.

Moreover, a noteworthy limitation stems from the reliance on self-reported data to assess depression among participants. This approach introduces the potential for both recall bias and social desirability bias. Participants may have inadvertently underreported or over reported their symptoms due to memory-related issues or a tendency to provide responses they believed were socially desirable.

Time constraints also feature as a limitation. The study's duration was confined to a specific timeframe, which might not fully encompass the variable and evolving nature of depression. This limitation could hinder a comprehensive understanding of the spectrum of symptom severity and potential fluctuations that can occur over time. Additionally, the cross-sectional nature of the research design is another limitation to consider. This approach captures data at a single point in time, which may not adequately capture the dynamic nature of depression and its trajectory. Longitudinal studies that track participants over an extended period would likely provide a more insightful perspective on how depression evolves.

Furthermore, while the study's primary data collection method involves self-administered questionnaires, this approach might not fully capture the nuanced aspects of depression. Incorporating additional data collection methods, such as interviews or clinician assessments, could potentially yield a richer and more comprehensive understanding of participants' experiences and mental health.

Lastly, the study is conducted within the constraints of available resources, which include limitations in terms of time, budget, and personnel. These constraints may have influenced the scope of the research, potentially impacting the depth and breadth of data collected and analysed.

CHAPTER SIX
CONCLUSION

The findings from this research offer insights into the prevalence of depression and coping strategies among patients with diabetes at Korle Bu Teaching Hospital. The observed prevalence of depression of 21.0% was notably similar to the findings of other studies with comparable objectives. These parallels underscore the consistency of the observed prevalence and provide a broader context for interpreting the mental health outcomes of diabetic patients. Furthermore, the lower prevalence compared to another study suggests that mental health outcomes can vary significantly across different cultural and environmental contexts. This finding highlights the importance of considering contextual factors when assessing and addressing depression in diabetic patients. It highlights the need for tailored interventions that take into account social, cultural and environmental influences on mental health. Patients' high level of adherence to diabetic clinic appointments coupled to their regular engagement with healthcare providers and consistent monitoring of their condition which could have contributed to improved emotional well-being, reducing the risk of developing depressive symptoms was among possible explanation for the lower prevalence of depression in this study. Moreover, participants' possession of higher education levels is seen to have played a role in enhancing their coping strategies, as education has been associated with better health literacy and problem-solving skills.

Knowledge of diabetes plays a fundamental role in empowering individuals to make informed decisions about various aspects of their health. This study's assessment of depression knowledge among diabetic patients at the Korle Bu Teaching Hospital's Diabetic Clinic reveals a positive outcome, with participants demonstrating a commendable understanding of the subject. This aligns with similar findings from other studies, highlighting the significant role of education in fostering a deeper comprehension of diabetes-related matters. While patients exhibit satisfactory knowledge levels, the call for persistent efforts to enhance and sustain their understanding of depression remains imperative for optimal health outcomes. Ultimately, this study rehashes the critical role of education in empowering diabetic patients to proactively manage their health and stresses the need for dynamic, ongoing educational initiatives in healthcare settings.

The study identified that patients at Korle Bu Teaching Hospital demonstrated a preference for approach coping strategies, which was evident in their utilization of coping mechanisms such as acceptance, emotional support, and positive framing. Such approach-focused strategies are associated with adaptive responses to stress and have the potential to yield positive outcomes in diabetes management and emotional well-being. The use of these coping strategies is reinforced by the patients' knowledge of diabetes mellitus and the understanding of its impact on their lives, fostering a proactive approach to coping with the disease. The necessity of including patients aged 8 to 18 in the group employing the approach strategy, in contrast to the avoidant strategy evident in the obtained results cannot be emphasized. This goal can be achieved through the implementation of comprehensive education by clinic staff.

Interestingly, the study showed that patients with depression did not differ significantly in their coping strategies compared to non-depressed individuals. This suggests that the relationship between depression and coping mechanisms among diabetic patients is complex and multifaceted. Individual variations in psychological and social factors may contribute to diverse responses to emotional distress. Thus, healthcare providers need to adopt a personalized approach when addressing depression and promoting effective coping strategies tailored to each patient's unique needs.

CHAPTER SEVEN
RECOMMENDATION

There are a few practical recommendations that hold the potential to enhance the well-being of diabetic patients at the Korle-Bu Teaching Hospital.

One primary suggestion revolves around the enhancement of diabetic education. Acknowledging the notable educational attainment among patients, it is strongly advocated that diabetic education becomes an integral component of the services offered within the hospital's diabetic clinic. The admiration the clinic ought to equip patients with a comprehensive understanding of their medical condition, they can make informed choices and actively participate in managing their own health. This, in turn, can pave the way for improved health outcomes and a better prognosis.

In light of the diverse ethnic composition within the patient population, the provision of multilingual educational materials by the Clinic administration emerges as another critical recommendation. It is of utmost importance to ensure that educational resources are made available in languages that resonate with the different ethnic groups represented. This approach has the potential to empower patients to disseminate accurate information about diabetes within their respective communities, thereby fostering awareness and promoting healthier lifestyle practices.

While the study did not identify severe cases of depression, the presence of individuals grappling with varying degrees of depressive disorders suggests the viability of proactive measures. The establishment of dedicated support groups by the Endocrinology Unit of the Korle-Bu Teaching Hospital tailored exclusively for diabetic patients emerges as a significant strategy. These groups can serve as platforms for sharing personal experiences, acquiring positive coping mechanisms, and mitigating the risk of depression. A key focus of these support groups would be to encourage approach-oriented strategies that bolster mental well-being.

Finally, the study's methodology, which included a cross-sectional design, presents an opportunity for future research exploration. Longitudinal studies, which involve tracking participants over an extended timeframe, are suggested to scientists and researchers so as to gain deeper insights into how depression evolves and how coping strategies may change over time. Such a comprehensive understanding could inform the development of more targeted and effective interventions.

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