PREVALENCE AND FACTORS ASSOCIATED WITH DEPRESSIVE SYMPTOMS AMONG PEOPLE LIVING WITH HIV IN MOSHI MUNICIPALITY, TANZANIA.

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PREVALENCE AND FACTORS ASSOCIATED WITH DEPRESSIVE SYMPTOMS AMONG PEOPLE LIVING WITH HIV IN MOSHI MUNICIPALITY, TANZANIA.

By

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A Dissertation Submitted in (Partial) Fulfilment of the Requirements for the Degree of Master of Medicine in Psychiatry

Muhimbili University of Health and Allied Sciences

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CERTIFICATION

The undersigned certifies that she/he has read and at this moment, recommends for accepts in by the Muhimbili University of Health and Allied Sciences a dissertation entitled: **"Prevalence and Factors associated with depressive symptoms among people living with HIV in Moshi Municipality, Tanzania**" in (Partial) fulfillment of the requirement for the degree of Master of Medicine (Psychiatry) of the Muhimbili University of Health and Allied Sciences.

…….

Dr. Ester Steven (MD,MMED)

(Supervisor)

Date:……

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Dr. Dorothy Mushi (MD,MMED)

(Co-supervisor)

Date:……

DECLARATION AND COPYRIGHT

I, Neema Allen Ng'unda, declare that this dissertation is my original work. It has not been presented and will not be presented to any University for a similar or any other degree award.

Signature …….. Date……..

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DEDICATION

I dedicate this work to my cherished family, my parents Mr. and Mrs. Allen O. Ng'unda, and my younger sisters Anna and Angel. Their unwavering encouragement and support have been my pillars throughout my years of study.

ABSTRACT

Background: Depression is a common mental disorder accounting for 3.8% disability worldwide; and 38% in East Africa. There is an increase in the prevalence of depressive symptoms in people living with Human Immunodeficiency Virus (HIV) than in the general population which may impair adherence to treatment and quality of life. The use of ART has increased the life span of People living with HIV (PLWH) thus they grow to old age and increase the risk of diabetes. There are biological and psychosocial factors associated with depressive symptoms in PLWH. Therefore, this study determined the prevalence and factors associated with depressive symptoms among people living with HIV in Moshi Municipality, Tanzania.

Objective: The study determined the prevalence and factors associated with depressive symptoms among people living with HIV in Moshi Municipality, Tanzania.

Methodology: A cross-sectional analytical study was conducted among People living with HIV (PLWH) using a multistage systematic sampling technique in selecting study participants. A structured social demographic questionnaire, DUKE-UNC Functional Social Support Questionnaire to measure social support, a Patient health questionnaire (PHQ-9), a brief copying scale, glycated hemoglobin (HBA1c) tools, and patient medical report were used in collecting data. Data were entered and analyzed using STATA version 16. Descriptive data were described using the mean as well as standard deviation. Bivariate and multivariate logistic regression were done and adjusted for intra-cluster of outcome to assess the association between the independent and dependent variables with a statistical significance p-value<0.05. Data collection was between September to October 2023.

Results: A total of 598 clients participated in this study from four care and treatment Clinics (CTCs) in three health facility levels with just above half (56%) from the secondary health facility level. Almost three-quarters (70.9%) of the participants were female. The Prevalence of depressive symptoms was 14% (N=86). Factors associated with depressive symptoms were, secondary health facility AOR 1.28(95% Cl:1.14-1.76), family history of mental illness AOR 2.91(95% Cl:1.58-5.37, good social support AOR 11.11(95% Cl: 2.61-17.1), average social

support AOR 5.44 (95% Cl:1.81-7.38)and higher maladaptive copes AOR 4.57(95% Cl:3.32-6.30).

Conclusion: The prevalence of depressive symptoms among PLWH is more common as **one in** seven reported depressive symptoms. The study shows attending a secondary health facility, the presence of a history of mental illness in the family, good and average social support, and maladaptive coping mechanisms were associated with depressive symptoms among People Living with HIV.

Recommendations: From this study improving mental health care, especially in secondary health facilities by increasing resources, Strengthening social support systems and addressing maladaptive coping mechanisms for people living with HIV will help to reduce depressive symptoms among people living with HIV.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral therapies
CRP	C-reactive protein
CTC	Care and treatment center
DM	Diabetes Mellitus
HBA1C	Glycated Hemoglobin
HIV	Human Immunodeficiency Virus
HPA	Hypothalamic-pituitary-adrenal
FSSQ	Functional Social Support Questionnaire
PHQ-9	Patient Health Questionnaire 9
PLWH	People living with HIV
STATA	Statistical Software for Social Science
WHO	World Health Organization

DEFINITION OF TERMS

Acquired Immunodeficiency Syndrome (AIDS) is a severe form of HIV (HIV.gov. HIV/AIDS Basics. 2020).

Depression is a mood disorder with a sad mood or loss of interest, weight gain or loss, decrease in appetite, hypersomnia or insomnia, low concentration, feelings of guilt, and suicidality that impair the level of function (DSM 5 TR, 2022).

Depressive symptoms encompass a cluster of emotional, cognitive, and physical manifestations that can arise in diverse mental health conditions, not limited to depression. These symptoms can manifest temporarily and may exhibit varying degrees of intensity (DSM 5 TR, 2022).

Diabetes mellitus is a chronic non-communicable disease that occurs when there are raised levels of glucose in the blood because the body cannot produce any or enough of the hormone insulin or use insulin effectively (IDF, 2017).

Human Immunodeficiency Virus (HIV) is a virus that attacks and lowers the body's immunity, predisposing it to further infections and diseases (HIV.gov. HIV/AIDS Basics. 2020).

Prediabetes is defined as blood glucose levels that do not meet the criteria for diabetes but are higher than normal (American Diabetes Association, 2018).

People living with HIV are people diagnosed to have HIV and can either be children or adults. This study is an adult population (OAR - HIVinfo & Info, 2021).

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Depression is a mental disorder affecting approximately 280 million people globally, accounting for 3.8% of the general world population, with 5.0% in adults (WHO,2021). The prevalence of depression in Sub-Saharan Africa ranges from 32% (Bernard et al, 2017; Nakimuli-Mpungu et al, 2012) and 38% in East Africa (Ayano et al, 2018). There is an increased risk of depressive symptoms in people living with HIV (PLWH) than in the general population (Mekonen et al., 2021). The presence of depression, alcohol use, and comorbidity of other chronic illnesses such as diabetes mellitus and hypertension, decreases the quality of life in PLWH (Millar et al., 2017).

Worldwide, approximately 39.9 million people are living with HIV, and about 30.7 million people were receiving antiretrovirals (ART) by 2023, approximately 26 million people were living with HIV in Africa, and approximately 21.3 million people were receiving ART by 2023(WHO, 2024). In Tanzania, the prevalence of HIV was 4.4% in ages 15-49 year and about 5.6% in women and 3.0% in men, about 4.0% in Kilimanjaro region by 2023(NBS, 2023)

Antiretroviral therapies (ART) is widespread in many areas, with 76% coverage worldwide and 78% in Africa (Unaids, 2022). This has increased the life span of PLWH. Thus, they grow to their old age, and prolonged exposure to ARTs increases the risk of having diabetes in PLWH. (Fiseha & Belete, 2019; Kubiak et al, 2021; Slama et al, 2021; Umar & Naidoo, 2021). However, nonadherence to ART may be due to alcohol use, which may contribute to poor disease outcomes (Velloza et al., 2020).

PLWH have a higher rate of depressive symptoms than the general population due to perceived HIV stigma (Hémar et al, 2022), poor economic status, low social support, being female, being less educated, and substance use(Bernard et al, 2017), comorbid chronic illness(Necho et al., 2021), and older age (Mwangala et al., 2022). Depressive symptoms in PLWH reduce adherence to ARTs, which lowers the quality of life (Cai et al, 2020) and increases mortality and morbidity (Qubekile et al, 2022)

There are limited studies in Tanzania about the Prevalence and factors associated with depressive symptoms among people living with HIV. So, this study will determine the Prevalence and factors associated with depressive symptoms among people living with HIV in Moshi Municipality, Tanzania.

1.2 Problem Statement

Worldwide, the prevalence of depression in PLWH is 31% (Rezaei et al., 2019). A study done in Dar-es-Salaam, a major commercial seaport city in Tanzania, showed the prevalence of depression among PLWH attending CTC is 9.6% (Lukumay et al, 2022). The prevalence of depressive symptoms is higher in PLWH compared to the general population (Bernard et al, 2017). This is due to perceived HIV stigma (Hémar et al, 2022), employment, low social support, female, low education level, alcohol use (Bernard et al, 2017), and coping with HIV-related stress (Kaneez, 2016) and chronic illness such as diabetes (Hernandez et al, 2018).

Depressive symptoms in PLWH are associated with non-adherence to ARTs (Belenky et al, 2014) which affects the prognosis of HIV treatment. Depressive symptoms in PLWH increase the risk of suicide compared to the general population (Kinyanda et al, 2012), suppression of immunity, and increase co-morbidity with other chronic conditions such as diabetes (Hernandez et al, 2018). The comorbidity of depression and diabetes leads to poor ART adherence, which worsens the quality of life (Cai et al, 2020) and death (Jespersen et al, 2021) in PLWH.

However, the overlap of somatic symptoms between HIV and depressive symptoms leads to under-recognized depressive symptoms, hence under-treating among PLWH, which affects the HIV treatment plan (Kulisewa et al., 2019), thus increasing the risk of death, morbidity, and reduced quality of life (Kinyanda et al., 2012; Nyongesa et al., 2018).

There is a scarcity of studies on the prevalence and factors associated with depressive symptoms among PLWH in Tanzania. Therefore, this study aimed to determine the prevalence and factors associated with depressive symptoms among people living with HIV in Moshi municipality, Tanzania.

1.3 Conceptual Framework

The Biopsychosocial model is a model that shows the interconnection and reciprocal influence of biological, psychological, and social factors in disease causation and treatment (Borell-Carrió et al., 2004). It was first proposed by a scientist and physician, George Engel, in 1997 (Engel, 1997) in the United States. Engel argued that understanding health and illness requires an integrated approach that considers all three aspects instead of focusing on only one (Bolton & Gillett, 2019). Healthcare professionals can better comprehend the complexity of diseases and develop more holistic approaches to diagnosis, treatment, and patient care (Card, 2022). The model has been used and studied for many years by various scientists and clinicians in different diseases such as chronic pain (Miaskowski et al., 2020), cardiovascular diseases (Bolton & Gillett, 2019), and Mental illness (Tripathi et al., 2019). The occurrence of Mental illness is determined by biological, psychological, and social factors in an individual, particularly when mental health status changes in a manner that causes illness (Theofilou, 2011).

The conceptual framework for this study was adapted from the Biopsychosocial model that showed the interaction of biological factors like age, sex, family history of mental illness, Diabetes, and substance use and psychosocial factors like HIV perceived stigma, perceived social support, coping with HIV related stress, marital status, level of education and employment in developing depressive symptoms and how they are interlinked in coining depressive symptoms among People living with HIV.

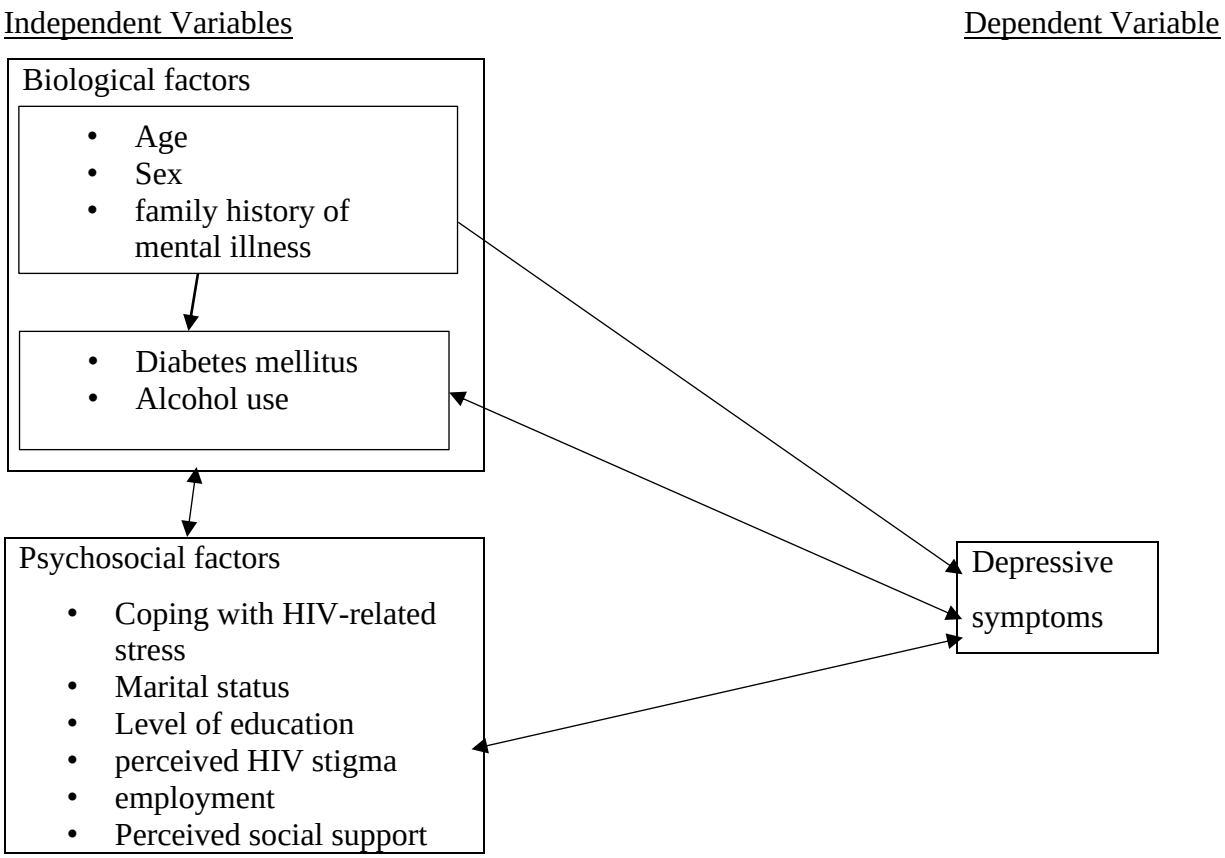


Figure 1: Adapted Biopsychosocial model illustrating factors associated with depressive symptoms among people living with HIV.

1.4 Rationale of the Study

The study aimed to build knowledge on the prevalence and factors associated with depressive symptoms among PLWH. Therefore, helping by informing hospitals of the need for screening and intervention of depressive symptoms among PLWH. Additionally, the findings will provide insight into training healthcare workers, informing health policies, and addressing mental health care among PLWH in Tanzania. Doing this study is part of my fulfillment for a master's degree in psychiatry.

1.5 Research Questions

1.5.1 General Research Question

- What **is** the prevalence and factors associated with depressive symptoms among people living with HIV in Moshi Municipality, Tanzania?

1.5.2 Specific Research Questions

1. What is the prevalence of depressive symptoms among people living with HIV in Moshi Municipality, Tanzania?
2. What are the factors associated with depressive symptoms among people living with HIV in Moshi Municipality, Tanzania?

1.6 Research Hypothesis

1.6.1 Null Hypothesis

1. There is no association between depressive symptoms and biopsychosocial factors among people living with HIV

1.6.2 Alternative Hypothesis

1. There is an association between depressive symptoms and biopsychosocial factors among people living with HIV

1.7 Study Objectives

1.7.1 Broad Objective

To determine the prevalence and factors associated with depressive symptoms among people living with HIV in Moshi Municipality, Tanzania.

1.7.2 Specific Objectives

1. To determine the prevalence of depressive symptoms among people living with HIV in Moshi Municipality, Tanzania.
2. To determine the factors associated with depressive symptoms among people living with HIV in Moshi Municipality, Tanzania.

CHAPTER TWO

2.0 LITERATURE REVIEW

The prevalence of mental problems in HIV-infected individuals is significantly higher than that of the general population (Mekonen et al., 2021). There are biological and psychosocial factors associated with depressive symptoms among PLWH (Necho et al., 2021; Zewudie et al., 2021). Therefore, this chapter outlines various literature reviewed on the prevalence and factors associated with depressive symptoms among people living with HIV in Moshi Municipality, Tanzania. It has been structured based on the specific objectives of the proposed study as follows.

2.1. Prevalence Of Depressive Symptoms Among People Living With HIV

A systematic review study done on the global burden of depressive symptoms and major depression in individuals living with HIV/AIDs shows the prevalence of depressive symptoms to be 34.17%, which ranges from 19% in sub-Saharan Africa to 50.8% in China (Necho et al., 2022). The studies done in Asia showed that China had a prevalence of depressive symptoms among HIV/AIDs to be 6.73%, for mild depressive symptoms, moderate, moderate to severe, and severe depressive symptoms prevalence was 4.0%, 1.65%, 0.76%, and 0.35 respectively (Chen et al., 2022) and Oman prevalence of depressive symptoms is 41.6% in people living with HIV (Madhani et al., 2020).

The prevalence of depression among patients with HIV/AIDS in most developed countries is as follows: 13.74% in the USA (L. M. Adams et al., 2018) and 11.45% in Canada (Aljassem et al., 2016). The studies done in France and Ukraine, in which the prevalence rates of depression were about 28.1% and 26%, respectively (Bailey et al., 2016; Feuillet et al., 2017), low prevalence rates of depression in these countries could be attributed to governmental support for these patients, people's social and cultural awareness, as well as advancements in health status (Rezaei et al., 2019).

Studies done in Africa have shown depression among PLWH in African countries to range from 9 to 32%, with moderate to severe depression being 24.4% (Bernard et al., 2017; Patel et al., 2018). Systematic review studies done in Ethiopia showed pooled depression prevalence nationally in 2021 to be 36.3% (Zewudie et al., 2021). that is almost similar to 36.65% of that done in 2015(Amare et al., 2018), which is high compared to a single study done in May 2015 (Beyene Gebrezgiabher et al., 2019).

A systematic review done in East Africa on the prevalence of depression in PLWH was 30.88% in Uganda, 49.79% in Ethiopia, Kenya, Tanzania, Rwanda, and Sudan only one study from each country was found with the prevalence of 47.25%,2%,81% 61.3% respectively. (Ayano et al., 2018) in East Africa. A systematic review and meta-analysis estimated that the overall prevalence of major depressive disorder among PLH in Tanzania was 12.7% (Lofgren et al., 2020).

Comparatively, little is known about the prevalence of depressive symptoms and its associated factors among PLWH in Tanzania, somewhat due to a scarcity of studies in Tanzania concentrating on the prevalence of depressive symptoms among PLWH. Therefore, I seek to fill this gap by determining the prevalence of depressive symptoms among PLWH in the Moshi municipality, Tanzania.

2.2 Factors Associated With Depressive Symptoms Among People Living With HIV

There is a bidirectional relationship between HIV/AIDS and depressive symptoms, which can be explained by HPA- Axis(WHO, 2016), which means HIV/AIDS increases the risk of probable depressive symptoms and vice versa. A synthesized review of the factors associated with depressive symptoms among PLWH from the literature is outlined in this section. These factors can be grouped into biological factors and psychosocial factors as follows.

2.2.1 Biological factors associated with depressive symptoms among people living with HIV

Age

Old age has been associated with higher odds of depressive symptoms (Mwangala et al., 2022). The severity of depressive symptoms could be related to age (Asangbeh et al., 2016), and depressive symptoms have been shown to increase with the age of 40 years and above. (Aljassem et al., 2016). Little is known about the effect of age on depressive symptoms among PLWH in either Tanzania or East Africa as a whole.

Sex

Studies have shown different associations between sex and depressive symptoms as follows: women are more prone to depressive symptoms compared to males (Algoodkar et al., 2017; Oko et al., 2019; Seth et al., 2014). Other studies show no significant association between depressive symptoms and being female(Amare et al., 2018) and that the prevalence rate of depression appears to be higher in men than in women (R. Khan et al., 2018; Kinyanda et al., 2017). Not much is known about sex as a risk factor for depressive symptoms among PLWH in Tanzania, hence the need for a better understanding of sex differentials in the presence of significant depressive symptoms among PLWH accessing services.

Family history of mental illness

A family history of mental illness is associated with depressive symptoms about two times compared to those who do not have (Al Balawi et al., 2019; Kinyanda et al., 2011). There is an increased chance of depression in children of parents with depression compared to their grandchildren (Weissman et al., 2016). Little is known about the association of family history of mental illness with depressive symptoms among PLWH in Tanzania. Hence, this study finds an association among PLWH.

Diabetes Mellitus

Depressive symptoms in PLWH have been associated with co-morbid chronic illnesses such as diabetes mellitus (Necho et al., 2021). People with Diabetes have 2-4 times the chance of being depressed compared to people without diabetes (Bayani et al., 2022). Having diabetes for more than 20 years and high perceived stress has been associated with an increased chance of being depressed (Jeong, 2021). However, few studies have explored the associations between depressive symptoms and diabetes among PLWH in Tanzania, hence the need to determine this association in this study.

Alcohol Use

Use of alcohol has been associated with depression among PLWH as using alcohol makes them frequently forget to take ARTs at the right time and dose due to the effect of alcohol on the brain and fear of overdose (Basha et al., 2019a) others use alcohol as a way of coping with stress. However, limited studies have explored associations between depressive symptoms and alcohol use in PLWH in Tanzania, hence the need to determine this association in this study.

2.2.2 Psychosocial factors associated with depressive symptoms among people living with HIV

Coping with HIV-related stress

PLWH uses different coping strategies to cope with the stresses of having HIV. Females have higher levels of adaptive coping than males (Ataro et al., 2020). Maladaptive copying, avoidant coping (Parcesepe et al., 2023), behavioral disengagement, and denial (Ataro et al., 2020) have been associated with depression, whereas acceptance (Ataro et al., 2020), emotional support, and religion have been protective against depression (Obadiah Dyages et al., 2019). However, few studies in Tanzania have been done on coping strategies among PLWH hence, this study aimed to add a better understanding of associations between coping mechanisms and depressive symptoms among PLWH to inform coping interventions better.

Perceived HIV stigma

People living with HIV/AIDS are more likely to have depressive symptoms as they fear gossip from others, feel stigmatized by the community, and isolate themselves (Amare et al., 2018; Zewudie et al., 2021). HIV-related stigma was significantly associated with higher odds of depressive symptoms among adults with HIV (Mwangala et al., 2022). The presence of a perceived HIV stigma increases the probability of developing depressive symptoms by 3.8 times (Endeshaw et al., 2014; Necho et al., 2021). There is limited literature on the associations between perceived stigma and depressive symptoms among PLWH in Tanzania. Hence this study determined the association between perceived social stigma and depressive symptoms among PLWH in Moshi Municipal, Tanzania.

Social support

Family and social support are important in PLWH to provide warmth, care, and economic and social stability thus decreasing the stresses faced by the patient (Bhatia & Munjal, 2014a). Lack of family support is said to be associated with depression (Algoodkar et al., 2017). There is a higher prevalence of depression about 77.8% of those without family support (Oko et al., 2019). PLWH are three times more likely to have depressive symptoms if they get poor support from the community (Amare et al., 2018; Zewudie et al., 2021), poor social support systems increase the risk of developing depressive symptoms by 6.2 times compared with good support system (Necho et al., 2021). There is limited literature on the associations between social support and depressive symptoms among PLWH in Tanzania. Hence this study determined the association between social support and depressive symptoms among PLWH in Moshi Municipal, Tanzania.

Marital status

Being widowed increases the chance four more times to have depressive symptoms in PLWH as the loss of a partner and unstable marriage predispose to loneliness and sadness (Oko et al., 2019; Zewudie et al., 2021). likewise living alone may be the reason people not sharing their problems hence so much stress (Amare et al., 2018). Those who are divorced or widowed/widowed are more depressed as they have more to deal with the stresses of taking care of the children and families at the same time to face the stigma from society (Bhatia & Munjal, 2014). In Tanzania, little is known about the associations between depressive symptoms and marital status among PLWH. Therefore, the study determined the association between marital status and depressive symptoms among PLWH in Moshi Municipal.

Employment status

Economic insecurity may lead to frustrations, stress, dysfunctional family, and feelings of worthlessness thus prone to depression as shown in different studies that are a direct relationship between unemployment and depression in PLWH (Bhatia & Munjal, 2014; Oko et al., 2019). Unemployed PLWH could have a 3-fold risk of severe depressive symptoms (Kitshoff et al, 2012). Little is known about the association between employment status and depressive symptoms among PLWH accessing CTC services. Therefore, this study aimed to determine the association of employment status with depressive symptoms among PLWH in Moshi Municipal.

Level of education

Level of education contribution to depressive symptoms. A higher prevalence of depression is higher in people who have low education and are uneducated (Bhatia & Munjal, 2014; Oko et al., 2019). PLWH with no more than primary school education seemed to have nearly a 2-fold risk of having more depressive symptoms (Kitshoff et al., 2012).Little is known about the association between education level and depressive symptoms among PLWH attending CTC. Hence, this study aimed to determine the association of level of education with depressive symptoms among PLWH in Moshi Municipal.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Design

This study was a hospital-based quantitative cross-sectional design. The reason was many African studies of significant depression or depressive symptoms and its associated factors among PLWH have been hospital-based and are cross-sectional studies (Mohamud et al., 2023; Opoku Agyemang et al., 2022; Seid et al., 2020).

3.2 Study Area And Setting

The study was done among CTC centers in Moshi Municipal Council, Kilimanjaro region. Moshi Municipal Council has an area of 58 square kilometers with a population of 221,733 people from the 1,861,934 Kilimanjaro Region(NBS, 2022). There were 19 CTCs in Moshi Municipal found in different levels of health facilities, one center was found at the tertiary hospital level, one center at the secondary hospital level, seventeen centers at the primary hospital level(1 in the district hospital, 6 centers health centers, and 10 centers were at the dispensary level). CTCs served in total 800-1,200 clients per week. The services provided at CTCs were integrated into all health facilities, from the higher tertiary care to the lower primary care levels (TDHS, 2022). The services were provided by trained medical staff. These included counseling and testing for HIV/AIDS, provision of awareness campaigns for HIV/AIDS testing and treatment, initiation of anti-retroviral therapy (ARTs), clinical management of opportunistic diseases, and psychosocial support (TDHS, 2022).The study sites were 4 CTCs purposively selected according to the proportion of clients attended from different facility levels, 1 center from KCMC zonal hospital as the tertiary level, 1 center from Mawenzi Regional Referral Hospital as the secondary level, and 2 health centers, Majengo and Pasua as primary level. CTCs were opened from Monday to Friday 8:00 am to 4:00 pm, except for Majengo which opened 3 days per week. The total coverage of clients in CTC were as follows, Majengo CTC has 1347 registered clients, Mawenzi 3883, Pasua 1083, and KCMC 2645 clients.

3.3 Study Population

The study population was adults aged 18 years and above who attended the CTC at Moshi Municipal and were on ARTs for at least six months as a person was considered stable(National Aids Control program, 2019).

3.4 Sample Size Calculation

The sample size was calculated based on a study done in Kilimanjaro, Tanzania, which had a prevalence of depression of 23% among PLWH (Lugata et al., 2020). The sample size was calculated based on the equation from Cochran's formula (chaokromthog, 2021)

$$N = \frac{Z^2 P (1-P)}{d^2}$$

Whereby:

N= estimated desired sample size

Z= confidence level at 95% (standard value of 1.96)

P= Prevalence of Depression among PLWH-23%

d= Margin of error at 5%

From the formula,

$$N=\frac{1.96^2*0.23(1-0.23)}{(0.05)^2}$$

$$N= 272$$

An adjustment was done by assuming a 10% non-response rate, then calculated which resulted in the sample size N = 302

Cluster sampling was used and adjusted for by using design effect (DEFF) (Alimohamadi & Sepandi, 2019) since it involved different levels of health facilities. The calculation was done by using the adjusted Intracluster Correlation (ICC) of 0.005 taken from a study done in primary care (Adams et al, 2004).

DEFF= 1+ ICC(m-1)

Whereby; m= average number of clients per cluster

from, DEFF= 1+ 0.005(75.5-1)

DEFF =1.372

Final sample size= N*DEFF

hence 302 x 1.372= 414

Therefore, after the adjustment for the design effect, the estimated minimum sample size was 414

The sample size was increased to 600 to increase the power of the study (Suresh & Chandrashekara, 2012)

3.5 Sampling Procedure

A multistage purposeful sampling procedure was used to select study sites and the proportion was used to select study participants from the sites based on the number of clients and needed sample size. Stage 1, purposely selecting CTCs available in Moshi Municipal. Selection of 4 CTCs from 19 centers available in Moshi Municipal depended on the level of facility and number of clients visited per day. This was as follows, 1 center from the tertiary level was selected that was Kilimanjaro Christian Medical Center (KCMC), a zonal hospital and 1 center from the secondary level was selected that was Mawenzi Regional Referral Hospital (MRRH) as the only facility available at the secondary level. Majengo Health Center and Pasua Health Center were the 2 centers that were selected from the primary level among 17 centers because they have higher daily client attendance compared to others.

From the municipal CTC2 database, 2,645, 3,883, 1,083, and 1,347 clients are registered at KCMC, MRRH, Pasua, and Majengo Health Centers, respectively. Stage 2, Selection of participants at the facility level. Upon receiving permission from the respective CTC to proceed with participant recruitment the total sample size was portioned depending on the total number of clients registered in each facility. Therefore, the site with the highest number of clients was assigned a greater number of participants from the overall sample, that was 260, 177, 90, and 73 at Mawenzi, KCMC, Majengo, and Pasua, respectively. The total number of clients

interviewed per day from all centers was obtained by dividing the total sample size by the number of days the sites were visited which is 20 days. The number of participants approached per single day in each center was obtained by, the total number of clients seen per day times the total number of days for sample collection divided by the sum of the number of clients seen per day in all centers which was the allocated as 9 from KCMC, 13 from Mawenzi, 4 from Pasua and 5 from Majengo enrollment per day. Potential study participants per day were identified through patient medical records at the respective CTC centers by systematically selecting a client through an interval that was obtained by dividing the total number of clients seen in that center by the total number of clients that were interviewed in each center, respectively.

3.6 Data Collection Procedure

Data collection was conducted by four researchers along with four trained medical staff or students serving as research assistants. Eligible participants who met the inclusion criteria underwent the process of informed consent and completed study surveys in a designated private research space. Those attending the clinic were approached and asked for consent to participate. The informed consent form and survey questions were verbally presented, with responses recorded on the form. Signed consent forms were stored separately from survey responses, accessible only to the researcher's post-collection. Patients who declined participation were thanked and continued with clinic services. Participants received an introduction to the study and its tools before proceeding to complete them, beginning with the socio-demographic questionnaire and then other tools. All instruments were consolidated into a single document and administered in Swahili. Upon completion, participants were thanked and assisted in navigating clinic services.

3.7 Data Collection Tools

The study involved the following variables: Depressive symptoms, age, sex, employment status, level of education, perceived social support, and diabetes. The tools used to measure these were as follows:

- Semi-structured social demographic questionnaire
- Patient Health Questionnaire 9 (PHQ-9)
- Duke-UNC Functional Social Support Questionnaire (FSSQ)
- Patient medical record
- Brief coping scale
- HIV/AIDS Stigma Instrument (HASI)
- Glycated hemoglobin (HBA1c)

3.7.1 Semi-structured Social Demographic Information Questionnaire

Each participant was given a socio-demographic questionnaire to gather a range of sociodemographic information. **This questionnaire was semistructured**, translated into Swahili from its original English version, and covered details such as age, educational level, sex, marital status, employment status, and family history of mental illness.

3.7.2 Patient Health Questionnaire 9 (PHQ-9)

The PHQ-9 is a versatile tool designed for screening, diagnosing, monitoring, and assessing the severity of depression (Kroenke et al., 2001). This questionnaire comprises nine questions probing the frequency of depressive symptoms experienced by participants over the past two weeks. Each statement allows for a score ranging from 0 to 3 (0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day), with a maximum total score of 27. Scores falling within certain ranges indicate different levels of depression severity: 20–27 for severe depression,15–19 for moderately severe depression, 10-14 for moderate depression, 5–9 for mild depression, and 0–4 for asymptomatic. Validation within the Tanzanian context yielded a Cronbach’s Alpha coefficient of 0.83 and cutoff points of 9 (Smith Fawzi et al., 2019).

Participants scoring 9 or higher were categorized as depressed, while those scoring below were considered non-depressed. The questionnaire was translated into Swahili, the most widely understood and spoken language in Tanzania from its original English version to aid participants' comprehension. It was administered by interviewers.

3.7.3 Duke-UNC Functional Social Support Questionnaire (FSSQ)

Duke-UNC Functional Social Support Questionnaire was developed to evaluate perceived social support (Broadhead et al., 1988). This scale consisted of 14 questions, showing emotional, material, physical/instrumental, and social aspects each scored on a five-point scale ranging from 1 to 5 (5= As much as I would like, 4= Almost as much as I would like, 3= Some but I would like more, 2= Less than I would like, 1= Much less than I would like). Higher scores indicate greater levels of social support. This study categorized scores into tertiles, between 14 and 23.3 as low perceived social support, 23.4 to 46.6 as average, and 46.7 to 70 as good. The scale has demonstrated good construct validity and reliability, as Cronbach's alpha is 0.87 (Mas-Expósito et al., 2013). The tool has not been validated in Tanzania however it has been used by other researchers among people living with HIV (Madundo et al., 2023).

3.7.4 Patient medical records

Details of HIV status were obtained from the CTC card to obtain details such as the date of HIV diagnosis, and the date of initiation of treatment.

3.7.5 Brief cope scale

The coping strategies of patients diagnosed with HIV were evaluated using the Brief Cope scale, which comprised 28 questions divided into 14 subscales. Participants rated each item on a 4-point scale ranging from 1= I usually do not do this at all, 2= I usually do this a little bit, 3= I usually do this a medium amount to 4= I usually do this a lot. The higher scores indicated greater utilization of a particular coping strategy. Adaptive coping strategies included active coping, planning, positive reframing, acceptance, humor, religion, and the use of emotional and instrumental support with a total score of 64. Maladaptive coping strategies encompassed self-distraction, denial, venting, substance use, behavioral disengagement, and self-blame with a

total score of 48. Scores for each strategy were categorized as either low or high, reflecting the extent to which individuals employed each coping method (Pavlova et al., 2022; Parcesepe et al., 2023). The tool had not been validated in Tanzania, forward and backward translation was done from English to Swahili then Swahili to English.

3.7.6 HIV/AIDS Stigma Instrument (HASI)

HIV-related stigma was evaluated using Berger's Stigma scale (Wanjala et al., 2021), which assessed personalized stigma, disclosure concerns, concerns regarding public attitudes, and negative self-image. The scale consisted of 12 items, each rated a scale of 1 for strongly disagree, 2 for disagree, 3 for agree, and 4 for strongly agree which gave a score range of 12-48. A cutoff score of 30 or higher indicated a presence of perceived HIV stigma, while a score below 30 indicated low perceived HIV stigma(Alemu et al., 2022). Validation of this scale was conducted in Tanzanian, demonstrating good construct validity and adequate reliability, with a Cronbach's alpha exceeding 0.70 (Holzemer et al., 2007 and Greeff et al., 2010).

3.7.7 Glycated Hemoglobin (HBA1c)

Diabetes was determined by HbA1c using a point-of-care device. The results were grouped into normal, prediabetes, and diabetes. Diabetes was defined by HbA1c ≥6.5%, Prediabetes was defined by HbA1c ≥5.7% to < 6.4%, and normal was defined by HbA1c 4% to 5.6%(American Diabetes Association, 2018). HbA1c became useful in clinical works and research due to fewer logistics although it's expensive and also useful in people with anemia even HIV (Hodel et al., 2020).

3.7.8 Variables

Independent Variables: Social demographic information, perceived social support, HIV-related stigma, Diabetes

Dependent Variables: Depressive symptoms

3.8 Sample Selection Criteria

3.8.1 Inclusion Criteria

1. Available patients at the time of data collection who were 18 years or older.
2. Patients diagnosed with HIV in the past 6 months.
3. Patients who provided informed consent through either signature or fingerprint mark for those who could not provide a signature indicated participation voluntarily.

3.8.2 Exclusion Criteria

1. Clients who were unable to participate either physically or verbally unable to express themselves.

3.9 Data Analysis

The data underwent input and processing via Statistical Software for Social Sciences (STATA) version 16. Variables were displayed in tables and figures, incorporating descriptive and inferential statistics for analysis. Categorical data were summarized using frequencies and percentages, while continuous variables were characterized by means and standard deviations. The association between independent and dependent variables was evaluated through bivariate and multivariate analyses, with statistical significance set at p-values below 0.05. Factors identified in the bivariate analysis with a p-value below 0.25 were further scrutinized for potential confounding effects on depressive symptoms in multivariate logistic regression analysis, yielding adjusted odds ratios (AOR), with significance determined at p-value less than 0.05 and confidence intervals set at 95%. Weight analysis and clustering by site were done to account for unequal selection probabilities and design effects in both bivariate and multivariate analysis.

3.10 Pre-Testing of Data Collection Tools

Pilots for the tool were conducted by interviewing eight clients, with two participants selected from each CTC. This was done by both the researcher and the RA, aiding in understanding the questionnaire before its administration to the participants.

3.11 Recruitment and Training of Research Assistants

Eight research assistants were recruited to assist in the data collection process. These assistants were both University graduates with years of experience in research, particularly related to mental health, public health fields and laboratories. Training the RAs on the study procedures and research instruments was done one week before the start of the data collection process.

The RAs were trained on informed consent procedures, how to administer the questionnaires, and ethical issues. The researcher and RAs did both sampling and data collection. HBA1c was measured in the laboratory by a lab technician involved in the study.

3.12 Ethical Issues and Research Clearance

Approval to conduct this study was obtained from the MUHAS Senate Research and Publications Committee. Additionally, permission was sought from the RMO Kilimanjaro, Medical Officers in Charge at the KCMC, Mawenzi Regional Referral Hospital, Majengo, and Pasua Health Center, as well as the Officers in Charge at their respective CTC clinics, providing them with detailed information about the study. The consent form explicitly outlined the study's purpose and emphasized the study's potential benefits and risks, including no financial benefit to the participants. Contaminated needles, gauze, and gloves were disposed of safely.

Participants who scored high on the PHQ-9 questionnaire and question number 9, which relates to self-harm, were informed about the inference from this score and then referred for appropriate mental health intervention in the Psychiatry department at either KCMC or Mawenzi as communicated during the process of obtaining consent. Participants were informed of their diabetic status, and those who were found with HbA1c > 5.7% were referred for treatment in the Diabetic clinic.

They were also given the contact information of the researcher, the supervisor, and the Director of Research and Publication Committee from MUHAS in case they had any questions, concerns, or complaints. The KCMC-Duke Collaboration and KCRI funded this study through the D43-TW009595 Grant. However, the funders did not influence the project approach and results.

CHAPTER FOUR

4.0 RESULTS

Chapter **four** shows the results as analyzed from the collected data. It shows the findings regarding the prevalence of depressive symptoms and associated factors among PLWH in Moshi Municipal. This research involved 598 participants, with a 100% response rate among those enrolled in CTCs.

4.1 Description of Socio-demographic and Clinical Characteristics of the Study Participants

A total of 598 clients from three health facilities participated in this study. Among these participants, just over half (56%) came from the Secondary level. The study consisted of predominantly female participants, with almost three-quarters (70.9%). The age distribution showed that just over half (58.4%) fell within the 40-59 years range, with a mean age (SD) of 48.3 (12.7) years. Regarding marital status, four out of ten participants (40.7%) reported being married or cohabiting. Educational level revealed that just over two-thirds (68.1%) had informal or primary education. Additionally, nearly a third (29.6%) of the participants were unemployed, participants who had a family history of mental illness were about eight in a hundred participants (7.86%), while a similar proportion (8.4%) reported having diabetes mellitus. Pre-diabetes was observed in about one-fifth of the participants (19.7%), and approximately one-third (34.4%) had a history of alcohol use. Furthermore, just above three-quarters of participants reported experiencing challenges in social support (78.43%) and perceived HIV stigma (77.1%). Just above half of the participants (53.5%) exhibited low adaptive coping mechanisms, while more than three-quarters (87.3%) displayed low maladaptive coping mechanisms, as shown in Table1

Table 1: Description of Socio-demographic and Clinical Characteristics of the Study Participants among PLWH in Moshi Municipal. N (598)

Characteristics	Frequency, n(%)
Site (Health Facility)	
Primary	77 (12.9)
Secondary	335 (56.0)
Tertiary	186 (31.1)
Sex	
Female	424 (70.9)
Male	174 (29.1)
Age group, years: Mean (SD) = 48.3 (12.7)	
18–39	137 (22.9)
40–59	349 (58.4)
≥60	91 (18.7)
Marital status	
Single	116 (19.4)
Divorced/Widowhood	239 (39.9)
Married/Cohabiting	243 (40.7)
Education level	
Informal/primary	407 (68.1)
Secondary	145 (24.2)
College/Higher	46 (7.7)
Employment status	
Unemployed	177 (29.6)
Employed	421 (70.4)
Family history MI	
No	551 (92.1)
Yes	47 (7.86)
Alcohol use	
No	390 (65.6)
Yes	205 (34.4)
Diabetes by HbAlc	
Normal	430 (71.9)
Prediabetes	118 (19.7)
Diabetes	50 (8.4)
Social support	
Poor	340 (56.86)
Average	207 (34.62)
Good	51 (8.53)
Perceived HIV stigma	
Low	461 (77.1)
High	137 (22.9)
Adaptive coping mechanism	
Low	320 (53.5)
High	278 (46.5)
Maladaptive coping mechanism	
Low	522 (87.3)
High	76 (12.7)

KEY: SD= standard deviation

4.2 Prevalence of Depressive Symptoms among PLWH in Moshi Municipal

Fourteen in a hundred participants,14% (n=86) reported depressive symptoms, within this group, 5% reported moderately depressive symptoms, 4% reported moderate-severe depressive and 1% reported severe depressive symptoms, as illustrated in Figure 2

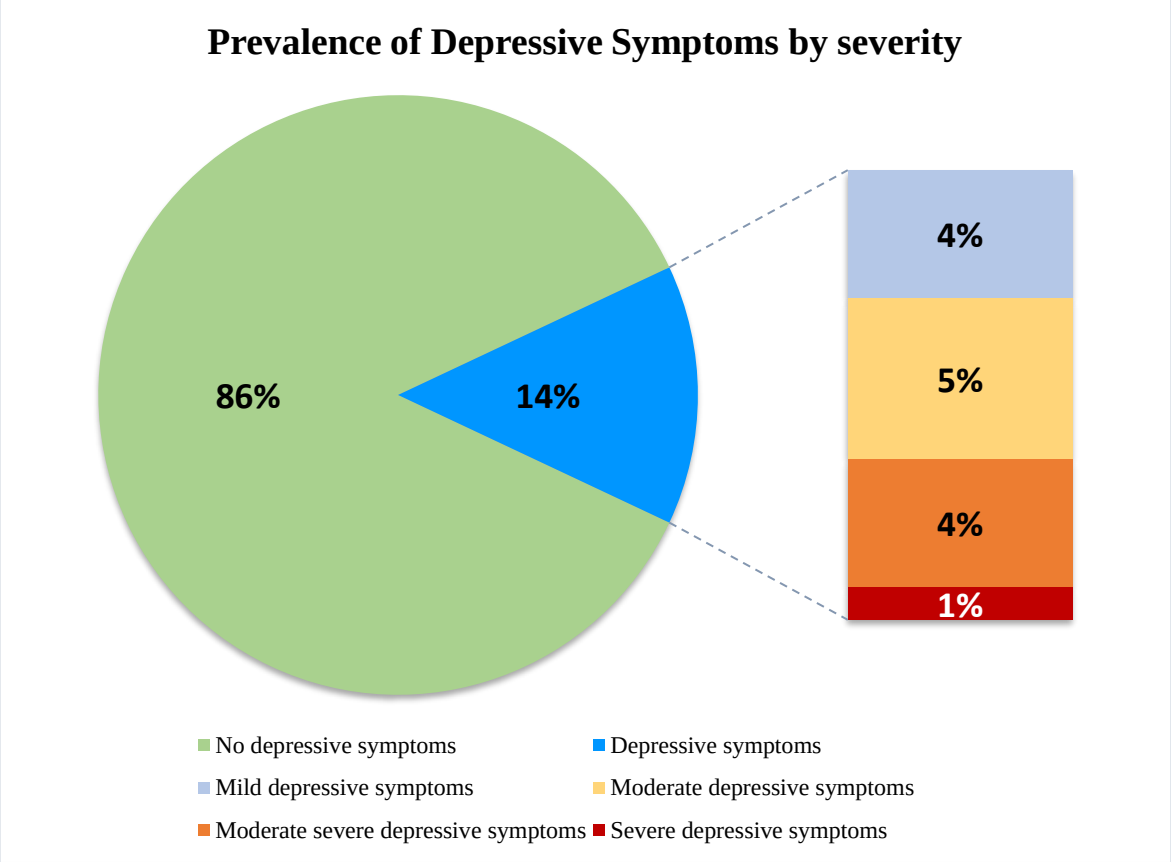


Figure 2: Prevalence of Depressive Symptoms among PLWH in Moshi Municipal

4.3 Biological and Psychosocial Factors Associated with Depressive Symptoms among PLWH in Moshi Municipal

4.3.1. Bivariate analysis

The results of the bivariate analysis of this study are summarized in Table 2 below. Factors such as sites, age, employment status, family history of mental illness, diabetes mellitus, social support, perceived HIV stigma, and coping mechanisms were statistically significantly associated with depressive symptoms p-value less or equal to 0.05. However, factors such as sex, marital status, level of education, and alcohol use were not statistically significantly associated ($p>0.05$) with depressive symptoms.

Specifically, participants at the secondary and tertiary levels exhibited increased odds ratios (OR) for depressive symptoms (OR 1.09, 95% CI: 0.58-1.20; $p = 0.001$) and (OR 1.14, 95% CI: 0.09-1.24; $p = 0.001$), respectively. Those in the age group 40-59 demonstrated significant association with depressive symptoms compared to other age groups (OR 1.62, 95% CI: 1.16-2.24; $p = 0.003$). Unemployment status was also associated with higher odds of depressive symptoms (OR 1.22, 95% CI: 1.04-1.43; $p = 0.014$). Furthermore, participants with a family history of mental illness exhibited significantly higher odds of depressive symptoms compared to those without such a history (OR 3.97, CI: 2.23-7.08; $p = 0.000$). Conversely, participants with diabetes mellitus showed lower odds of depressive symptoms compared to prediabetic individuals or those without diabetes (OR 0.55, CI: 0.33-0.92; $p = 0.023$). Perceived HIV stigma was significantly associated with higher odds of depressive symptoms (OR 1.97, CI: 1.80-2.16; $p = 0.001$), while participants with good social support demonstrated markedly lower odds of depressive symptoms compared to those with poor or average social support (OR 10.12, CI: 2.59-39.60; $p = 0.001$). Additionally, participants exhibiting higher maladaptive coping mechanisms with HIV showed significantly higher odds of depressive symptoms (OR 3.54, CI: 3.49-3.59; $p = 0.001$).

4.3.2. Multivariate analysis

Factors from the bivariate analysis with a p-value of less than 0.25 were entered into a multivariate analysis model; these factors were site, age, sex, marital status, employment status, family history of mental illness, alcohol use, diabetes status, social support, perceived HIV stigma, maladaptive coping mechanism. From these factors, secondary health facilities, family history of mental illness, good and average social support, and maladaptive coping mechanisms were found to be significantly associated with Depressive symptoms among PLWH in Moshi Municipal.

The research findings revealed several significant associations with depressive symptoms. Participants who sought care at a secondary health facility were more likely to have depressive symptoms compared to primary and tertiary levels(AOR 1.28, 95%CI: 1.14-1.76; P 0.000). Those with a family history of mental illness were nearly three times as likely to have depressive symptoms compared to those without (AOR 2.91, 95%CI: 1.58-5.37; P 0.001). Additionally, individuals with average social support were at a fivefold increased risk of experiencing depressive symptoms (AOR 5.44, 95%CI: 1.81-7.38; P 0.003), while those with good social support were eleven times more likely to have depressive symptoms than those with poor social support (AOR 11.11, 95%CI: 2.61-17.1; P 0.001). Participants employing high levels of maladaptive coping mechanisms were almost five times more likely to experience depressive symptoms compared to those using low levels of maladaptive coping (AOR 4.57, 95%CI: 3.32-6.30; P 0.000). Factors such as age, sex, marital status, education level, employment status, diabetes mellitus status, alcohol use, and perceived HIV stigma did not demonstrate statistically significant associations with depressive symptoms, as illustrated in Table 2 below.

Table 2: Bivariate and Multivariate analysis of factors associated with Depressive Symptoms among PLWH in Moshi Municipal

Variable	Total	Reported Depression	COR (95% CI)	P	AOR (95% CI)	Adj.P
Site Level						
Primary	77	10 (13.0)	Ref		Ref	
Secondary	335	47 (14.0)	1.09 (0.58-1.20)	0.001	1.28 (1.14-1.76)	0.000
Tertiary	186	27 (14.5)	1.14 (0.09-1.24)	0.001	1.29 (0.94-1.44)	0.120
Sex						
Female	424	62 (14.6)	1.30 (0.96-1.77)	0.091	1.65 (0.88-3.11)	0.118
Male	174	22 (12.6)	Ref		Ref	
Age group, years						
18–39	137	14 (10.2)	Ref		Ref	
40–59	349	55 (15.8)	1.62(1.16-2.24)	0.003	1.50 (0.93-2.44)	0.098
≥60	112	15 (13.4)	1.27 (0.77-2.09)	0.347	1.34 (0.81-2.20)	0.252
Marital status						
Single	116	17 (14.7)	1.49 (0.80-2.84)	0.228	0.79 (0.40-1.58)	0.511
Divorced/Widowhood	239	36 (15.1)	1.37 (0.93-2.02)	0.106	0.79 (0.58-1.08)	0.139
Married/Cohabiting	243	31 (12.8)	Ref		Ref	
Education level						
Informal/primary	407	57 (14.0)	0.89 (0.59-1.34)	0.569		
Secondary	145	19 (13.1)	0.80 (0.40-1.61)	0.536		
College/Higher	46	8 (17.4)	Ref			
Employment status						
Unemployed	177	28 (15.8)	1.22 (1.04-1.43)	0.014	1.12(0.77-1.29)	0.974
Employed	421	56 (13.3)	Ref		Ref	
Family history MI						
No	551	69 (12.5)	Ref		Ref	
Yes	47	15 (31.9)	3.97 (2.23-7.08)	0.000	2.91 (1.58-5.37)	0.001
Alcohol Use						
No	390	48 (12.3)	Ref		Ref	
Yes	205	36 (17.6)	1.57 (0.94-2.63)	0.084	1.06 (0.71-1.45)	0.932
Diabetes by HbAlc						
Normal	430	64 (14.8)	Ref		Ref	
Prediabetes	118	15 (12.7)	0.89 (0.58-1.38)	0.613	2.15 (0.96-4.80)	0.062
Diabetes	50	5 (10.0)	0.55 (0.33-0.92)	0.023	1.26 (0.44-3.59)	0.665
Social support						
Poor	340	22 (6.47)	Ref		Ref	
Average	207	41 (19.81)	3.57 (0.93-13.70)	0.061	5.44(1.81-7.38)	0.003
Good	51	21 (41.18)	10.12(2.59-39.60)	0.001	11.11(2.61-17.1)	0.001
Perceived HIV stigma						
Low	461	55 (11.9)	Ref		Ref	
High	137	29 (21.2)	1.97 (1.80-2.16)	0.001	1.01 (0.77-1.33)	0.952
Adaptive coping mechanism						
Low	320	35 (10.9)	Ref		Ref	
High	278	49 (17.6)	0.53 (0.27-1.04)	0.065	0.64 (0.34-2.56)	0.201
Maladaptive coping mechanism						
Low	522	60 (11.5)	Ref		Ref	
High	76	24 (31.6)	3.54 (3.49-3.59)	0.001	4.57 (3.32-6.30)	0.000

Key: CI = Confidence Interval, COR = Crude Odds Ratio, AOR = Adjusted Odds Ratio, Adj. P = Adjusted P value

CHAPTER FIVE

5.0 DISCUSSION

The findings of this research are discussed in this chapter. The broad objective of this study was to determine the prevalence and factors associated with depressive symptoms among people living with HIV in Moshi Municipality, Tanzania.

5.1 The prevalence of depressive symptoms among people living with HIV in Moshi Municipality, Tanzania

Depressive symptoms are prevalent among people living with HIV in Moshi Municipal. Fourteen participants in a hundred reported depressive symptoms by using PHQ-9 with a cut-off point of 9 and above; this prevalence is higher than the general population because living with HIV as a chronic condition may lead to stress related to stigma, continuous treatment, and managing potential health complications. The prevalence of depressive symptoms in this study is in keeping with the other studies done in Sub-Saharan Africa, which showed depression among PLWH to range from 9 to 32% (Bernard et al., 2017; Patel et al., 2018) and another systematic review and meta-analysis study in low-middle and high-income countries shows the prevalence of depression to range between 12.8% to 78% (Uthman et al., 2014). Likewise, the study done in Kenya showed the prevalence to be 13.8% (Nyongesa et al., 2019). The similarity may be due to the similarities in study setting and tools used.

The prevalence is somewhat higher than that in the USA (13.74%)(L. M. Adams et al., 2018) and 11.45% in Canada (Aljassem et al., 2016), low prevalence of depressive symptoms in these countries could be attributed to their governmental support for these patients, people's social and cultural awareness, as well as advancements in the health system (Rezaei et al., 2019).

In comparison to other studies, the prevalence of depressive symptoms in this study is notably lower, being only half of the observed in a study involving HIV-positive individuals across three countries (Tanzania, Kenya, and Namibia) where the prevalence was reported as 28% (Seth et al. 2014). The probable reason may be the difference in tools used: the Center for Epidemiologic

Studies-Depression (CES-D) tool versus PHQ9, which was used in this study to assess depressive symptoms.

Likewise, the prevalence of depressive symptoms in this study is almost three times less compared to another study done in Kilimanjaro among newly diagnosed HIV within 12 months, which showed a prevalence of 41% (Madundo et al., 2023). They both use PHQ9 with the same cut-point score, the probable reason for the difference is that this study included those who were on treatment for 6 months and above who might have adapted and accepted the situation of living with HIV compared to the newly diagnosed and hence low prevalence of depressive symptoms.

5.2 Factors associated with Depressive Symptoms among PLWH in Moshi Municipal, Tanzania

People living with HIV attending secondary health facilities were more likely to have depressive symptoms compared to primary and tertiary in this study, the probable reason may be that secondary health facilities received many clients referred from the primary level for further treatment in case of advanced stage or comorbidity with other chronic illness (Zani et al., 2020)while tertiary hospitals offer a more advanced and comprehensive treatment approach for HIV due to their greater resources, including specialized personnel and support systems such as counseling services, which can effectively address depressive symptoms compared to secondary and primary levels.

The presence of a family history of mental illness increases the chance of having depressive symptoms about three times compared to those who do not have, which is similar to other studies in Uganda (Al Balawi et al., 2019; Kinyanda et al., 2011). This could be explained by genetic predisposition that increases the chance of transfer of genes to different generations (Weissman et al., 2016). However, the study done in Ethiopia didn’t show any association between a family history of mental illness and depressive symptoms among PLWH(Abdisa et al., 2021), probably due to the difference in culture that might have led to underreporting or disclosing if they have other family members with mental illness.

Furthermore, good social support has been associated with almost eleven times increased odds of having depressive symptoms, and those with average social support were five times more likely to have depressive symptoms compared with poor social support. The probable reason may be that experiencing depressive symptoms might prompt individuals to seek various forms of support from their family or friends, such as emotional support (Cederbaum et al., 2017; Seffren et al., 2018)or that some respondents may have considered the support given as indifferent or unsupportive that predisposing them to depressive symptoms (Nakasujja et al., 2010).This is different from many studies that showed good social support decreases the likelihood of depressive symptoms among people living with HIV (Amare et al., 2018; Necho et al., 2021; Zewudie et al., 2021). The variation may be explained by different tools used to assess social support, in this study, the Duke-UNC Functional Social Support Questionnaire (FSSQ) was used, while other studies used the OSLO Social Support Scale. This finding is also contrary to the study done in Kilimanjaro for newly diagnosed HIV by using FSSQ that showed no association (Madundo et al., 2023) the probable reason is the difference in the category of levels of social support was done, Madundo had categorized them in quartile while this study did categorize the level of social support into tertiles.

PLWH uses different coping mechanisms to cope with the stresses of having HIV. Having a high maladaptive copying mechanism increases five times likelihood of having depressive symptoms. The possible reasons may be that maladaptive coping provides short relief of the distress but also exacerbates more depressive symptoms(Rzeszutek, 2018). This finding is similar to the study done in India(Kaneez, 2016) and Cameroon (Parcesepe et al., 2023), unlike the study done in Nigeria, PLWH reported using more problem-focused coping instead of maladaptive coping. (Obadiah Dyages et al., 2019).This variation may be due to differences in study setting and cultural differences between Tanzania and Nigeria that may affect how people cope in different situations.

However other factors reported in different studies in Africa showed age(Ayano et al., 2018; Nyongesa et al., 2019), sex (Nyongesa et al., 2019; Oko et al., 2019; Seth et al., 2014) marital status (Oko et al., 2019; Zewudie et al., 2021), employment status (Bhatia & Munjal, 2014b; Oko et al., 2019) level of education (Kitshoff et al., 2012), diabetes (Nyongesa et al., 2019)alcohol use (Basha et al., 2019b) and perceived stigma (Endeshaw et al., 2014; Mwangala et al., 2022) to be associated with depressive symptoms. However, they did not show a significant association in this study, with the possible reason being different settings and tools used.

CHAPTER SIX

6.0 LIMITATIONS OF THE STUDY, STRENGTH OF THE STUDY CONCLUSION AND RECOMMENDATIONS

6.1 Limitations of the Study

1. Information bias and social desirability may have limited the participants' intentions of sharing information on the presence of depressive symptoms, which may have led to overreporting or underreporting of the responses questionnaire. The research team mitigated this by explaining the purpose and benefit of the study.
2. A brief cope scale and Duke Functional of social support tools have not been validated in Tanzania, so this may lead to misinformed responses, which may not give the real result in our context. Therefore, this was mitigated by doing face and content validity of the tool.

6.2 Strength of the Study

1. The study met the minimum estimated sample size by enrolling 598 participants.
2. There was a high response rate from the study participants.
3. Adjustment of factors to control for confounding variables was done.
4. A systematic random sampling strategy was used to enroll participants on each study day hence, this reduced participant selection bias.

6.3 Conclusion

In this study, the prevalence of depressive symptoms among people living with HIV is more common, as one in seven people reported depressive symptoms. Attending a secondary health facility, the presence of a history of mental illness in the family, good and average social support, and using a lot of maladaptive coping mechanisms were associated with depressive symptoms among People Living with HIV.

6.4 Recommendations

The Ministry of Health should allocate more resources, including increasing funding and mental health professionals, to secondary health facilities to enhance comprehensive mental health services that will improve the outcomes for patients and reduce the need for referrals to tertiary health services.

Interventions at CTCs should focus on strengthening social support for people living with HIV, as this can provide crucial moral support and help them manage the challenges of living with HIV. Additionally, service providers should inquire about a family history of mental illness and assess the level of social support when screening clients for mental health depressive symptoms.

Moreover, service providers should address maladaptive coping mechanisms, which are often associated with depressive symptoms, by equipping clients with adaptive coping strategies.

Researchers to conduct further longitudinal research and qualitative research to look for explanations behind these factors and how they associate with depressive symptoms

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APPENDICES

Appendix I: Informed Consent Form – English

MUHIMBILI UNIVERSITY HEALTH AND ALLIED SCIENCES

CONCERT FORM TO PARTICIPATE IN RESEARCH ABOUT THE PREVALENCE OF DEPRESSIVE SYMPTOMS AND ITS ASSOCIATION WITH DIABETES AMONG PEOPLE LIVING WITH HIV IN MOSHI MUNICIPALITY, TANZANIA

To be read with questions answered in a language in which the study subject is conversant (English or Kiswahili).

My name is Neema Allen Ng'unda, I am pursuing a master's Degree in Psychiatry and Mental Health at the Muhimbili University of Health and Allied Sciences doing a study on the prevalence of depressive symptoms and its association with diabetes among people living with HIV in Moshi Municipality, Tanzania, as part of my degree award fulfillment. Being one of the clients at CTC in Moshi Municipal, I would like you to participate in this study. First, I am glad to explain to you about the study and I will be ready to answer any questions concerning my study.

This study aims to determine the prevalence of depressive symptoms and their association with diabetes among people living with HIV in Moshi Municipality, Tanzania.

The study will be done by me under my supervisors. This is academic research and you are required to understand the following which applies to all in the research.

Your participation is voluntary whereby you may withdraw consent at any time in the course of the interview.

Refusal to participate won't affect your treatment in any way.

After reading the explanation, don't hesitate to ask any questions in case a need arises.

I will assess using an instrument that will take about 30 to 45 minutes.

Am asking for permission to draw a sample of your blood that will be used to determine the level of glycemic control and the result will be given back to you and doctors for more treatment.

Information obtained from this study will remain confidential. Code numbers or registration numbers instead of your name will be used in this study for identification.

Risks and benefits: The study will pay for the investigation, the study will not have risks to the participants.

There will be direct benefits to you by knowing your diabetic status and depression which may require referral for further treatment. The net study will be of benefit by providing information on the prevalence of depressive symptoms and its association with diabetes among people living with HIV in Moshi.

For questions or health concerns related to this study, you can call me on my mobile number 0766423903 or my supervisor Dr. Ester Steven 0788202020 at the Department of Psychiatry and Mental Health, Muhimbili University Health and Allied Sciences or you can also contact the chairperson of the Research Senate and Publication committee, Dr. Nahya Salim Masoud-0713250074**.** P.O. Box 65001 Dar es Salaam.

I the undersigned do hereby volunteer to participate in this study. Nature and purpose have been fully explained to me.

I understand that all the information obtained will be used for this study only.

Signed---------- Date ----------

Witnessed---------- Signature---------- Date…….

Appendix 2: Questionnaire English Version

Please cycle or fill in the correct answer.

GENERAL INFORMATION

Date of interview: {...../...../2023) Questionnaire serial No: .....

Name of interviewer: ..... Name of CTC …….

CTC ID number…….

I. SOCIODEMOGRAPHIC CHARACTERISTICS OF STUDY PARTICIPANTS

1. How old are you (age in years)? ……

2. Sex
   1. Male.
   2. Female.

3. What is your marital status?
   1. Single.
   2. Cohabiting
   3. Married.
   4. Divorced/Separated
   5. Widowed/widower

4. What is your highest level of education?
   1. None or Informal education
   2. Primary education
   3. Secondary education
   4. Higher (diploma/ university and above) education

5. What is your current occupation

1. Unemployed
2. Employed
3. Self employed
4. Retired

11. Do you have a blood-related family member has/had mental illness?

0) No

1) Yes

12. Did you use alcohol for the past 12 months?

0) No

1) Yes

II. DUKE-UNC FUNCTION SOCIAL SUPPORT QUESTIONNAIRE (FSSQ)

Here is a list of some things that other people do for us or give us that may be helpful or supportive. Indicate the response that is closest to your situation

		5	4	3	2	1
		As much as I would like	Almost as much as I would like	Some, but I would like more	Less than I would like	Much less than I would like
1. I get visits from friends and family						
2. I get help around the house						
3. I get help with money in an emergency						
4. I get praise for a good job						

5. I have people who care what happens to me						
6. I feel love and affection						
7. I get telephone calls from people I know						
8. I get chances to talk to someone about problems at work or with my housework						
9. I get chances to talk to someone I trust about my personal and family problems						
10. I get chances to talk about money matters						
11. I get invitations to go out and do things with other people						
12. I get useful advice about important things in life						
13. I get help when I need transportation						
14. I get help when I am sick in bed						

III. Depression assessment (PHQ-9)

Now I am going to ask you about symptoms that you may have had in the past two weeks. For each symptom, I will also ask if you currently have the symptom for at least two weeks or if you had the symptom in the period after you delivered until your child was one-year-old.

No		0 Not at all	1 Several days	2 More than half the days	3 Nearly every day
1.	Feeling down, depressed, irritable, or hopeless?				
2.	Little interest or pleasure in doing things?				
3.	Trouble falling asleep, staying asleep, or sleeping too much?				
4.	Poor appetite, weight loss, or overeating?				
5.	Feeling tired, or having little energy?				
6.	Feeling bad about yourself – or feeling that you are a failure, or that you have let yourself or your family down?				
7.	Trouble concentrating on things like school work, reading, or watching TV?				
8.	Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you were moving around a lot more than usual?				
9.	Thoughts that you would be better off dead, or of hurting yourself in some way?				
	TOTAL				
10	If you are experiencing any of the problems on this form, how **difficult** have these problems made it for you to do your work, take care of things at home or get along with other people? 0=Not difficult at all 1=Somewhat difficult 2=Very difficult 3=Extremely difficult				

RESPONSE CODES:

Not at all=0 several days =1 more than half the days= 2 nearly every day= 3

IV: HIV Related Stigma

For each item, give your answer: Strongly disagree (SD), Disagree (D), Agree (A), or Strongly agree (SA)

Dimensions	No		(1) Strongly disagree (SD)	(2) Disagree (D)	(3) Agree (A)	(4) Strongly agree (SA)
Personalized stigma	1a	Some people avoid touching me if they know I have HIV				
	2a	People I care about stopped calling after learning I have HIV				
	3a	I have lost friends by telling them I have HIV				
Disclosure Concerns	1b	Telling someone I have HIV is risky				
	2b	Most people believe a person who has HIV is dirty				
	3b	I am very careful who I tell that I have HIV				
Concerns with Public Attitudes	1c	People with HIV are treated like outcasts				
	2c	Most people believe a person who has HIV is dirty				
	3c	Most people are uncomfortable around someone with HIV				
Negative Self-Image	1d	I feel guilty because I have HIV				
	2d	I feel like I am a bad person because of HIV				
	3d	I feel I'm not as good a person as others because I have HIV				

V:HBa1C Measurements……..

VI: BRIEF COPE SCALE

These items deal with ways you've been coping with the stress in your life since you found out you were HIV positive. There are many ways to try to deal with problems. These items ask what you've been doing to cope with this one. Different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. How much or how frequently. Use these response choices

1 = I usually don't do this at all

2 = I usually do this a little bit

3 = I usually do this a medium amount

4 = I usually do this a lot

1	I've been turning to work or other activities to take my mind off things.	1	2	3	4
2	I've been concentrating my efforts on doing something about the situation I'm in.				
3	I've been saying to myself "this isn't real."				
4	I've been using alcohol or other drugs to make myself feel better.				
5	I've been getting emotional support from others.				
6	I've been giving up trying to deal with it.				
7	I've been taking action to try to make the situation better.				
8	I've been refusing to believe that it has happened.				
9	I've been saying things to let my unpleasant feelings escape.				
10	I've been getting help and advice from other people.				
11	I've been using alcohol or other drugs to help me get through it.				
12	I've been trying to see it in a different light, to make it seem more positive.				
13	I've been criticizing myself.				
14	I've been trying to come up with a strategy about what to do.				

15	I’ve been getting comfort and understanding from someone.				
16	I’ve been giving up the attempt to cope.				
17	I’ve been looking for something good in what is happening.				
18	I’ve been making jokes about it.				
19	I’ve been doing something to think about it less, such as going to movies, watching TV,reading, daydreaming, sleeping, or shopping.				
20	I’ve been accepting the reality of the fact that it has happened.				
21	I’ve been expressing my negative feelings.				
22	I’ve been trying to find comfort in my religion or spiritual beliefs.				
23	I’ve been trying to get advice or help from other people about what to do.				
24	I’ve been learning to live with it.				
25	I’ve been thinking hard about what steps to take.				
26	I’ve been blaming myself for things that happened.				
27	I’ve been praying or meditating.				
28	I’ve been making fun of the situation.				

Appendix 3: Fomu Ya Ridhaa

CHUO KIKUU CHA AFYA NA SAYANSI SHIRIKISHI MUHIMBILI

FOMU YA RIDHAA KUSHIRIKI KWENYE UTAFITI KUHUSU KIWANGO CHA DALILI ZA SONONA NA SABABU ZINAZOHUSANISHA NA KISUKARI MIONGONI MWA WATU WANAOISHI NA VIRUSI VYA UKIMWI KATIKA MANISPAA YA MOSHI, TANZANIA.

Jina langu ni Neema A.Ng'unda. Ninasomea shahada ya uzamiri ya Afya na Magonjwa ya Akili katika chuo kikuu cha Afya na Sayansi Shirikishi Muhimbili, ninafanya utafiti kuhusu kiwango cha dalili za Sonona na sababu zinazohusanisha na Kisukari miongoni mwa watu wanaoishi na virusi vya Ukimwi katika Manispaa ya Moshi, Tanzania. Ikiwa huu ni utafiti wa sayansi ya tiba unapaswa ufahamu yafuatayo kabla ya kushiriki.

Dhumuni la Utafiti huu: Kama nilivyo sema hapo awali Dhumuni ni kufanya utafiti kuhusu kiwango cha Sonona na sababu zinazohusanisha na Kisukari miongoni mwa watu wanaoishi na virusi vya Ukimwi katika Manispaa ya Moshi, Tanzania.

Namna ya kushiriki : Kushiriki kwako kwenye utafiti huu ni wa hiyari kabisa na unaweza kukataa kushiriki au kusitisha mahojiano wakati wowote. Kukataa kushiriki hakutaingilia matibabu yako.

Usisite kuuliza swali lolote pale unapoona kuna sababu. Kama ukikubali kushiriki mahojiano yataendeshwa kwa kutumia dodoso maalum.

Madhara: Ikiwa wakati unajieleza ukipata kikwazo na kuona unahitaji mshauri nasaha au mtoa huduma wa afya ya akili kwa mazungumzo zaidi tutakuwa tayari kusaidia. Pia damu kidogo itatolewa kwa ajili ya kupima kiwango cha sukari mwilini mwako.

Usiri: Taarifa zako utakazozitoa hazitawekwa hadharani kwa namna yeyote ile kwa hiyo ushiriki wako hautafahamika. Jina lako au taarifa zozote zinazokutambulisha hazitaambatanishwa na taarifa zako utakazozitoa.

Mwisho wa ufafiti taarifa hizi zitafungiwa na baadaye kuharibiwa baada ya kuwekwa na kutunzwa kwenye mfumo wa elektroniki.

Kumbuka: Utafiti utalipia gharama za vipimo, kutakuwa na faida ya moja kwa moja kwako kutokana na utafiti huu kufahamu hali ya uthibiti wa sukari yako mwilini na sonona ambapo inaweza hitajika rufaa kwa matibabu zaidi. Kwa Ujumla matokeo ya utafiti yatasaidia kuonesha kiwango cha sonona na sababu zinazohusiana na kisukari miongoni mwa watu wanaoishi na virusi vya Ukimwi.katika Manispaa ya Moshi.

Nani wa kumuuliza: Kama una maswali zaidi ambayo ungependa kuuliza kuhusiana na utafiti huu, tafadhali wasiliana na Mtafiti Mkuu Neema A Ng’unda (0766423903) au Msimamizi wangu, Daktari Ester Steven (0788202020) Idara ya magonjwa ya akili, Chuo Kikuu cha afya Muhimbili au Mwenyekiti wa kamati ya utafiti na machapisho ya chuo Daktari Nahya Salim Masound (0713250074)

S.L.P. 65001 Dar -es -salaam, Tanzania
Sahihi…….
Unakubali Kushiriki?.....
Mshiriki amekubali…….
Nimesoma au nimeambiwa kuhusu yaliyomo humu ndani. Maswali yangu yamejibiwa.
Nakubali kushiriki katika utafiti huu.

Appendix 4: Dodoso

Tafadhari jaza/weka vyema au zungushia jibu ambalo unaona ni sahihi kwako katika sehemu husika

MAELEZO YA UJUMLA

Tarehe ya Mahojiano (……/……/2023) Namba ya Dodoso……...

Jina la Msaili……Jina la CTC ……..

Namba ya kadi ya CTC

I. MAELEZO YA KIJAMII YA MSHIRIKI

1.Umri wako ni miaka mingapi ……

2.Jinsia yako

a) wakiume
b) Wakike

3.Hali yako ya ndoa

a) Sijaoa/sijaolewa
b) Ninaishi na mpenzi ambaye sijamuoa/hajanioa
c) Nimeoa/Nimeolewa
d) Tumetengana/kuachana
e) Mgane/Mjane

4. Kiwango gani cha juu cha elimu umefikia?

a) Sijawahi kwenda shule
b) Elimu ya msingi
c) Elimu ya sekondari
d) Elimu ya juu(chou)

5. Shughuli gani kuu inayokupatia kipato?

a) Sina ajira
b) Nimeajiriwa
c) Nimejiajiri
d) Nimestaafu

11. Je, una ndugu kutoka kwenye familia aliyegundulika kuwa na Ugonjwa wa akili?

0)hapana

1)Ndio

12. Je, unatumia pombe kwa miezi 12 iliyopita?

0)hapana

1)Ndio

II. MAMBO TUYAPATAYO KIJAMII KAMA MSAADA

Hivi ni vitu ambavyo watu wanatufanyia au kutupa ambavyo vinaweza kutusaidia au kuwa na msaada kwetu. Tafadhali onyesha jibu linaloshabihiana kwa ukaribu na hali yako

Jibu kwa kila kipengele iwapo kinakaribiana na hali yako kwa kiasi kikubwa, kidogo au kidogo Zaidi unachopenda au haijawahi kutokea”

	5	4	3	2	1
	Nime-ridhika kabisa	Nime-ridhika kiasi	Kiasi, lakini ninge-penda zaidi	Sija-ridhika kiasi	Sija-ridhika kabisa
Natembelewa na ndugu, jamaa na marafiki					
Napata msaada katika shughuli za nyumbani					
Napata msaada wa kifedha nikiwa na dharura					
Napongezwa kwa jitihada zangu					
Nina watu wanaojali kinachonitokea					

Nahisi upendo kutoka kwa watu wangu wa karibu					
Napigiwa simu na watu ninaowafahamu					
Napata nafasi ya kuongea na mtu kuhusu shida ninazopitia kazini au nyumbani					
Napata nafasi ya kuongea na mtu ninayemuamini kuhusu matatizo yangu na ya familia					
Napata nafasi kuongelea matatizo ya kifedha					
Napata mialiko kutoka kwa ndugu, jamaa na marafiki					
Napata ushauri mzuri kuhusu mambo muhimu katika maisha					
Napata msaada ninapohitaji usafiri					
Napata msaada ninapokuwa nauguliwa au nimelazwa					

II. Udadisi kuhusu dalili za sonona (PHQ-9)

Sasa nitakuuliza kuhusu dalili ambazo umekuwa nazo wiki mbili zilizopita, kwa kila dalili uliyoipata weka vema jibu ambalo lipo karibu na hali yako halisi

MACHAGUO:Hakuna kabisa=0 Siku kadhaa=1 Zaidi ya nusu ya siku zote=2 Karibu kila siku=3

Katika wiki mbili zilizopita, ni mara ngapi umesumbuliwa na matatizo tajwa yafuatayo (weka vema kuonyesha jibu sahihi)	Hakuna kabisa=0	Siku kadhaa=1	Zaidi ya nusu ya siku zote=2	Karibu kila siku=3
1. Kuwa na mwelekeo mdogo na kukosa raha ya kufanya vitu				
2.Kujisikia huwezi kuchangamka, kuwa na huzuni au kukosa tumaini				
3.Tatizo la kupata usingizi, au kuendelea kulala baada ya kuupata au kulala kupita kiasi				
4.Kujisikia kuchoka na kuwa na nguvu kidogo				
5.Kupungua hamu ya kula chakula au kula kupita kiasi				
6.Kujisikia vibaya au kujisikia kama umeshindwa au umejishusha au kuishushia[thamani] familia yako				
7.Tatizo la kutuliza akili kwenye vitu kama kusoma magazeti au kuangalia luninga (TV)				
8.Kusogea au kuzungumza polepole sana hata ingeweza kuonekana kwa watu wengine ama kuwa na mashaka/wasiwasi				

au kufadhaika kiasi hata ukitembea, unatembea kuliko kawaida				
9.Fikira kwamba ni heri kufa au kuwaza kujiumiza				
10.Kama kumekuwa na tatizo lolote hapo juu, je ni kwa kiasi gani hili tatizo limeacha usiweze kufanya kazi, kushughulikia maswala ya nyumbani au katika mahusiano yako nawatu wengine? 0 = Sio vigumu hata kidogo; 1 = Vigumu kidogo; 2 = Vigumu sana 3 = Vigumu kupita kiasi				

IV: UNYANYAPAA UTOKANAO NA VVU

			(0) Sikubaliani sana (SS)	**(1)** Sikubaliani (S)	**(2)** Nakubali (N),	**(3)** nakubali kabisa (NK)
Unyanyapaa wa kibinafsi	1a	Watu wengine huepuka kunigusa ikiwa wanajua nina VVU				
	2a	Watu ninao wajali waliacha kupiga simu baada ya kujifunza kuwa nina VVU				
	3a	Nimepoteza marafiki kwa kuwaambia kuwa nina VVU				
Hofu za kufichua	1b	Kumwambia mtu kuwa na VVU nihatari				

	hali ya kiafya	2b	Ninajitahidi kuweka hali yangu ya VVU kwa siri					
		3b	Niko mwangalifu sana kwa ambaye ninamwambia nina VVU					
	Hofu na Mtazamo kutoka kwa Umma	1c	Watu waliona VVU huchukuliwa kama wafukuzwaji					
		2c	Watu wengi wanaamini mtu ambaye ana VVU nimchafu					
		3c	Watu wengi hawana raha kuwa karibu na mtu aliye na VVU					
	Picha hasi ya ubinafsi	1d	Ninajiona nahatia kwa sababuni na VVU					
		2d	Ninahisi kama mimi ni mtu mbaya kwa sababu ya VVU					
		3d	Ninahisi sio mtu mzuri kama wengine kwa sababu nina VVU					

V: JINSI YA KUKABILIANA NA HALI YA VVU

Vipengele hivi vinahusika na njia ambazo umekuwa ukikabiliana na mfadhaiko katika maisha yako tangu ulipogundulika kuwa umeathirika na VVU. Kuna njia nyingi za kujaribu kukabiliana na matatizo. Vipengele hivi vinauliza umekuwa ukifanya nini ili kukabiliana na hili tatizo. Watu tofauti hushughulikia mambo kwa njia tofauti, lakini nina haja ya kujua ni kwa jinsi gani umejaribu kukabiliana na hali hii. Kila kipengele kinasema jambo fulani kuhusu njia fulani ya kukabiliana nayo. Nataka kujua ni kwa kiwango gani umekuwa ukifanya kile kitu kila kipengele kinasema. Kiasi gani au mara ngapi.

1 = huwa sifanyi hivi hata kidogo

2 = huwa nafanya hivi kidogo

3 = huwa nikifanya hivi kwa wastani

4 = huwa nikifanya hivi mara nyingi

1	Nimekuwa nikigeukia kazi au shughuli zingine ili kuondoa mawazo yangu	1	2	3	4
2	Nimekuwa nikielekeza juhudi zangu katika kufanya kitu kuhusu hali niliyo nay				
3	Nimekuwa nikijiambia "hii sio kweli."				
4	Kunywa pombe au kutumia madawa ya kulevya ili uondoe mfadhaiko				
5	Unatafuta faraja kutoka kwa marafiki, mwenza wako, ndugu, watoa huduma wa afya, na wengineo.				
6	Nimekuwa nikikata tamaa kujaribu kukabiliana na hali.				
7	Nimekuwa nikichukua hatua mbalimbali kujaribu kufanya hali kuwa bora				
8	Nimekuwa nikikataa kuamini kuwa imeshatokea				
9	Nimekuwa nikisema mambo ili kuruhusu hisia zangu mbaya zitoke				
10	Nimekuwa nikipata msaada na ushauri kutoka kwa watu wengine				
11	Nimekuwa nikitumia pombe au dawa nyinginezo ili kunisaidia kukabiliana na hali				
12	Nimekuwa nikijaribu kuiona kwa mtazamo tofauti, ili kuifanya ionekane chanya zaidi.				

13	Nimekuwa nikijilaumu mwenyewe				
14	Nimekuwa nikijaribu kuja na mbinu ya namna gani ya kufanya				
15	Nimekuwa nikipata faraja na uelewa kutoka kwa mtu				
16	Nimekuwa nikiacha kujaribu kustahimili				
17	Nimekuwa nikitafuta kitu kizuri katika kile kinachotokea				
18	Nimekuwa nikifanya utani juu ya hali yangu ya maambukizi				
19	Nimekuwa nikifanya mambo, kama vile kwenda kwenye sinema, kutazama televisheni, kusoma, kulala, au kufanya manunuzi ili nisifikirie				
20	Nimekuwa nikikubali ukweli kwamba imetokea				
21	Nimekuwa nikionyesha hisia zangu hasi				
22	Nimekuwa nikijaribu kupata faraja katika dini yangu au imani yangu ya kiroho				
23	Nimekuwa nikijaribu kupata ushauri au usaidizi kutoka kwa watu wengine kuhusu nini cha kufanya kuhusu afya yangu				
24	Nimekuwa nikijifunza kuishi nayo				
25	Nimekuwa nikifikiria sana ni hatua gani za kuchukua				
26	Nimekuwa nikijalaum kwa vitu vilivyotokea				
27	nimekuwa nasali au kutafakari				
28	Nimekuwa nikifanya utani kuhusu hii hali				

VI: Majibu ya kipimo cha HBA1C…….

Appendix 5: Ethical Clearance Form

UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR – RESEARCH, PUBLICATIONS AND INNOVATION

Ref. No DA 282/298/01.C/1819 Date: 24/07/2023

MUHAS-REC-07-2023-1819
NEEMA ALLEN NG'UNDA
SCHOOL OF MEDICINE
MUHAS

RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED: PREVALENCE AND FACTORS ASSOCIATED WITH DEPRESSIVE SYMPTOMS AMONG PEOPLE LIVING WITH HIV IN MOSHI MUNICIPALITY, TANZANIA.

Reference is made to the above heading,

I am pleased to inform you that the Chairperson has on behalf of the University Senate, approved ethical clearance of the above-mentioned study, on recommendations of the Senate Research and Publications Committee meeting accordance with MUHAS research policy and Tanzania regulations governing human and animal subjects research.

APPROVAL DATE 24/07/2023
EXPIRATION DATE OF APPROVAL: 24/07/2024

STUDY DESCRIPTION:
Purpose:

The purpose of this observational cross-sectional study is to determine the prevalence and factors associated with depressive symptoms among people living with HIV in Moshi Municipality, Tanzania.

The approved protocol and procedures for this study is attached and stamped with this letter, and can be found in the link provided:

https://irb.muhas.ac.tz/storage/Certificates/Certificate%20-%2014874.pdf and in the MUHAS archives.

The PI is required to:

1. Submit bi-annual progress reports and final report upon completion of the study.
2. Report to the IRB any unanticipated problem involving risks to subjects or others including adverse events where applicable.
3. Apply for renewal of approval of ethical clearance one (1) month prior its expiration if the study is not completed at the end of this ethical approval. You may not continue with any research activity beyond the expiration date without the approval of the IRB. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.
4. Obtain IRB amendment (s) approval for any changes to any aspect of this study before they can be implemented.
5. Data security is ultimately the responsibility of the investigator.
6. Apply for and obtain data transfer agreement (DTA) from NIMR if data will be transferred to a foreign country.
7. Apply for and obtain material transfer agreement (MTA) from NIMR, if research materials (samples) will be shipped to a foreign country.
8. Any researcher, who contravenes or fail to comply with these conditions, shall be guilty of an offence and shall be liable on conviction to a fine as per NIMR Act No 23 of 1979, PART III section 10 (2)
9. The PI is required to ensure that the findings of the study are disseminated to relevant stake holders.
10. PI is required to be versed with necessary laws and regulatory policies that govern research in Tanzania. Some guidance is available on our website https://drp.muhas.ac.tz/.

Dr Nahya Salim Masoud,
Chairperson, MUHAS Research and Ethics Committee

Muhimbili University of Health and Allied Sciences
DIRECTOR
Research, Publications & Innovations
Box 65001

Appendix 6: Ethical Clearance, Introduction Letter

UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR – POSTGRADUATE STUDIES

In reply quote;
Ref. No. HD/MUH/T.224/2021

14th August, 2023

The Regional Administrative Secretary,
P.O. Box 3070,
MOSHI.

Re: INTRODUCTION LETTER

The bearer of this letter is Neema Allen Ng'unda (HD/MUH/T.224/2021), a student at Muhimbili University of Health and Allied Sciences (MUHAS) MMed. Psychiatry.

As part of her studies she intends to do a study titled: **"Prevalence and Factors Associated ith Depressive Symptoms Among People Living with HIV in Moshi Municipaltiy, Tanzania."** The research has been approved by the Chairman of University Senate.

Kindly provide her the necessary assistance to facilitate the conduct of her research.

We thank you for your cooperation.

Mr. Sebe Mohamed
For: DIRECTOR, POSTGRADUATE STUDIES

c.c Neema Allen Ng'unda

9 United Nations Road; Upanga West; P.O. Box 65001, Dar Es Salaam: Tel. G/Line: +255-22-2150302/6; Ext. 1015; Direct Line:+255-22-2151378;Telefax:+255-22-2150465;E-mail:dpgs@muhas.ac.tz;Web:https://www.muhas.ac.tz

Appendix 7: Ethical Clearance, Permission Letter

JAMHURI YA MUUNGANO WA TANZANIA

OFISI YA RAIS TAWALA ZA MIKOA NA SERIKALI ZA MITAA (TAMISEMI)

HALMASHAURI YA MANISPAA YA MOSHI

Unapojibu tafadhali taja:

Kumb. Na. .40/13/1/VOL.33/63 Tarehe: 29/08/2023

Mganga Mfawidhi KCMC, Mawenzi Hospitali
Kituo cha Afya Pasua na Kituo cha Afya Majengo
Halmashauri ya Manispaa
MOSHI.

Yah: UTAMBULISHO WA WANAFUNZI KWA AJILI YA UTAFITI

Tafadhali mada tajwa hapo juu isomwe pamoja na barua ya Katibu Tawala Mkoa - Kilimanjaro yenye Kumb. Na. DC.109/228/01'H'/104 ya tarehe 21 Agosti, 2023.

2. Barua hii inamtambulisha kwenu Neema Allen Ngunda,Frank Kiwango na Florian Emanuel wanafunzi kutoka Chuo Kikuu cha MUHAS ambao wamepata kibali cha kufanya utafiti unaotambulika kama **"Utafiti unaotathimini sababu zainazochangia watu wanaoishi na Virusi vya Ukimwi (VVU) Kupata magonjwa ya akili ".** Utafiti huu utafanyika kwa kipindi cha mwaka mmoja katiaka Hospitali ya KCM, Mawnzi Hospitali Kituo cha Afya Pasua na Majaengo.

3. Nawatakia kazi njema.

Justine J.Chami
Kny. MKURUGENZI
Kny.MKURUGENZI WA MANISPAA
MOSHI

Nakala: Katibu Tawala (W) Moshi,
Ofisi ya Mkuu wa Wilaya ya Moshi,
S.L.P 3042,
MOSHI.

: Neema Allen Ngunda,Frank Kiwango na Florian Emanuel
Wanafunzi
MUHAS

Ukumbi wa Manispaa, S.L.P 318, MOSHI, KILIMANJARO. Simu: +255-027-2752344, +255-027-2754371/4, Nukushi: +255-027-2752906, Barua pepe md@moshimc.go.tz, Tovuti: www.moshimc.go.tz