DEPRESSION AND ASSOCIATED FACTORS AMONG ADULT DIABETIC PATIENTS ATTENDING AT DIABETIC FOLLOW UP CLINIC OF MIKILILILAND HEALTH CENTER, ADDIS ABABA, ETHIOPIA

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A THESIS SUBMITTED TO THE SCHOOL OF PSYCHOLOGY, COLLEGE OF EDUCATION AND BEHAVIORAL STUDIES, ADDIS-ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE DEGREE OF MASTER OF ARTS (MA) IN COUNSELING PSYCHOLOGY.

Advisor:

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DECLARATION

I hereby declare that this thesis is my original work and has not been presented for a degree in any other university, and all sources of material used for this thesis have been duly acknowledged.

Name: Assamin Assafaw (M.D)

Signature: _____

Date: _____

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LIST OF ABBREVIATIONS AND ACRONYMS

AAU	Addis Ababa University
BMI	Body mass index
BP	Blood Pressure
DKA	Diabetic Keto Acidosis
DM	Diabetes Mellitus
ETB	Ethiopian Birr
FBS	Fasting blood glucose sugar
GP	General Practitioner
HMIS	Health Management Information system
MOH	Ministry of Health
NGOs	Non-governmental Organizations
NR	Non response
PHQ	Patient health questionnaire
SPSS	Software Program for Social Science
T1DM	Type I Diabetes Mellitus
T2DM	Type II Diabetes Mellitus
MHC	Mikilililand health center
WHO	World Health Organization
IDF	International Diabetic Federation

ABSTRACT

Objective: The aim of this study was to assess depression and its associated factors among type-2 diabetic patients attending at diabetic follow up clinic of Mikililand health center, Addis Ababa, Ethiopia,

Methods: A facility based cross-sectional study design was conducted among 159 type-2 diabetic patients attending at diabetic follow up clinic of Mikililand health center, Addis Ababa, Ethiopia, 2023.

Result: The overall prevalence of depression in the study was 41.5%. Those patient living in rent house [AOR= 5.927 (95% CI = 1.743,20.148)], those with duration of diabetes >5 yrs since diagnosis [AOR = 16.038 (95% CI = 1.611,159.3648)], those having family history of diabetes [AOR = 4.419 (95% CI =1.044,18.701)], those who had or experienced diabetes related complications [AOR= 9.166 (95% CI = 2.866, 29.314)] and alcohol use status [AOR = 30.148 (95% CI =4.670,194.630)] were significantly associated with depression among T2DM patients.

Keywords: Depression, diabetes, poor glycemic control, Mikililand health center, Addis Ababa, Ethiopia, 2023.

CHAPTER ONE : INTRODUCTION

1.1. Background

“Diabetes mellitus (DM) is the commonest disease of the endocrine system with changes in metabolism of carbohydrates, lipids and proteins. It affects almost every organ in the human body. The globally prevalence of diabetes is increasing at an alarming rate affecting around half a billion people. Saeedi and his colleagues recently did a study on global, regional and country-level diabetes prevalence estimation and projections and they estimated around 300 and 700 million people worldwide will suffer from diabetes by 2025 and 2045, respectively (Saeedi et al., 2019). Another study also concluded the burden of diabetes was becoming higher in developing countries as showed by a systematic review done in Ethiopia with prevalence of DM between 2% and 6.5% (Bishu et al., 2019).

The two major forms of diabetes are type 1 and type 2. Type 1 diabetes which accounts about 10% diabetes cases worldwide results from absolute deficiency of insulin due to autoimmune destruction of pancreatic β-cells. Usually type 1 diabetes affects children and young adults while type 2 diabetes most often happens in adults. Type 2 diabetes, which accounts 90% of all diabetic cases world-wide, is due to defective insulin secretion in the pancreas which results from inadequate compensatory increase of β cell mass and impaired glucose-dependent insulin release. As a result, this insulin resistance and/or relatively insufficient insulin secretion causes hyperglycemia. Usually type 2 diabetes mellitus is common in adults and majority of patients with diabetes may remain undiagnosed until complications become evident since the disease develops gradually (Braunwald et al. 2001).” Diabetic-neuropathy, nephropathy, retinopathy and

cardiovascular diseases are the commonest chronic complications in long-standing uncontrolled diabetes other than mental complications (Care, 2022).

Depression is another alarming public health problem characterized by depressed mood states and aversion to activity that can affect a person's thoughts, behavior, and emotions. Globally, depression is the second leading cause of disability and more than 150 million people suffer from depression (Gbadamosi et al., 2022).

Recently one study estimated that nearly 15% of the global population on average suffered from depression at least once in their lives (Charlson et al., 2019). Studies showed that depression is one of the prevalent comorbid mental illness in patients diagnosed with type 2 diabetes mellitus (Anderson et al., 2001). Being newly diagnosed with diabetes is a major life stress for the patients and most of them go through the typical stages of sadness such as denial, anger, depression, and acceptance. As a result , there is high likely to diagnosis depression as a common comorbid condition in many patients with diabetes throughout the course of treatments (Anderson et al., 2001). The majority of people with diabetes were struggling with moderate to severe form of depression with estimated prevalence of 15%-20% (Khan et al., 2019). A study conducted in Kenya (n=2,770) has found 42% of the study patients had symptoms of mild to severe depression among DM patients, and only 114 (4.1%) of them had confirmed diagnosis of a psychiatric condition (Gbadamosi et al., 2022).

In Ethiopia, the clinical managements of diabetes mellitus showed significant improvement by health providers but satisfactory attention was not given on the psychosocial impacts of diabetes. Depression is one of the commonest comorbid mental illness for patients with diabetes mellitus with ongoing and devastating outcomes (Azeze et al., 2020).

The prevalence of depression among T2DM patients and the associated factors vary in different areas as previous studies showed 21.3% (Engidaw et al., 2020) and 29.3% (Azeze et al., 2020) in studies done at Tirunesh Beijing General Hospital, Addis Ababa , Ethiopia and Halaba Kulito General Hospital, Ethiopia respectively. Many of the previous studies in Ethiopia were done at specialized and general hospital level (Engidaw et al., 2020) and the rate of depression were ranging from 13 to 41. 5% due to differences in study period, setting, and assessment tools (Dejenie et al.2015) . In diabetic patients; a diagnosis of depression reduces quality of life by increasing treatment non-adherence and risk of complications leading to poor prognosis and death. The mortality rate due to diabetes increases 1. 5 times in patients with depression (Costa et al. 2019).

The study was conducted to evaluate depression and its potential predictors in diabetic patients, attending the Diabetes Clinic at Mikililand Medical Center, Addis Ababa, 2023.

1.2. Statement of the problem

Diabetes by far and co-morbid depression too; doubles the life burden of diabetic individuals due to poor quality of life, poor adherence to their medication and self-care recommendations than non-depressed patients (Costa et al. 2019). It also contributed to poor prognosis and accelerates morbidity and mortality due to diabetes and its complications (Young et al. 2008). Depression was often unrecognized and undertreated in developing countries, and literature suggested that the causes of high rates of depression in diabetic patients were complex and multi-factorial (Saeedi et al., 2019). A study done at Adare Hospital Hawassa, 2016 by Tilahun and his colleagues found diabetes patients current alcohol use status, non-adherence to recommended diet, lack of social support, non-compliance with physical activity and poor adherence to medication therapy were strongly associated with depression among T2DM patients (Tilahun et

al., 2016). Almost all the studies in our country were done at a hospital level (Engida et al. 2020), which are the higher level of health care tiers in the country having sophisticated laboratory and diagnostic facilities and highly trained staffs including specialist physicians, which all have great effect on patient management. The overall prevalence of depression among T2DM patients in previous studies were found 37%, Mizan Tepi, Southern Ethiopia (Asefa et al., 2020], 29.3 %, in Halaba Kulito**,** and 21.3%, in Tirunesh Beijing. All these differences in the prevalence of depression might be because of a difference in demographic and socioeconomic related factors, difference in study periods and study population even though similar scales, PHQ-9 was used to assess depressione in all studies.

Taking in to account the existing problem under study that was comorbid depression among diabetic individuals and discrepancies among literatures, as the main stay of patient management, inadequate or nonexistent highly trained staff, unavailability of basic medications, and needy laboratory services were all supposed to contribute to poor service delivery at lower levels of health care tiers (i.e., health centers). It was anticipated that this study would offer up-to-date information and uncover new predictors for co-morbid depression among type 2 diabetic patients in the study area. The study also would provide crucial information and would fill the knowledge gap among healthcare providers in preventing and managing depression among T2DM patients. There were also a gap in diabetic education and adequate counseling services among patients with diabetes regarding the illness and the treatment approaches. This study further would identify the gaps and would suggest an integrated care by multidisciplinary team to improve diabetic related morbidity and mortality among T2DM patients.

Therefore, this lower health center (institutional) based cross sectional study aimed to determine the prevalence of depression and its associated factors among type 2 diabetic patients attending diabetic follow up clinic of Mikililand health center, Addis Ababa, Ethiopia.

1.3. Objectives of the Study

1.3.1. General objective

- To assess the prevalence of depression and its associated factors among type-2 diabetic patients attending at diabetic follow up clinic of Mikililand health center, Addis Ababa, Ethiopia.

1.3.2. Specific objectives

- To assess the prevalence of depression among diabetic type-2 patients attending at diabetic follow up clinic of Mikililand health center, Addis Ababa, Ethiopia.
- To measure severity of depression among adult diabetic type 2- patients attending at diabetic follow up clinic of Mikililand health center, Addis Ababa, Ethiopia.
- To identify factors associated with depression among adult type-2 diabetic patients attending at Diabetic follow up clinic of Mikililand health center, Addis Ababa, Ethiopia.

1.4. Significance of study

This lower level health tier (institutional) based cross sectional study aimed to determine prevalence of depression and associated factors among patients attending diabetic follow up clinic of Mikililand health center (MHC), Addis Ababa is important in providing a better understanding of recent prevalence of depression among T2DM patients and the major associated predictors that contribute to it. The study will help health care professionals and

management teams working at MHC in identifying the health facility related gaps in the service areas among patients with diabetes mellitus. It specifically will provide necessary information for healthcare providers at Mikililand health center to implement appropriate treatment measures or care and develop evidence based intervention strategies for diabetic patients. The study also will help them to screen periodically, identify and treat all adult diabetic patients for depression as early as possible so that it helps in preventing diabetes related complications, minimize psycho-social impact of diabetes and improve depression free days. The study can also be used as a bench mark in establishing multi-disciplinary and integrate counseling service for all patients who have a follow up at the health center.

This study also will contribute to the scientific body of knowledge (for policy makers, health planners and departments at different level) to give adequate attention for diabetes patients on follow up at health centers level. The study will by an evidence based recommendation for policy makers to provide community based health education, periodic screening and counseling service for depression at all healthcare levels including the involvement of psychologists and psychiatrists to have a say on national health police drafts about non-communicable diseases.

Furthermore, this study can be used as a reference for other studies which will be done at health center level having similar objectives.

1.5. Operational definitions and variable measurements

Level of Depression: Was measured by PHQ-9 scale that is widely used to measure level of depression and accordingly it was classified as follows:-

- No Depression: a self-reported depressive symptom with a PHQ-9 score of less than five is recognized.

- Depression: a self-reported depressive symptom with a score of at least five on the PHQ-9 scale.

Severity of depression patients were assessed after asking how often patients had been bothered by various depressive symptoms in the past two weeks. There were 9 questions which assessed how the patients felt in the past 2 weeks which were developed from DSM-IV MDD symptomatic criteria and they chose from four options: complete not at all, many days, more than half of days and almost every day and each question is scored from 0 (not at all) to 3 (almost every day). The total score were calculated by adding each scores of the nine questions responded by the patients and the scores ranges from 0 to 27 (Rahman et al., 2022).

Accordingly, patients with PHQ-9 score of 5 and more were said to have depression and furthermore the severity of depression were also classified according to the total score of PHQ-9 as follows;

- Mild depression: PHQ-9 score 5 - 9
- Moderate depression: PHQ-9 score 10-14
- Moderately severe depression: PHQ-9 score 15 - 19
- Severe depression: PHQ-9 score 20 -27 (Rahman et al. 2022).

1.6. Limitation of the study

The limitation of this study was that the level of depression was determined by participant's response (self-reported scale method) which might not reflect the actual status of the source population. The small sample size and single facility based study were another major limitations identified in this study. Although this study showed high prevalence of depression (41.5%)

among T2DM patients and the associated predictor variables were identified, cause-effect relationship cannot be established between the predictor variables and the outcome variable. It is also difficult to point out whether the depression is an independent diagnosis by itself or not. Even if; the advantage of this health facility based interviews weighted some of respondents might have denied their true mood state.

Hence, the actual prevalence of depression may be even higher.

CHAPTER TWO : LITERATURE REVIEW

One of the concerning public health issues, depression is typified by a depressed mood and an avoidance of activities with an impact on the person's thoughts, behavior, and emotions. Approximately 150 million individuals worldwide experience depression at some point in their lives, making it the second most common cause of disability worldwide (Gbadamosi et al., 2022).

‘’Historically the term depression was gone back to the ancient 11 century before Christ in the Old Testament story of King Saul describing a depressive symptom and, in the 9th, and 8th century BC Ajax’s suicide in homer’s Iliad About. In 400 BC, Hippocrates used the term melancholia to describe mental disturbances which has similar presentation with major depressive episodes and around 30 AD, the Roman physician Census described melancholia, from Greek melan [“black”] and chole [“bile”]. The Greek physicians postulated the earliest biochemical formulation of any mental disorder and they understand it as, under the influence of the planet Saturn, made the spleen secrete black bile, ultimately leading to mood darkening through its influence on the brain which later manifest as a melancholic like symptoms. In 1840 French alienist Jean-Philippe Esquirol suggested melancholia as a primary disturbance of mood and prior to his work melancholia had been categorized as a form of insanity (ascribed to deranged reasoning or thought disturbance) from the nosology of depression (Boland et al., 2022).

Major depressive illness has the highest lifetime prevalence (nearly 17 percent) of any psychiatric disorder, according to epidemiological research from the most recent surveys. The lifetime and 12-month prevalence rates of major depression in the general population were assessed in 18 nations, with high and low-middle income categories. The average lifetime

prevalence of depression were estimated average 11.1 % in low income countries and 14.6 % (range 6.6 to 21.0) in high-income countries (Lim et al., 2018).

In Ethiopia different researches had different figures about the prevalence of depression in the general population. For example, according to the Ethiopian Federal ministry of health, Ethiopia Demographic and health survey (EDHS) report, the general prevalence of depression among the general population was estimated to be 5% (FMOH, 2012). Epidemiological data showed that prevalence of depression among T2DM patients were found different according to studies done 37% in S. Arabia in 2020 (Alhunayni et al., 2020), 42% in Kenya (Gbadamosi et al., 2022) and 37% in Mizan Tepi,Southern Ethiopia, in 2018 [Asefa et al., 2020].

The epidemiological difference on the prevalence of depression among T2DM patients were due to the difference in study perod, study area and difference in demographic and socioeconomic related factors of the study population even if all the studies used similar scales PHQ-9 tool to assess depressione. A study conducted at Hawassa Comprehensive Specialized Hospital, Southern Ethiopia, in 2016 showed depression was prevalent among T2DM patients with two-fold more common among women than men and this gender difference begins in early adulthood, most pronounced in people between the ages of 30 and 45 and also persists in the elderly (Tilahun et al., 2016). The difference in gender could be explained by the increased vulnerability for psychosocial stressors, increased stress sensitivity, multiple social roles among females, maladaptive coping strategies and the substance use disorders that can mask depressive symptoms more frequently seen in men (Tilahun et al., 2016). The prevalence of depression was more common among low socioeconomic individuals and this was usually associated with individuals with lower socioeconomic status do have a lower level of educational status, lower

income, poorer living conditions, homelessness and a higher rate of unemployment which all have a significant risk factor for depressive disorders (Asefa et al., 2020).

2.1. Clinical presentation of depression

Patients with depression presented with a ‘‘persistent low mood which lasts almost on a daily basis for more than two weeks, loss of pleasure, feeling hopeless, or unhappiness and distress which has a distinct quality that differentiates it from the normal emotion of sadness. This loss of interest or pleasure is characterized by difficulty to have pleasure from previously enjoyable activities and in severe form of depression; patients may abandon most of the things they valued in life’’ (Boland et al., 2022). These two symptoms are the typical core symptoms of depression and in diagnosis either of them must be present and patients may also have disturbance in other areas including sleep, energy and motivation to respond positively to pleasant events (Boland et al. 2022).

2.2. Theories of depression

The exact reason and mechanism why human being develops depression were not known, but it is believed depression has ‘’biological and psycho-social causes.’’ Even though, there is no single theory which fully explains depression; Kaplan and sadok’s synopsis of psychiatry, 12th edition has proposed some of the following theories of depression (Boland et al., 2022).

2.2.1. Neurotransmitter Disturbances

This is a theory which characterizes ‘’depression with biological cause which is due to disturbance in the neuro-chemicals indicating a direct role for the nor-adrenergic system in depression (Boland et al., 2022). This neurotransmitter includes dopamine, nor-epinephrine (NE), serotonin, GABA, glutamate and glycine. NE is believed one of the most compelling

pieces of data indicating a direct role for nor- adrenergic system in depression and the down regulations or decreased sensitivity of β-adrenergic receptors and clinical antidepressants. Serotonin and dopamine are the other common neuro chemicals which have a strong clinical importance with depression and any depletion of them may precipitate depression.'' This theory is strongly associated with other factors, such as hormonal and structural activation of Hypothalamic –Pituitary–Adrenal Axis.

2.2.2. Psychosocial theory

There were different views with regarding to this theory and cognitive behavioral theorists, believed that ''depression results from maladaptive, faulty or irrational thinking or cognitions taking the form of distorted thoughts and judgments whereas Freudian psycho-dynamic theory proposed that depression results from exaggerated self-blame and guilt as a result of a harsh superego which arises from early life experiences and interactions''.

2.2.3. Learned helplessness theory

This learned theory postulates and connects depression to the experience of uncontrollable external adverse situations or events, as a result individuals produce a low self-esteem. This is theory emphasizes the impact of external environment in shaping behavior and depression is usually associated with person's interaction to their environment. For example, the classical conditioning theory proposes depression as learned through associating external stimuli with negative emotional state and behavior is learned through observation, imitation and reinforcement. This theory was experimented with a laboratory dog with an electric shock from whom they couldn't have an escape (Boland et al., 2022).

Although different theorist proposed different theories, depression is a complex condition and no single theory could fully explain its causes. Depression is caused by a combination of bio-psycho-social and environmental factors associated with having diabetes mellitus (Young et al., 2008)

2.3. Depression and diabetes mellitus

In general, among diabetes patients depression is diagnosis when there are two weeks or more symptoms dysphoric feeling or low mood and anhedonia, which patients have difficulty to draw happiness from previously enjoyable activities. Associated with patients may have changes in their appetite & weight, sleep, decreased energy, depressing thoughts characterized by worthlessness, guilt, difficulty in concentration, suicidal ideation or plan'' (Charlson et al., 2019). The DSM-5 TR states that in order to diagnosis depression as a mental illness, a history of mania or hypomania, substance related disorders as well as any medical conditions should be excluded first and, a person must have at least 5 symptoms, (1 of which must be one of the first two listed in DSM-5) and the symptoms must cause distress or impaired functioning in social, occupational, or other significant areas.

A study recently estimated that nearly 15% of the global population on average suffered from depression at least once in their lives and the worldwide prevalence of depression is increasing (Charlson et al., 2019). In 2017 it was estimated around 258 million people worldwide to have depression which representing an increased rate by 49.86% as compared with the previously 1990 global estimate (Modi et al., 2022). Recently a meta-analysis study was conducted involving 18953 participants in total of 20 studies were included & the global prevalence of major depression in the elderly was found to be 13.3 % (Abdoli et al., 2022).

Diabetes mellitus is a common disease that affects the endocrine system and becoming more and more common worldwide, affecting about half a billion people as showed on the study done recently by Saeedi and his colleagues on global, regional and country-level diabetes prevalence estimation and projections of about 300 people will have diabetes all over the world by 2025 (Saeedi et al., 2019). Diabetes is becoming a bigger problem in poor countries too as study done in Ethiopia found that 2% to 6. 5% of people had diabetes (Bishu et al., 2019). The two major forms of diabetes mellitus are type 1 and type 2 diabetes. Type 1 diabetes, which accounts about 10% diabetes cases worldwide affects children and young adults while type 2 diabetes mellitus accounts 90% of all diabetic cases worldwide most often affects adults. Majority of patients with type 2 diabetes remain undiagnosed until complications become evident since the disease develops gradually (Braunwald et al., 2001). Diabetic-neuropathy, nephropathy, retinopathy and cardiovascular diseases are the commonest chronic complications in long-standing uncontrolled diabetes other than mental complications (Care, 2022).

The exact cause-and-effect relationship between depression and diabetes is not clearly established, but is thought to be due to a variety of factors related to the psychosocial impact of the disease, common genetic susceptibility, and pathophysiological abnormalities involving immune and neuroendocrine pathways as well as micro vascular brain damage caused by the diabetes. Diagnosis of depression in patients with diabetes is often associated with poor disease control and impaired quality of life (Mezuk et al., 2008). Many patients diagnosed with diabetes may experience typical stages of grief, such as denial, anger, and depression; therefore, many of them will likely develop some form of depression. Though the two illnesses are separate entities and are by themselves major health problems in the world; the association between them is now becoming well established from growing research in the field of medicine. Most notably,

evidence showed that the relationship between depression and T2DM has been found to be bi-directional (Darwish et al., 2018) and the likelihood of depression in (T2DM) patients was approximately double that found in the overall population (Paulraj et al., 2017) whereas depressed patients have 60% increased risk of developing type 2 diabetes (Azeze et al., 2020).

2.4. Prevalence, relative risk and risk factors of depression in DM patients

Compared to non-diabetic controls, "patients with DM are reported to be about 1.6 -3 times as likely to suffer from co morbid depression (Care, 2022). Diagnosis of medical comorbidity might be a significant factor contributing to the increased prevalence of depression in DM and since depression rates in patients with DM but no other comorbidities were found to be comparable to healthy controls".

Diabetes and depression seemed to have bidirectional relationship and the relative risk for developing T2DM in patients with depression (Depression→Diabetes) was reported as high as 1.6 times whereas; according to two recent meta-analyses of prospective studies the relative risk for developing depression in patients with diabetes was around 1.2 (Mezuk et al., 2008).

The estimated variation in the prevalence of major depression depends on the depression assessment tools (standard interview or self-report questionnaire), depression classification, study design (controlled or uncontrolled), sample size and type of diabetes. In particular, with respect to biases related to assessment methods, depression was detected at approximately two to three times higher rates when specific thresholds were applied in self-report questionnaires than when self-reports were applied and assessed using standardized interviews. Other researchers suggest that the burden of depression in patients with T2DM appears to be slightly higher than in patients with T1DM, although this difference is not considered statistically significant (Care,

2022). To compare this difference, it will be necessary to evaluate other potential confounding factors such as patient age, duration of diabetes, type of diabetes treatment, glycemic control and diabetes related complications in each subtypes.

The prevalence of depression in diabetes patients varied between studies, and this difference was largely driven by the types of assessment tools used, study design, sample size, diabetes type, study area, or study population (Paulraj et al., 2017). Depressive symptoms were found to be slightly more common in T2DM than in T1DM, but this difference was not considered statistically significant. This variance might be related to the high rate of micro-complication and macro-complications, which are more predominant in patients with type 2 diabetes (Care, 2022). In general the depression among T2DM patients was highly influenced by socio-demographic factors of the patients including age, marital status, religion, educational status, occupation status, housing condition, family size, and family's monthly income of the patients. Associated with that patients clinical and life style related factors played a great role as a predictor variables for depression among patients with diabetes mellitus (Tilahune et al., 2016). This patients clinical and life style related factors includes duration of diabetes since diagnosis, duration of treatment, DM complication, glycemic control, presence and type of comorbidity, family history of DM, family history of psychiatric illness, cigarette smoking, alcohol use and khat chewing status (Asefa et al., 2020). On top of this other health service related factors including distance from home, means of transportation to the health facility, diabetes education at the health facilities about diabetes and life style modifications, problems faced in the health facility during service delivery including shortage of medications, long waiting time, poor communication and poor governance from the health care providers played a great role (Gbadamosi et al., 2022).

Associated with that patients marital status, presence of diabetes related complications, and residential area were associated with increased odds of depression among diabetes mellitus patients (Asefa et al., 2020). In the same way; another study found that the sex, age, family monthly income and educational level of the patients were significantly associated with depression among T2DM patients (Tilahune et al., 2016).

2.5. Depression among T2DM patients: International to national studies

A meta-analysis examining the relationship between depression and the development of diabetes found that the risk of developing type 2 diabetes was 37% higher in adults with depression than in adults without depression (Young et al., 2008).

In a study done in Saudi Arabia among 422 diabetic patients, 37% of them had depression; Out of them 23%, 9% and 5% had mild, moderate and severe depression respectively. The study concluded patients with lesser than secondary education and low family income were found to be significantly associated with increase in the risk of depression (Alhunayni et al., 2020).

At Muhimbili National Hospital, Tanzania, in 2018, a cross-sectional descriptive study was conducted using the PHQ-9 scale on 353 diabetic patients, to determine the rate of depression and related factors in diabetic patients. In the study, 353 participants were recruited using a systematic sampling technique from a computerized registry and socio-demographic and clinical characteristics were collected and analyzed for association their association with depression and 30% of them had mild or moderate depression. Among the study participants ‘’nearly half (44.2%) were between 41 to 60 years of age and the majority were females (64.9%) and had type 2 diabetes (79.6%). The study found that being on insulin therapy and having a current smoking status were found to be independent predictors of mild to moderate depression among diabetic

patients''. Patients on insulin therapy were almost twice as likely and where as being current smokers were almost seven times more likely to have mild to moderate depression respectively (Mohamed et al., 2020).

42% of the study patients were found to have symptoms of mild to severe depression in the study conducted in Kenya (n=2,770) among inpatient and outpatient clients, and only 114 (4.1%) of among them subjects had a working diagnosis of a psychiatric condition (Gbadamosi et al., 2022).

Another Institutional based cross-sectional study was conducted at Mizan-Tepi University General Hospital (TGH), Southern Ethiopia, 2018 among 423 adult diabetic patients (age> 18yrs) who had a follow up and on medications least six months in the hospital and the overall prevalence of depression were found to be 37.0%. The majority (44.7%) of the patients had mild depression, while only 2% had severe depression. The prevalence of depression was 39.9% and 31.7% among males and females respectively. Prevalence of depression was found higher among singles (69.4%) compared to married (27.8%) and divorced / widowed (46.5 %). In addition, the study found that urban residents also had a higher prevalence of depression than rural residents (41.5% vs. 25.4%).The study concluded that being male, urban residence, single marital status, duration of diabetes mellitus 5 years and more, and having sexual dysfunction were associated with increased odds of depression among diabetes mellitus patients (Asefa et al., 2020).

Another institutional study was conducted on 260 diabetic patients attending the diabetes clinic at Hawassa Comprehensive Specialist Hospital, Southern Ethiopia in 2016, using systematic sampling among patients' diabetics who visited the hospital during the study period and were aged over 18 years who wasn't seriously ill were included. The study's predictor variables were

socio-demographic factors (age, gender, religion, ethnicity, marital status, education level and place of residence), medical factors (types of diabetes, duration of diabetes, blood sugar levels, and complications or comorbidities and behavioral factors (physical activity, diabetes medication adherence, and substance use). Data were collected using a structured questionnaire, and depression severity was measured using the PHQ-9 scale, and depression was reported as a score ≥5. The study found that the prevalence of depression was 41.5% and among women (53.3% vs. 31.2%), and that old age, low income, and low education level were significantly associated with depression in women research groups. Among personal and social variables, social problems, social support, and bereavement (spouse) were found to be significantly associated (Tilahun. et al., 2016).

At Halaba Hospital, SNNPR, Ethiopia another institution-based study was done in December, 2019 among adult patients with diabetes and depression was found to be 29.3%: having co morbid hypertension, poor glycemic control and having no child plays a significant factor for depression among T2D patients (Azeze et al., 2020).

At Tirunesh Beijing general hospital, Addis Ababa, Ethiopian an institution-based cross-sectional study was done from February to April 2019 among 403 diabetic patients and all diabetic patients who were on follow up at the OPD during the study period were considered as the study population. Newly diagnosed DM patients, Patients who were on anti-depressants and those diabetic patients who were critically ill were not included. Independent variables including socio-demographic factors, clinical factors, and psychosocial factors were used to measure depression and it was assessed by using patient health questionnaire-9 (PHQ-9). The study found that the prevalence of depression in diabetics was 21.3% and that living in rural areas, poor glycemic control, low social support and physical disability were associated with depression and

physical disability and low social support were independent predictors of depression (Engidaw et al., 2020).

2.6. Conceptual framework

The following figure shows conceptual framework for factors associated with depression among adult type 2 diabetic patients attending diabetic follow up clinic of Mikilililand health center, Addis Ababa, 2023.

The conceptual framework was developed after thorough review of different literature for associated variables that contributed for depression among diabetes patients.

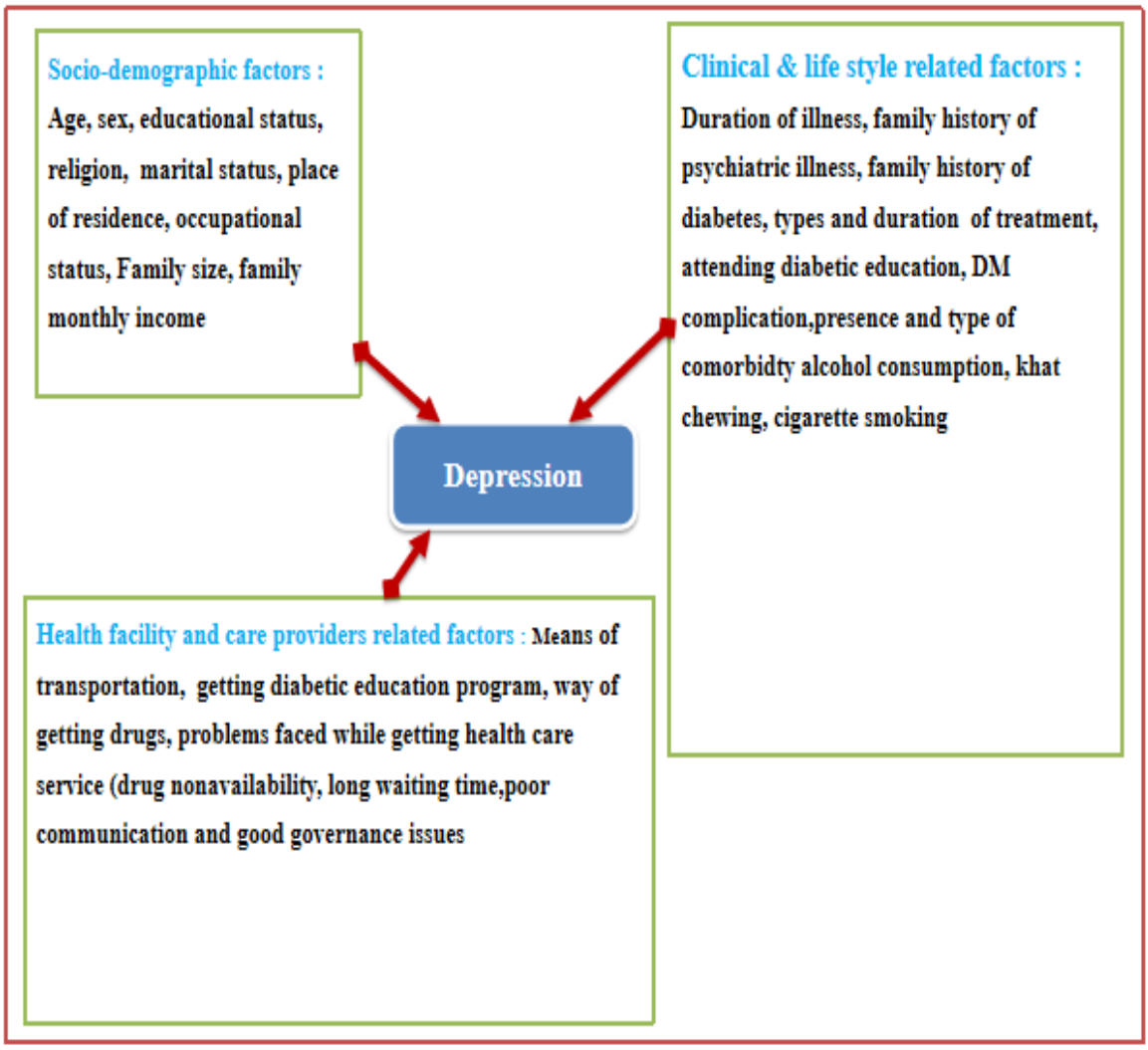

Figure 1 : Conceptual framework of variables associated with Depression among diabetic patients [adapted from different literature reviews]

CHAPTER THREE : METHODS AND MATERIALS

3.1. Study design

A facility-based cross-sectional study design was used for this study to arrange the proportion (Olsen et al., 2004). The incidence of depression among all T2DM patients were assessed. The study allowed to compare the impacts of different variables of depression on T2DM patients. This variables incudes age and sex of the patient, family monthly income, patient's educational level and diabetes related complications and other comorbid factors in relation to diabetes and depression level.

3.2. Study area and period

This study was conducted from July to October, 2023 at Mikilililand health center, Addis Ababa, Ethiopia, which is located in Addis ketema sub-city around Birchiko condominium site 4.7 Km west from St. Paul hospital. It is one of the public health facilities offering primary preventive and curative health care in Addis Ababa. The health center has many follow-up clinics for both pediatric and adult patients. Diabetic follow up clinic is one of the busiest divisions that provide services five times weekly (from Monday-Friday). The service is rendered by physicians, health officers and nurses and nearly 180 adult diabetic patients get registered for follow-up on monthly basis for the past six months (MLHC, 2023).

3.3. Population

3.3.1. Study population

The study population was all T2DM patients who had a follow up at Mikilililand health center for at least six months and those who fulfilled the eligibility criteria.

3.4. Inclusion and exclusion criteria

3.4.1. Inclusion criteria

T2DM patients aged ≥18 years on follow up for at least 6 months who were on anti-diabetic medication(s) and willing to participate in the study were included.

3.4.2. Exclusion criteria

Diabetic patients with age less than 18 years, those who are newly-diagnosed (< 6 months), and patients with previously diagnosed with any form of other psychiatric disorders if previously confirmed or on treatment, patients who were having repeated visit during the data collection period after they were included in their previous visit or those not willing to participate in the study were excluded.

3.5. Sample size determination and sampling techniques

3.5.1. Sample size determination

All type 162 T2DM patients who were on follow up at the OPD during the study were approached for the interview and 159 patients gave consent and interviewed.

3.5.2. Sampling technique and procedure

According to the last six consecutive months HMIS activity report of Mikilililand health center; there were around 180 diabetic patients on follow up and among them 162 patients were diagnosed with T2DM. All 162 patients with type 2 diabetes who fulfill the inclusion criteria and consented to participate in the study were approached for the interviewed and 159 of them gave consent.

3.6. Study variables

3.6.1. Dependent variable

- Depression

3.6.2. Independent variables

I. **Socio-demographic factors:** This factors are associated with the demographic factors of the patients on follow up which includes of patients' age, marital status, religion, educational status, occupation status, housing condition, family size, average family's monthly income.

II. **Clinical and life style related factors:** This are factors associated with patients' life styles and behaviour for being diagnosed with diabetes mellitus. It also includes diabetes treatments and complications associated with it. This includes duration since diagnosis, family history of DM, family history of psychiatric illness, duration on treatment, DM complication, presence and type of comorbidity, cigarette smoking, alcohol use and Khat chewing status.

Alcohol consumption, khat chewing and smoking status were assessed by asking participant to report their alcohol intake, chewing khat and tobacco smoking habits and

status. Accordingly, they were categorized as current users, who were using them in the past three months and not current users, for those who weren't using them within the past three months respectively.

III. **Health facility/service-related factors:** These are factors mostly associated with the health facility including the healthcare providers' attitude towards the patients. It includes distance from home, means of transportation and time taken to reach to the health center, getting health information and advice about diabetes and life style modifications, problems faced in the health facility during service delivery like shortage of medications, long waiting time, poor communication and good governance issue.

IV. **Fasting blood sugar level**: It was a blood sugar level in three consecutive months and measured 8 - 12 hours after fasting. The average fasting blood sugar level of the three consecutive months was used to define the glycemic control. Accordingly good glycemic control was defined as an average fasting blood sugar level between 70 to 130 mg/dl and any score which were greater or lesser than the scores was defined as poor glycemic control (Braunwald et al., 2001).

V. **The severity and level of depression:** It was measured by PHQ-9 scale which has a widespread acceptance in clinical settings and has been found to be internally consistent and validated in study done in Bangladesh university students showing "Cronbach's α for the PHQ-9 scale was 0.76 indicating acceptable consistency of this psychometric scale (Rahman et al. 2022)." Level of depression were classified in to two categories, which were whether the patients' had depression or not depending on the total PHQ-9 score of each patients.

Severity of depression also further classified among patients with depression depending of the magnitude of total PHQ-9 score ranging from mild depression (PHQ-9 score of 5-9) to severe depression (PHQ-9 score > 19).

3.7. Data collection tools and procedures

3.7.1. Data collection tools

Data were collected through pre-tested interviewer-administered questionnaire. Depression severity was assessed using the PHQ-9 scale, a widely used screening tool to assess and measure depression levels. The tool has a widespread acceptance in clinical settings and had been found to be internally consistent and validated in study done in Bangladesh university students showing Cronbach's α for the PHQ-9 scale was 0.76 indicating acceptable consistency of this psychometric scale (Rahman et al., 2022). The tool also been validated in our country and found to be internally consistent and validated in study done in Tikur Anbessa specialized hospital among cancer patients attending at the oncology clinic with Cronbach's α for the PHQ-9 scale was 0.78 (Degafe et al., 2020).

According to the DSM-IV criteria for major depressive disorder (MDD) and patients were asked how often they had been bothered by various depressive symptoms in the past two weeks and they chose from four options: complete not at all, many days, more than half of days and almost every day and each question is scored from 0 (not at all) to 3 (almost every day) and the total score ranges from 0 to 27. In general, PHQ-9 score is used as a screening tool but not a diagnostic tool for depression by itself. The lower the PHQ-9 score showed the less severe form

and the higher the score showed the severe form of the depression respectively and patients who had higher scores (PHQ-9 score > 9) were candidates for further referral and evaluation by psychologists and psychiatrists for clinical diagnosis and possible provision of psychotherapy, pharmacotherapy or a combination treatment.

According to the PHQ-9 score;

- No Depression: the PHQ-9 scale with a score < 5.
- Mild depression: PHQ-9 score 5 - 9
- Moderate depression: PHQ-9 score 10-14
- Moderately severe depression: PHQ-9 score 15 - 19
- Severe depression: PHQ-9 score 20 -27 (Rahman et al., 2022).

3.7.2. Data collection procedures

Two registered BSC nurse professionals and one medical doctor (GP) were recruited as data collectors and supervisors respectively who had previous experiences in data collection by using pre- tested interviewing using **kobo tool box** which is an electronics data collecting tool by administering questionnaire which were developed by compiling a number of questions adapted from similar study materials, review of relevant literature and articles that could address the objective of the study.

The Questionnaire contains five sections and including: -

Section I: Patient's socio-demographic factors

Section II: Clinical and life style related factors

Section III: Health facility/service-related factors

Section IV: Fasting blood sugar level

Section V: The severity and level of depression

The questionnaire was prepared in English and Amharic and the Amharic version was translated from the English version by a person who has a degree in foreign language. During sample collection, patients were oriented to the process and specifics of study participation, and verbal informed consent was obtained from each eligible study participant and respondent were approached and interviewed upon leaving the diabetes clinic. The principal investigator was responsible for closely monitoring and supervising all daily data collection activities.

3.8. Data management and quality control

To maintain uniformity in data collection; data collectors and supervisors received one day of proper training and orientation on the objectives of the study, method of data collection and the context of the Kobo data collection tool. Data were checked before approval on kobo tool for completeness, accuracy and consistency by principal investigator on daily base to assure quality of data before analysis. In order to evaluate the clarity of the questionnaire and the reaction of the respondent a pilot test was done in 5% of the total samples (8) at Woreda 05 health center on T2DM patients a week prior to the beginning of the actual data collection and the findings were used to correct unclear idea and collection process and the questionnaire were modified accordingly. I, as a principal investigator, were supervising the entire data collection processes closely on a daily basis.

3.9. Data processing and analysis

Data collected through the Kobo tool were double-checked and exported to Microsoft excel for any deletions and clearing of data. Finally the data form excel were exported to SPSS version 26 (for statistical analysis). Descriptive statistics (frequency, percentage, mean, and standard deviation) were calculated for demographics and other relevant factors and results were reported as percentages and frequency using tables and charts.

Multivariate logistic regression analysis was used to identify factors associated with depression. All predictor variables that had a significantly associated in bivariate analysis with p values $\leq$ 0.25 was included in the multivariable logistic regression model to evaluate the association between dependent and independent variables. P value $\leq$ 0.05 in multivariable logistic regression was considered statistically significant.

3.10. Ethical consideration

Support letter were obtained from the Addis Ababa University, school of Psychology. In addition, permission was obtained from the Clinical Director (CEO) and outpatient department (OPD) director of Mikililand health Center to conduct the study. Study participants were recruited and verbal informed consent was obtained on a voluntary basis after providing complete information about the aims of the study.

To keep the confidentiality of the study participants information, personal identifiers (*name and card number*) were not included in the data collection format instead a code was used and all recorded data on kobo tool were kept secure and only principal investigator can access to it. The results of the study will be disclosed only when it is necessary and for those who want to know it.

CHAPTER FOUR : RESULTS

4.1. Socio-demographic and economic characteristics

In total, 159 study participants were interviewed with a response rate of 98.1%. Non response was due to participant's lack of interest to participate (2 patients) and one patient was critically ill. Of the interviewed participants 63.5% (n: 101) were female, 68.6% (n: 106) were orthodox Christian followers and 72.96% (n: 116) were married. In addition, 42.14% (n: 67) of the study participants were living in a rental houses, 16.35% (n: 26) did not attend any formal education and 54.09% (n: 86) had an average monthly family income of < 5000 ETB. The median age of the participants was 59 ± 12.7 years. Depression status was measured using PHQ-9 tool and PHQ-9 score of greater or equal to five was recognized to have depression. The study found average family monthly income and level of education did not have significant association to depression among the study participants.

The details of socio-demographic and economic characteristics are described in the table 1.

Table 1: Socio-demographic and economic related characteristics among T2DM patients having follow up at Mikililand Health center, 2023 (N= 159)

Socio-demographic factors		Depression		
		No depression	Has depression	**Total**
Age	< 30 yrs	1	2	3
	30-60 yrs	49	28	77
	> 60 yrs	43	36	79
Sex	Female	50	51	101
	Male	43	15	58
Religion	Catholic	3	1	4
	Muslim	13	13	26
	Orthodox	60	46	106
	Protestant	17	6	23
Housing condition	Owned Private house	64	28	92
	Rent house	29	38	67
Marital status	Single	3	0	3
	Married	66	50	116
	Separated (Temporary)	2	0	2
	Divorced	8	5	13
	Widowed	14	11	25
Educational status	Illiterate/No formal education	13	13	26
	Read and Write only	10	13	23
	1-8 grade	27	14	41
	9-12 grade	25	18	43
	College/University graduate	18	8	26
Occupational	Housewife	34	34	68
	Merchant	10	9	19
	Governmental Employee	13	5	18
	NGO Employee	23	14	37
	Daily Laborer	3	0	3
	Others (specify)**	10	4	14
Family size	1-5	68	42	110
	6-10	25	24	49
Average monthly income	≤ 2500 ETB	11	14	25

(ETB)	2501 - 5000 ETB	37	24	61
	> 5000 ETB	45	28	73

Key: ** Others - Retired, ETB = Ethiopian Birr *by Dejenie et al., 2015*

4.2. Clinical, treatment and life style related factors

Among 159 of the study participants; 91 (57.23%) patients had > 5yrs since being diagnosis with T2DM, 79 (49.68%) patients had been on treatment for > 5years, 37.74% had diabetes related complications and 61.64% have other medical comorbidities. Depression was prevalent among patients with longer duration (> 5 yrs) since being diagnosed for DM, diabetes related complications and the presence of other comorbid medical illness.

The detail of clinical and treatment profile is described in the table 2.

Table 2 : Clinical, treatment and life style related factors among T2DM patients having follow up at Mikililand Health center, 2023 (N= 159)

Clinical, treatment and life style related factors		**Depression**		
		No, n	Yes, n	**Total**
Duration of DM since diagnosis	0.5 - 5 yrs	59	9	68
	> 5 yrs	34	57	91
Duration On Rx	0.5 - 5 yrs	68	12	80
	> 5 yrs	25	54	79
Family history of DM?	Yes	15	25	40
	No	78	41	119
Diabetes related complication?	Yes	14	46	60
	No	79	20	99

	Acute complications (DKA/HHS)	3	21	24
	Diabetic Retinopathy	9	19	28
	Diabetic Neuropathy	5	27	32
Type of complications?	Diabetic Nephropathy	0	3	3
	Decreased Libido /Sexual Dysfunction	0	5	5
	Diabetic foot ulcer	2	1	3
Hospitalization related to Diabetes	No	83	59	142
	Yes	10	7	17
Presence of comorbid illness?	Yes	45	53	98
	No	48	13	61
Types of Comorbidities	Hypertension	36	39	75
	Dyslipidemia	27	38	65
	Cardiac Illness (any form)	6	0	6
	Others *	1	3	4
Family history of psychiatric illness	Yes	5	7	12
	No	88	59	147

Cigarette Smoking status	Yes	3	3	6
	No	90	63	153
Alcohol use status	Yes	7	24	31
	No	86	42	128
Khat chewing status	Yes	4	4	8
	No	89	62	151

Key: * Parkinson's disease (1 case), RVI (1 case), Stroke (1 case) & Toxic MNG (1 case)

4.3. Health facility and service related factors

Among the study participants, 126 (79.25%) got treatment using CBHI, around three-fourth, 118 (74.2%), of them use public transport as a means of transport, 49 (30.82%), of them responded they never got any diabetic education at the service area, 8.8%, of them said they faced problems (long waiting time (> 40 minutes), shortage of medication, lack of entertaining materials like TV & benches at waiting area & health care providers are not respectful and caring) during service delivery in the health center.

The details of health facility/service related factors were described in the table 3.

Table 3: Health facility/service related factors among T2DM patients having follow up at Mikililand Health center, 2023 (N= 159)

Health facility related factors		Depression		
		Yes, n	No, n	Total
Means of transportation to the HC	By Taxi	69	49	118
	On foot	22	14	36
	Private transport/car	2	3	5
Have you ever got advice and diabetic education during service delivery?	Yes	60	50	110
	No	33	16	49
Way of getting the medication(s)-ADMs	Cash /Payment	19	13	32
	CBHI	74	52	126
	Free of charge	0	1	1
Have you ever faced problems in the HC during health care delivery?	Yes	7	7	14
	No	86	59	145
Type(s) of problem(s) faced in the HC during health care delivery	Shortage of Anti-diabetic medications	2	1	3
	Long waiting time (> 40 minutes)	4	2	6
	Lack of entertaining materials like TV & benches at waiting area	1	0	1
	Patient chart (Document) loss	0	1	1
	Health care providers are not respectful and caring	0	3	3

4.4. Glycemic control status among study participants

Among the study participants; two-third, 104 (65.4%), of the study participants were found to have poor glycemic control. Poor glycemic control were defined when the average three consecutive months fasting blood sugar level were greater than 130 mg/dl.

Table 4: Glycemic control status among type 2 diabetic patients having follow up at Mikililand Health center, 2023 (N= 159)

Variables	Category	Depression	
		No, n (%)	Yes, n (%)
Glycemic control status	Poor Glycemic Control	55 (55.6%)	49 (44.1%)
	Good Glycemic Control	38 (69.1%)	17 (30.9%)

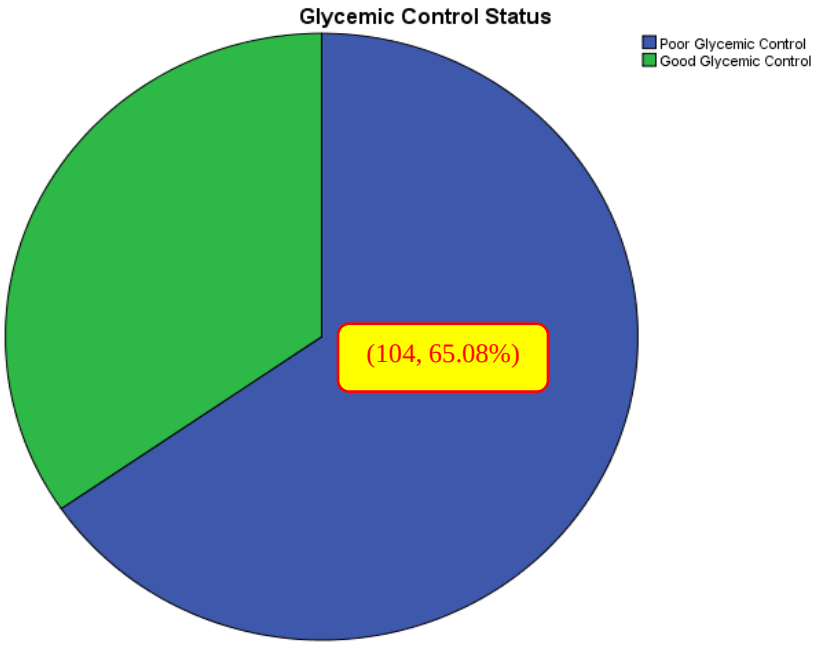

Figure 2: A pie chart showing Glycemic control status among type 2 DM patients, Mikililand HC, Addis Ababa, 2023

4.5. Depression status among study participants

Among 159 study participants, 66 (41.5%) of them had depression ranging from mild depression which accounts on 27.7% to moderately severe depression accounting on 3.8%.

Table 5: Overall Depression status among type 2 diabetic patients having follow up at Mikililand Health center, 2023 (N= 159)

Variables	Category	Frequency	Percent
Overall depression status	No depression	93	58.5
	Has depression	66	41.5

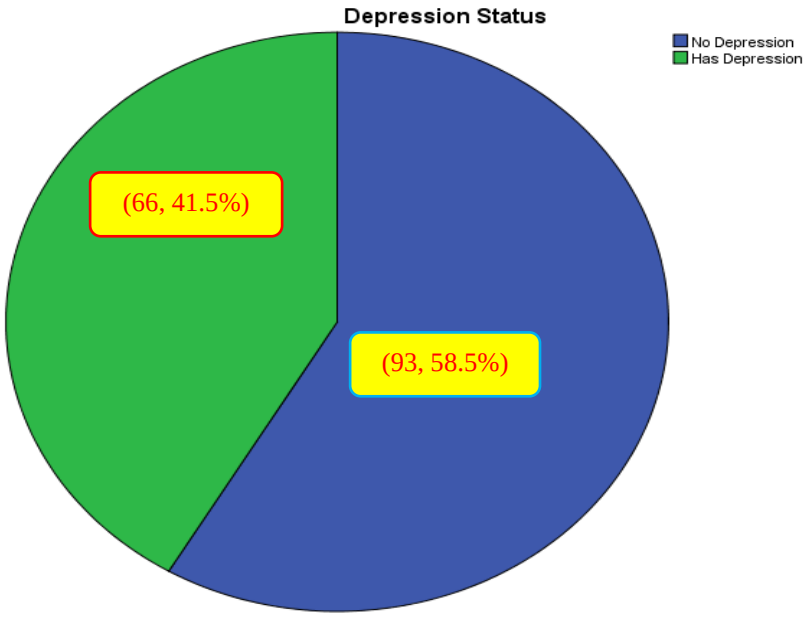

Figure 4: A pie chart showing overall Depression status among type 2 DM patients, Mikililand HC, Addis Ababa, 2023

4.6. Depression level (category) among study participants

Using PHQ-9 tool, a score of greater or equal to five was recognized to have depression and the severity and level of depression were further classified among the study based on the PHQ-9 score.

According to the PHQ-9 score;

- No Depression: the PHQ-9 scale with a score < 5.
- Mild depression: PHQ-9 score 5 - 9
- Moderate depression: 10-14
- Moderately severe depression: PHQ-9 score 15 - 19
- Severe depression: PHQ-9 score 20 -27 (Rahman, Dhira et al. 2022).

The prevalence of depression among the study participants was found to be 41.5% and among them 27.7%, 10.1%, and 3.8% for mild, moderate and moderate to severe depression respectively.

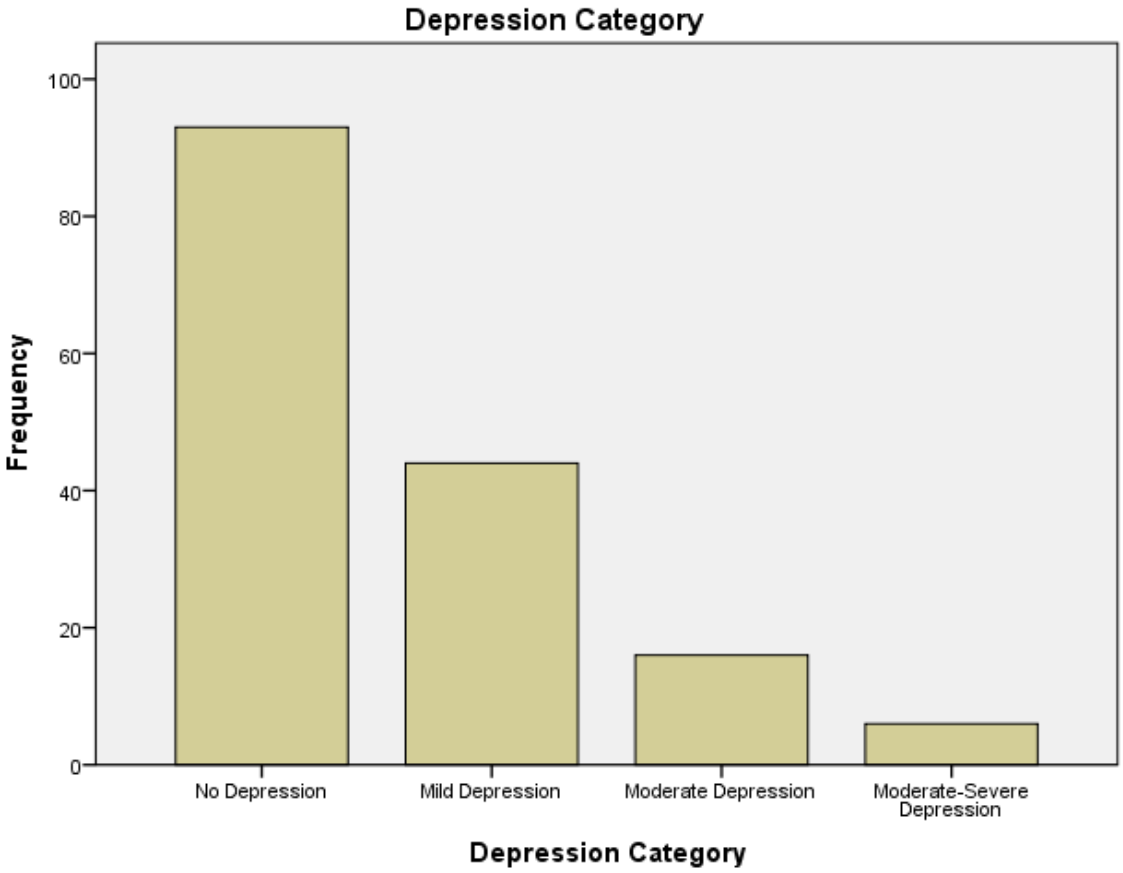

Figure 5: A bar chart showing category of depression level among type 2 DM patients, Mikililand HC, Addis Ababa, 2023

4.7. Predictor variables to depression among type 2 diabetic patients

4.7.1. Predictor variables associated with depression among type 2 diabetic patients in bi-variate logistic regression

Bi-variate logistic regression analysis was made to identify candidate predictor variables for multivariate analysis and crude odd ratio was used to compare each category of the predictor variables. For example, the magnitude of depression among female as compare to male. This study in bi-variate logistic regression analysis found sex of the patients (being female), housing

condition (living in rental housing), duration of diabetes since diagnosis and on medication >5 yrs (Asefa et al., 2020), those having family history of diabetes mellitus, presence of diabetes related complications and other comorbid medical illnesses, current alcohol use status and glycemic control (poor) status were candidate predictor variables for the outcome variable and the final predictor variables were identified by analysis multi-variate logistic regression and to calculated odds ratios (Table 6).

Table 6 : **Bi-variate analysis** for factors associated with depression among type 2 diabetic patients having follow up at Mikilililand Health center, 2023 (N= 159)

Variables	Category	Depression status		COR	95% CI		P-value
		No Depression n (%)	Yes, n (%) Has Depression		Lower	Upper	
Sex	Female	50 (49.5%)	51 (50.5%)	2.924	1.444	5.920	0.003*
	Male	43 (74.1%)	15 (25.9%)	1			
Housing condition	Rent	29 (43.3%)	38 (56.7%)	2.995	1.554	5.774	0.001*
	Owned	64 (69.6%)	28 (30.4%)	1			
Duration since diagnosis of DM (in years)	> 5 yrs	34 (37.4)	57 (62.6%)	10.990	4.841	24.952	0.000*
	0.5 - 5 yrs	59 (86.8%)	9 (13.2%)	1			
Duration on treatment	> 5 yrs	25 (31.6%)	54 (68.4%)	12.240	5.636	26.582	0.000*
	0.5 - 5 yrs	68 (85%)	12 (15%)	1			
Family Hx. of DM?	Yes	15 (37.5%)	25 (62.5%)	3.171	1.508	6.669	0.002*
	No	78 (65.6%)	41 (34.4%)	1			
Presence of DM related complication	Yes	14 (23.3%)	46 (76.7%)	12.979	5.987	28.134	0.000*
	No	79 (79.8%)	20 (20.2%)	1			
Presence of other comorbidities	Yes	45 (45.9%)	53 (54.1%)	4.349	2.095	9.027	0.000*
	No	48 (78.7%)	13 (21.3%)	1			
Alcohol use	Yes	7 (22.6%)	24 (77.4%)	7.020	2.800	17.603	0.000*

status	No	86 (67.2%)	42 (32.8%)	1			
Glycemic control Status	Poor GC	55 (55.6%)	49 (44.4%)	1.991	.999	3.968	0.05*
	Good GC	38 (69.1%)	17 (30.9%)	1			

Key: * P-value < 0.25, GC = Glycemic control, COR = Crude Odd Ratio, CI = Confidence Interval

4.7.2. Predictor variables of depression among T2DM Patients in multi-variate logistic regression

Multi-variate logistic regression analysis was used to calculate odds ratio and corresponding 95% confidence intervals for the predictor variables of depression. It predicts the probability and relationship of depression occurring based on multiple sets of predictor variables. All predictor variables which had significantly associated in bivariate analysis with p values < 0.25 were included in the multivariable logistic regression. multi-variate logistic regression was used to evaluate how much association one predictor variable has over the outcome variable in comparison to other predictor variables and odds ratio were measured using adjusted odds ratio (AOR) where as crude odds ratio were used for bi-variate regression. All predictor variables with P value < 0.05 in multivariable logistic regression were considered statistically significant.

In this study nine candidate predictor variables were selected by bi-variate analysis and those nine candidate predictor variables were analyzed with multivariate logistic regression to assess which variable had a strong association to depression among the study population. Diabetes mellitus diagnosis and treatment duration were classified in to two categories of those between 6 months to 5 years and those having more than 5 years since being diagnosed and on treatment for DM from a previous study done by Assefa and his colleagues (Asefa et al., 2020).

In this study, patients who were living in rent house [AOR= 5.927 (95% CI = 1.743, 20.148)], those longer duration of diabetes >5 yrs since diagnosis [AOR = 16.038 (95% CI = 1.611, 159.3648)], those patients having family history of diabetes [AOR = 4.419 (95% CI =1.044, 18.701)], those who had or experienced diabetes related complications [AOR= 9.166 (95% CI = 2.866, 29.314)] and alcohol use status [AOR = 30.148 (95% CI =4.670, 194.630)] were significantly associated with depression among type 2 diabetes mellitus patients (Table 7).

Table 7 : **Multi-variate logistic regression** model predicting factors associated with **depression** among T2DM patients having follow up at Mikilililand Health center, 2023 (N= 159)

Variables	Category	Depression status		AOR	95% CI		P-value
		No, n (%) No depression	Yes, n (%) Has depression		Lower	Upper	
Sex	Female	50 (49.5%)	51 (50.5%)	3.100	0.965	9.965	0.057
	Male	43 (74.1%)	15 (25.9%)	1			
Housing condition	Rent	29 (43.3%)	38 (56.7%)	5.927	1.743	20.148	0.04**
	Owned house	64 (69.6%)	28 (30.4%)	1			
Duration of DM since diagnosis (in years)	> 5 yrs	34 (37.4)	57 (62.6%)	16.038	1.611	159.648	0.018**
	0.5 - 5 yrs	59 (86.8%)	9 (13.2%)	1			
Duration on treatment	> 5 yrs	25 (31.6%)	54 (68.4%)	3.104	0.444	21.711	0.254
	0.5 - 5 yrs	68 (85%)	12 (15%)	1			
Family Hx of DM?	Yes	15 (37.5%)	25 (62.5%)	4.419	1.044	18.701	0.044**
	No	78 (65.6%)	41 (34.4%)	1			

Presence of diabetes related complications	Yes	14 (23.3%)	46 (76.7%)	9.166	2.866	29.314	0.000**
	No	79 (79.8%)	20 (20.2%)	1			
Presence of other comorbidities	Yes	45 (45.9%)	53 (54.1%)	3.232	.974	10.726	0.055
	No	48 (78.7%)	13 (21.3%)	1			
Alcohol use status	Yes	7 (22.6%)	24 (77.4%)	30.148	4.670	194.630	0.000**
	No	86 (67.2%)	42 (32.8%)	1			
Glycemic control	Poor GC	55 (55.6%)	49 (44.4%)	2.812	0.846	9.342	0.092
	Good GC	38 (69.1%)	17 (30.9%)	1			

Key: ** P-value < 0.05, GC = Glycemic control, AOR = Adjusted Odd Ratio; CI - Confidence Interval

CHAPTER FIVE: DISCUSSIONS

In this study from the 159 patients who participated, the findings revealed that the prevalence of depression among T2DM outpatient in Mikilililand health center was found to be 41.5%. This

study is in line with the study done in Hawassa university comprehensive specialize Hospital with a magnitude of 41.5% , southwest Ethiopia (Tilahune et al., 2016). However, it is high compared to the findings of the previous studies done 37%, in S. Arabia (Alhunayni et al., 2020), 37%, Mizan Tepi, Southern Ethiopia (Asefa et al., 2020], 30%, in Tanazania (Mohamed et al., 2020), 29.3 %, in Halaba Kulito (Azeze et al., 2020) and 21.3%, in Tirunesh Beijing hospital ((Engidaw et al., 2020). All these differences in the prevalence of depression might be because of a difference in demographic and socioeconomic related factors, difference in study periods and study population even though similar scale, PHQ-9 was used to assess depressione in all studies

In this study 50.5% (COR= 2.92) of females and 56.7% patients who were living in rent house had depression. This study found that the magnitude of depression in those who were living in rental house was almost three times compared to those living in their own houses (COR=2.99). The study also found that the prevalence of depression was 62.5% (COR=3.17) in patients who had a family of diabetes mellitus, 62.64% (COR=10.99) in patients who had longer duration of DM (>5yrs), 76.67% (COR=12.98) in patients who had diabetes related complication, 54.1% (COR=4.35) comorbid medical illnesses. In this study the prevalence of depression was 47.12% (COR=1.99) in patients who had poor glycemic control and 77.42% (COR=7.020) in patients who were acute alcohol users.

Among 159 study participants, 16.35% did not attend any formal education and 54.09% had an average monthly family income of < 5000 ETB. Although the prevalence of depression was slightly higher in patients with lower educational (< 8th grade) levels (43.96% vs. 37.68.4%) and low monthly family income (40% vs. 36.36%), in this study significant associations were not found between this two variables and depression unlike a study done in Saudia Arabia with

lesser than secondary education and low family income were found to be significantly associated with increase in the risk of depression (Alhunayni et al., 2020).

A study done in Tanzania, 2018 found that being current smokers was almost seven times more likely to have depression among diabetes patients Mohamed et al., 2020); in contrast this study did not find any significant association between smoking and depression.

In this study discriptive stastics showed the prevalence of depression was high among married (43.1%), divorced (38.46%) and widowed (44%) patients than singles. However, the study did not show any significant association between marital status and depression in multivariate regression compared to study done at Mizan-Tepi University and General Hospital (TGH), Southern Ethiopia in 2018 found the overall prevalence of depression was found higher among singles (69.4%) compared to married (27.8%) and divorced / widowed, 46.5 % (Asefa et al., 2020). Similarly this study also found 37.73% of the study participants had diabetes related complications and among them, 76.67% had depression. This finding was high compared with a study done at Mizan-Tepi University and General Hospital where prevalence of depression among patients with diabetic complications was 41% (Asefa et al., 2020). The study done at Mizan-Tepi University and General Hospital concluded that being male, single marital status, duration of diabetes mellitus 5 years and more, and having sexual dysfunction were associated with increased odds of depression among diabetes mellitus patients (Asefa et al., 2020); likewise this study found that diabetes related complication and duration of diabetes mellitus 5 years and more showed significant association with depression among T2DM patients in multi-variate regression.

In the same way; a study conducted at Hawassa Comprehensive Specialized Hospital, Southern Ethiopia, 2016 depression prevalence was found to be 41.5% and the study found that women (53.3% vs. 31.2%) and old age, low income and low educational attainment have significant association with depression among study groups (Tilahun et al., 2016); in contrast, this study did not found sex (being female), age (older age), low family monthly income and low educational status of the study participants to have significant association with depression in multi-variate regression analysis though descriptive statics showed slight variations.

Study done in Halaba Hospital, Ethiopia 2019 the prevalence of depression was found to be 29.3% and having comorbid hypertension, poor glycemic control and having no child had significant association with depression among T2D patients (Azeze et al., 2020): similarly this study found that comorbid hypertension and poor glycemic control had a significant association with depression in bi-variate regression analysis but not in multi-variate regression.

In this study depression prevalence was highly influenced by different factors and bi-variate logistic regression analysis was made to identify candidate predictor variables for multi-variate analysis. In bi-variate logistic regression analysis nine variables including female sex, living in rental housing, longer duration of diabetes since diagnosis and on treatment, having a family history of diabetes mellitus, presence of diabetes related complications and other comorbid medical illnesses, alcohol use status, and poor glycemic control status were identified to have a strong predictive value for the outcome variable.

Multi-variate logistic regression analysis was used to calculate odds ratios and corresponding 95% confidence intervals for the predictors of depression. Finally the nine variables which were selected by bi-variate logistic regression analysis were analyzed with multi-variate logistic

regression. Those patients who were living in rent house [AOR= 5.927 (95% CI = 1.743,20.148)], those with duration of diabetes >5 yrs since diagnosis [AOR = 16.038 (95% CI = 1.611,159.3648)], those having family history of diabetes [AOR = 4.419 (95% CI =1.044,18.701)], those who had or experienced diabetes related complications [AOR= 9.166 (95% CI = 2.866, 29.314)] and alcohol use status [AOR = 30.148 (95% CI =4.670,194.630)] were significantly associated with depression among type 2 diabetes mellitus patients.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1. Conclusions

This study indicated overall prevalence of depression was found to be high, which was 41.5%, among them 27.7%, 10.1%, and 3.8% had mild, moderate and moderate to severe depression respectively. This study found the longer duration of diabetes mellitus since diagnosis (> 5yrs.), the presence of complications associated with diabetes, family history of DM, patient's current alcohol use and housing condition status has significantly association with depression among T2DM patients.

Depression plays a significant role for the morbidity and mortality associated with diabetes mellitus. Therefore, more efforts are required to screen all adult diabetic patients periodically for depression with an integration of psychological assessment and counseling service provisions in chronic follow up OPD. Further, a deep and well-designed study that includes a qualitative approach is recommended to address other factors that are associated with depression prevalence among T2DM patients in different approaches.

6.2. Recommendations

The study found that 41.5% (n: 66) of the respondents had depression and 30.82% (n: 49) of the patients who had a follow up at Mikilililand health center responded diabetic education were not provided for them throughout the course of their follow up.

Based on the finding of this study, the following recommendations were forwarded to different stakeholders:

- **For Mikililand health center**

  - It is recommended to avail medications and adequate staffs to minimize long waiting time and give compassionate, respectful and caring training to staffs working to patients who have a follow up chronic OPD as the finding of the study, 8.8% (n: 14) of the patients responded they faced problems in the health center during health care delivery. These problems includes shortage of anti-diabetic medications, long waiting time (> 40 minutes), health care providers were not respectful and caring, patient chart were lost and lack of entertaining materials like TV & benches at waiting area.

  - It is recommended to MHC staffs working at diabetic follow up clinic to be polite, respectful and caring to their clients as 1.88% (n:3) of the patients responded health care providers were not be polite, respectful and caring and all of them also had depression too.

  - Establish and integrate counseling service areas for those patients who have a visit at diabetes clinic to assess their psycho-social need on top of their primary medical care as the study found 41.5% of T2DM patients on follow up at the MHC had depression.

  - It is recommended to work on prevention and early identification of diabetes complications and comorbid medical conditions as the study found 61.63% (n: 98), 37.73% (n: 60) and 65.4% (n: 104) of the patients had comorbid medical illnesses, diabetes related complications and poor glycemic control respectively.

- **For Health Departments, Policy makers and Medias**

  - Policy makers and other stake holders should give attention to increase drug availability for patients with diabetes mellitus as 79.25% of the respondents were getting their anti-diabetic medication using community based health insurances (CBHI).

  - To search possible alternatives to provide affordable housing for older patients with diabetes to minimize the economic related stress as the study found 42.14% (n: 67) of the respondents were living in rental house which had a strong predictive value for depression in this study [AOR= 5.927 (95% CI = 1.743,20.148)].

  - It is recommended to providing community based health education, periodic screening and counseling service for depression at all healthcare levels this was evidenced by the high magnitude of depression (41.5%) among T2DM patients in this study.

  - Medias have to promote social behavioral changes and communications related to depression among patients with diabetes mellitus due to the high prevalence of depression (41.5% in this study) among patients with T2DM.

- **For researchers**

  - Further, a deep and well-designed study that includes a qualitative approach is recommended to address other areas which are associated with depression and other stress related mental illnesses.

  - It is also recommended to do a research by increasing sample size and study areas; and if possible by changing study design involving all tiers of health care among both T1DM and T2DM patients.

  - Moreover, the high prevalence of depression may have vicious and bi-directional relationship with diabetes and researchers can suggest and do an intervention studies that aim to minimize the prevalence of depression early in the course of illness.

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ANNEXES

Annex I : Information sheet and informed consent form (English version)

Dear Sir, madam

Good morning / Good afternoon; My name is---------- I am here today to collect data for a study entitled "Depression and its associated factors among type-2 diabetic patients attending at diabetic follow up clinic of Mikililand health center, Addis Ababa, Ethiopia, 2023", which is being conducted by **Dr.Assamin Assafaw (M.D.**) from school of Psychology, college of education and behavioral studies, **Addis Ababa University.** The main purpose of this study is to assess level and factors associated with depression among diabetic patient aattending diabetic follow at Mikililand health center, Addis Ababa. I am asking you and others to voluntarily participate in this study & what is expected from everyone is to respond questions which take about fifteen to twenty minutes. Your real honest participation will contribute to generate information that could be used for better health program design and improvement of health services which will help to improve depression free days which are essential for improving quality of life, the long term out comes (morbidity and mortality) of diabetes mellitus. However, your participation is fully voluntary and you are not obligated to participate in the study. The data you provided will be kept in a highly confidential manner by using only code number in kobo toolbox which is filled by the principal investigator and the data and none of your personal identifiers will be on the questionnaire. There is no risk associated with participating in this study. If you feel discomfort with study, it is your right to drop it any time you want. If you have questions regarding this study, please feel free to contact the principal investigator via his address:

***Assamin Assafaw (M.D.)**; Tel: +251-912-022-155/-926-309-574*

Email: assamin4 @ gmail.com

Are you willing to participate? Yes [continues interviewing], No [thanks and stop/end interview]

Annex II : Questionnaires (English Version)

- A questionnaire prepared for collecting data for the study aiming to assess level of depression and its associated factors among adult diabetic patients aattending at diabetic follow up clinic of Mikililand health center, Addis Ababa, Ethiopia, 2023.
- Dear Participant,
  - I would like to thank you for your cooperation for answering this questionnaire.
  - You are kindly requested to answer the questions correctly and honestly so that your accurate responses are highly significant and influential for valuing the results of the study
  - It's not needed to write your name and rather we use a code no so that your response will be kept confidential.
- Dear Data collector
  - There are multiple choice questions to be answered by making "select where indicated fill in the blank space.

Thank you all for taking time to complete the questionnaire!

Questionnaire code----------

Section I: Socio-demographic factors

S. №	Questions	Coding Categories	Code
101	Age	-------- Years	
102	Sex	1. Male 2. Female	
103	Religion	1. Muslim 2. Orthodox 3. Protestant 4. Catholic 5. Other (specify) ----------	
104	Current Marital status	1. Single 2. Married 3 Divorced 4. Widowed	
105	Educational status	1. Illiterate 2. Read & write 3. 1-8 grade 4. 9-12 grade 5. College/university graduate	
106	Occupational status	1. House wife 2. Gov't employee 3. Private employee 4. Merchant 5. Daily laborer 6. Student 7. Other (Specify) ----------	
107	Living condition?	1. Own home 2. Rent	,
108	What is the average monthly income of the family? [In ETB]	1. < 2500 ETB 2. 2501-5000 ETB 3. > 5000 ETB	

Section II: Clinical & life style/Behavioral related factors

S. №	Questions	Coding Categories	Code
201	Duration of DM since diagnosis?	----------years	
202	Duration on treatment	----------years	
203	Family history of DM?	1. Yes 2. No 3. I don't know	
204	diabetes related complication	1. Yes 2. No	
204*1*	If Yes to Q204, What are the complication(s)	1. Acute complications (DKA/HHS) 2. Diabetic retinopathy 3. Diabetic Neuropathy 4. Diabetic Nephropathy 5. Decreased Libido 6. Diabetic foot ulcer 7. Others (specify)------	
205	History of Hospitalization for DM Complications?	1. Yes 2. No	
206	Presence of other medical illness/Co-morbid illness?	1. Yes 2. No	Chart Cross-Check
206*1*	If Yes to Q 206, what commodities do you have?	1. Hypertension 2. Ddyslipidemia 3. Ccardiovascular disease 4. If other specify: _____	
207	Attending diabetic education at your health center?	1. Yes 2. No	
208	Family history of Psychiatric illness	1.yes 2.No	
209	Cigarette Smoking status	1. Yes 2. No	
210	Alcohol use status	1. Yes 2. No	
211	Khat chewing status	1. Yes 2. No	

Section III: Health facility/service-related factors

S. №	Questions	Coding Categories	Code
301	Means of transportation to the Health center	1. On foot 2. By Bajaj 3. By Bus/taxi 4. If other specify: _____	
302	Do feel waiting time is a problem during your follow up visits	1. Yes 2. No	
303	During any of your diabetic clinic visit did you get health education & advice about DM and life style modifications like exercise, diet & drug adherence?	1. Yes 2. No	
304	How do you get the medication(s)? Way of getting Medications?	1. Cash/payment 2. CBHI 3. Free of charge	
305	Have you ever faced pproblems in the health center during health care delivery?	1. Yes 2. No	If No, skip to Section IV
306	If Yes to Q 305, what are these problems? (multiple answers are possible)	1. Shortage of medication(s) 2. Long waiting time 3. Poor communication & good governance issue (that hindered you from taking medications) 4. If other specify: _____	

Section IV: **The last three months fasting blood sugar level**

S. №	Questions	Result	Remark
401	1st month FBS		
402	2nd month FBS		
403	3rd month FBS		

Section V: Questions to assess the severity and level of depression: Measured by Patient health questionnaire (PHQ-9 scale)

S. №	Questions	Coding Categories			Code
	Over the last 2 weeks, how often have you been bothered by any of the following problems? (Use "✓" to indicate your answer	Not at all	Several days	More than half the days	Nearly every day
		0	1	2	3
501	Little interest or pleasure in doing things				
502	Feeling down, depressed, or hopeless				
503	Trouble falling or staying asleep, or sleeping too much				
504	Feeling tired or having little energy				
505	Poor appetite or overeating				
506	Feeling bad about yourself — or that you are a failure or have let yourself or your family down				
507	Trouble concentrating on things, such as reading the newspaper or watching television				
508	Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual				
509	Thoughts that you would be better off dead or of hurting yourself in some way				
	Total score				

This is the end of our questionnaire.

Thank you very much for taking time to answer these questions. We appreciate your help.

ጠፍ ይስጥልኝ!

እንደምን አደሩ/ዋሉ ፤

ስሜ---------- ይባላል።

''በሚሊሊላንድ ጠፍ ጣቢያ ክትትል ላይ ባሉ አዋቂ የስኳር ህመምተኞች ላይ የድባቴ ሁኔታ እና ተያይዝነት ያላቸውን ምክንያቶች ለማወቅ'' እየተካሄደ ባለው ጥናት ሚጃ ለማብሰብ ከ አዲስ አበባ ዩኒቨርሲቲ የትምህርትና የባህርይ ጥናት ኮሌጅ ሳይኮሎጂ ትምህርት ቤት ዋና ተመራማሪ በሆኑት ዶ/ር አሳምን አሳፋው የጥናት ዋና ዓላማ በአዲስ አበባ ከተማ በሚሊሊላንድ ጠፍ ጣቢያ ወስጥ የስኳር ህመም ክትትል በሚያደርጉት የስኳር ህመምተኞች ያለውን የድባቴ ደረጃ እና ተያያዝነት ያላቸውን ምክንያቶች ለማ ምገ ምነ ው። እርስዎ እና ሌሎች በዚህ ጥናት ወስጥ በፈቃደኝነት እንዲሳተፉ እጠይቃለሁ እና ከሁሉም የሚበቀውከአስራ አምስት እስከ ሃያ ደቂቃዎች የሚወስዱትን አንዳንድ ጥያቄዎችን መመለስ ነው። የእርስዎ እውነተኛ የታማኝነት ተሳትፎ ለተሻለ የጠፍ ፕሮግራም ዲዛይን እና የጠፍ አገልግሎት መሻሻል የሚገለግል መረጃ ለማመንጨት አስተዋፅዖ ያደርጋል ይህም ድባቴ ነፃ የሆኑ ቀናትን ለማሻሻል ይረዳል:: ከዚያም የህይወት ጥራትን ለማሻሻል አስፈላጊ ነውሆኖም የእርስዎ ተሳትፎ ሙሉ በሙሉ በፈቃደኝነት ላይ የተመሰረተ ነውእናም በጥናቱ ላይ የመሳተፍ ግዴታ የለብዎ። ያቀረቡት ወሂብ በዋናውመርማሪ የተሞላወን ኮድ ቁጥር ብቻ በማጠቀም እና ወሂቡን በመቆለፍ በጣም ሚስጥራዊ በሆነ መንገድ ይቀመጣል እና የትኛውም የግል መለያዎች ማጠይቁ ላይ አይኖሩም። በዚህ ጥናት ወስጥ ከመሳተፍ ጋር የተያያዘ ምንምዓይነት አደጋ የለም. በጥናት ላይ ምቾት ካልተሰማዎት በፈለጉት ጊዜ መተውመበትዎ ነው።

ስለ ጥናቱ ማንኛውም ጥያቄ ካለዎት ዋና ተመራማሪወን ዶ/ር አሳምን አሳፋው በሚከተሉት አድራሻዎች ሚለትም ስልክ: +251-912022155 / 926309574

ወይምኢ-ሜይል : assamin4@gmail.com ማግኘት ይችላሉ።

ሁኔታAnnex III :አባሪ III፡ ማጠይቆች (የአማርኛ ቅጂ)

የዲፕሬሽን ደረጃ እና ተያያዥነት ያላቸውን ጎልማሳ የስኳር ህመምተኞች በሚሊላንድ ጠፍ ጣቢያ፣ አዲስ አበባ፣ ኢትዮጵያ፣ 2023 ለማ ምን ምያለመለጥናቱ ሚጀ ለማነብሰብ የተዘጋጀ ማጠይቅ።

ወድ ተሳታፊ፣

♣ ለዚህ ማጠይቅ ሚልስ ስለሰጠኝ ትብብር ላማነግናችሁ እወዳለሁ።

♣ ጥያቄዎቹን በትክክል እና በታማኝነት እንዲሚልሱ በአክብሮት እንጠይቃለን ይህም ትክክለኛ ምላሾችዎ በጣም ጠቃሚእና የጥናቱ ወጠት ግምት ወስጥ በሚገባት ላይ ተጽእኖ ያሳድራሉ.

♣ ስምዎን መጻፍ አያስፈልግምእና ይልቁንስ ምላሽዎ በሚስጥር እንዲቆይ ኮድ ቁጥር እንጠቀማለን።

ወድ ሚጀ ሰብሳቢ

♣ ባዶ ቦታ ላይ በተጠቀሰውቦታ ከበብ በሚድረግ የ ሚሞላሉ ብዙ ምርጫጥያቄዎች አሉ።

ማጠይቁን ለመመላት ጊዜ ስለወሰዱ ሁላችሁንምአማነግናለሁ!

ክፍል 1: ማህበራዊ እና ኢኮኖሚያዊ የሚከይቁ ጥያቄዎች፡

	የ ጥያቄ ምድቦች ኮድ	Coding Categories	Code
101	ዕድሜ----- ዓመታት	---------ዓመታት	
102	ፆታ	1. ወንድ 2. ሴት	
103	ሀይማኖት	1. ሙስሊም 2. አርቶዶክስ 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ (ይግለጹ) ------	
104	አሁን ያለውየ ትዳር ሁኔታ	1. ያላገባ 2. ያገባ 3 የ ተፋቱ 4. ባል የ ሞተባት	
105	የ ትምህርት ደረጃ	1. ንበብ እና መፃፍ የሚችል 2. ማንበብ እና መፃፍ 3. 1-8 ክፍል 4. 9-12 ክፍል 5. የ ኮሌጅ/የ ዩኒቨርሲቲ ተመራቂ	
106	የ ስራ ሁኔታ	1. የ ቤት ሚስት 2. የ መንግስት ሰራተኛ 3. የ ግል ሰራተኛ 4. ነጋዴ 5. የ ቀን ሰራተኛ 6. ተማሪ 7. ሌላ (ይግለጹ) ----------	
107	የ ኑሮ ሁኔታ	1. የ ራሱ ቤት 2. ከራይ	,
108	የ ቤተሰቡ አማካይ ወርሃዊ ገቢ ስንት ነ ው? [በኢቲቢ]	1. < 2500 2. 12501-5000 3. >5005	

ክፍል 2፡ የህክምና እና የአኗኗር ዘይቤ / ከባህሪ ጋር የተያያዙ ምክንያቶች

201	*የስኳር በሽታ አንዳለቦት ከታወቀ ስንት ጊዜ ሆነ ወ? በአመታት)*	----------*አመታት*	
202	*የስኳር በሽታ መጭሃኒት መወሰድ ከጀመሩ ስንት ዓመት ነ ወ?*	----------*አመታት*	
203	*የሚታወቅ የስኳር በሽታ ያለውየቤተሰብአባል አለ?*	1. አዎ 2. የለም 3. አላወቅም	
204	*የሚታወቅ የስኳር በሽታ ያለውየቤተሰብአባል አለ?*	1. አዎ 2. የለም	
205	*ከስኳር በሽታ ጋር በተያያዘ ወሰብሰብ የጠፍ ችግር ምክንያት ጠፍ ተቋም ላይ አልጋ ይዘውሎተኝተውያወቃሉ?*	1. አዎ 2. የለም	
205*1)	አዎ ከሆነ ፣ ወስብስቦቹ (ዎች) ምንድናቸው	1.አጣዳፊ ችግሮች (DKA/HHS) 2. የአይን በሽታ/ ሬቲኖፓቲ 3. ተያያዥየ ነ ርቭበሽታ 4.ተያያዥየ ኩላሊትበሽታ 5. የ ወሲብ ስሜት መቀነ ስ 6. የስኳር በሽታ የእግር ቁስለት 7. ሌሎች (ይግለጹ ------	
206	*ሌላ ተጓዳኝ/ተዛማች ህመምአለብዎት*	1. አዎ 2. የለም 3. አላወቅም	
206*1*	206*1* ለ Q 206 አዎ ከሆነ ፣ ምን አይነ ት ምርቶች አሉዎት?	1. የደምግፊት 2. የ ጮማመበዛ ት 2. የልብእና ተያያዥበሽታ 4. ሌላ ከተገ ለጸ፡	
207	*በቤተሰባችሁ ወስጥ የአእምሮ ህመም ያለበት አለ?*	1. አዎ 2. የለም	
208	*የ ጫት አጠቃቀምሁኔታ*	1. አዎ 2. የለም	
219	*የአልኮል አጠቃቀምሁኔታ*	1. አዎ 2. የለም	
210	*የሲጋራ ሜጨስ ሁኔታ*	1. አዎ 2. የለም	

ክፍል 3፡ የጠፍ ተቋምእና አገልግሎት ሰጪዎች ተያያዥነ ት ያላቸውነ ገሮች

ተራ ቁጥር	ጥያቄዎች	Coding Categories	Code
301	ወደ ጠፍ ጣቢያ ለመሄድ ምን አይነት መጓጓዣ ይጠቀማሉ?	1. በእግር 2. በባጃጅ 2. በአውቶቡስ/ታክሲ 4. ሌላ ከሆነ ፡ -	
302	በጠፍ አገልግሎት አሰጣጥ ወቅት ችግሮች አጋጥመውዎታል?	1. አዎ 2. የለም	
303	በአገልግሎት አሰጣጥ ወቅት ምክር እና የስኳር ህመምትምህርት አግኝተዋል?	1. አዎ 2. የለም	
304	የስኳር ህመመድሃኒቱን እንዴት ያገኛሉ?	1. ጥሬ ገንዘብ / ክፍያ 2. CBHI 3. ከክፍያ ነጻ	
305	በጠፍ አገልግሎት አሰጣጥ ወቅት በጠፍ ጣቢያ ወስጥ ችግሮች አጋጥመውዎት ያውቃሉ?	1. አዎ 2. የለም	የለምከሆነ ፣ ወደ ክፍል IV ይዝለሉ

ክፍል 4፡ የደምስኳርመጠን (የሶስት ወር ሁኔታ)

	የደምስኳር መጠን	መጠን	ምርመራ
401	የ1ኛ ወር FBS		
402	የ2ኛ ወር FBS		
403	የ**3**ኛ ወር FBS		

ክፍል 5፡ የድባቴ ደረጃ ለመ ምን ምየ ሚጠይቁ ጥያቄዎች፡ በታካሚየ ጠፍ ጣቢይቅ (PHQ-9 ልኬት) ይለካሉ

10.	ጥያቄዎች ምድቦች				Code
	ባለፉት 2 ሳምንታት፣	በጭራሽ	ብዙ ቀናት	ከግማሽ ቀናት በላይ	በየ ቀኑ ሚለት ይቻላል
		0	**1**	**2**	**3**
501	*በፍላጎት ማጣት ምን ያህል ጊዜ አስቸግረዎታል?*				
502	*በድብርት፣ በጭንቀት ወይም በተስፋ መቁረጥ ስሜት ምን ያህል ጊዜ አስቸግሮዎታል*				
503	*ለመኖት መቸገር፣ ወይም ብዙ በመኖት ምን ያህል ጊዜ አስቸግሮዎታል*				
504	*የ ድካም ስሜት ወይም በትንሽ ጉልበት ምን ያህል ጊዜ አስቸግሮዎታል*				
505	*የ ምግብ ፍላጎት መቀነስ ወይም ከማጠን በላይ በመበላት ምን ያህል ጊዜ አስቸግሮዎታል*				
506	*ስለራስዎ መጥፎ ስሜት በማማዙ ወይም እርስዎ ያልተሳካልዎ ወይም እራስዎን ወይም ቤተሰብዎን ያሳጡበመሆኖ ምን ያህል ጊዜ አስጨቆቀዋል*				
507	*ጋዜጣ የማንበብ ወይም ቴሌቪዥን በመሳከት ባሉ ነገሮች ላይ ትኩረት የማጣት ችግር ምን ያህል ጊዜ አስጨቆዎታል?*				
508	*ሌሎች ሰዎች ሊገነዘቡት በሚችሉት በመቀሳቀስ ወይም በቀስታበመናገር ምን ያህል ጊዜ አስቸግረዋል*				
509	*ብሞት ይሻላል ወይምእራስህን በሆነ መንገድ ብትጎዳይሻልሃል በሚል ሃሳቦች ምን ያህል ጊዜ አስቸግረሃል*				

	ጠቅላላ ነጥብ				

የጥያቄአችን ማጠቃለያ ይህ ነው።

ለእነዚህ ጥያቄዎች መልስ ለማጠናቀቅ ጊዜ ስለወሰድክ እና ለእርዳታዎ እናመሰግናለን።

የመረጃ ሰብሳቢ ስም----------

ፊርማ---------- ቀን----------