PREVALENCE AND FACTORS ASSOCIATED WITH ANXIETY AMONG PEOPLE LIVING WITH HIV/AIDS IN MOSHI MUNICIPALITY, KILIMANJARO REGION, TANZANIA

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Master of Medicine (Psychiatry) Dissertation

Muhimbili University of Health and Allied Sciences

October, 2024

Muhimbili University of Health and Allied Sciences

School of Clinical Medicine

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By

Frank Kiwango (MD)

A dissertation Submitted in (Partial) Fulfillment of the required for the Degree Award of Master of Medicine (Psychiatry) at

Muhimbili University of Health and Allied Sciences

October, 2024

CERTIFICATION

The undersigned certifies that she/he has read and hereby recommends for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled: “Prevalence and factors associated with anxiety among people living with HIV/AIDS in Moshi municipality, Kilimanjaro region, Tanzania” in (Partial) fulfillment of the requirement for the degree of Master of Medicine (Psychiatry) of the Muhimbili University of Health and Allied Sciences.

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Professor. Sylvia Kaaya

(Supervisor)

Date:……

……

Dr. Iddi Haruna

(Co-supervisor)

Date:……

DECLARATION AND COPYRIGHT

I, Frank Kiwango, declare that this dissertation is my original work and it has not been presented and will not be presented to any University for a similar or any other degree award.

Signatur…….. Date……..

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ACKNOWLEDGMENTS

First and foremost, I want to express my sincere gratitude to the Almighty God for providing me with the health and strength I needed to finish this study. I sincerely appreciate Prof. Sylvia Kaaya, my supervisor, and Dr. Iddi Haruna, my co-supervisor, for their valuable support and guidance during my research work.

I am thankful for my family's moral support, which motivated me as I studied. From the start of the research project until the completion of the final report, the Department of Psychiatry and Mental Health (MUHAS and MNH) members have provided me with steadfast support, for which I am truly grateful. Specifically, I wish to acknowledge all members of the CTC centers in KCMC, Mawenzi Regional Referral Hospital, Pasua, and Majengo Health Centers in Moshi Municipal. I am also very thankful to all my colleagues who have supported me during my studies and time here at MUHAS.

I sincerely appreciate the KCMC-DUKE collaboration, which funded my research under the D43-TW009595 Grant. Lastly, I want to sincerely thank all the clients who so kindly gave their time and patience to participate in this study; without them, the research thesis could not have been finished.

DEDICATION

I dedicate this work to my beloved parents, Mr. Joseph Ngalason Kiwango and Mrs. Euphemia Arcad Mtenga, who have supported me throughout my studies and have been a source of motivation and strength.

ABSTRACT

Human immunodeficiency virus (HIV) is a retroviral infection that weakens the immune system. If left untreated, HIV progresses to the acquired immunodeficiency syndrome (AIDS). In Tanzania, 1.6 million of about 70 million people live with HIV (PLWHA) and are more prone to mental health illnesses such as generalized anxiety disorder that may affect clinical outcomes. While several generalized anxiety risk factors in PLWHA have been identified elsewhere, there is a limited understanding of the prevalence of significant anxiety symptoms and its associated risk factors among adult PLWHA in the Tanzanian context.

Objective: To determine the prevalence of significant anxiety symptoms and associated risk factors among adult PLWHA attending selected HIV clinics (CTC centers) in Moshi Municipality, Kilimanjaro Region

Materials and methods: The study used a hospital-based cross-sectional quantitative analytical design at CTCs in Moshi Municipality, in the Kilimanjaro region. Four out of 19 CTCs were randomly selected using multistage cluster sampling. A systematic random sampling approach enrolled adult PLWHA (18 years and older) participants in the study from September to October 2023. Data was collected using face-to-face interviews by Redcap software version 5.27.2. Significant anxiety symptoms were assessed using a validated Swahili version of a 7-item Generalized Anxiety Disorder Screener. A semi-structured questionnaire captured the social demographic and clinical information characteristics of participants. STATA version 15 was used to enter and analyze data, respectively. The sample's description was summarized using frequency distributions for categorical measures, mean with standard deviations (SD), and medians with interquartile ranges for continuous variables. Bivariate analyses identified risk factors associated with significant anxiety symptoms at p-values ≤ 0.20 for inclusion in logistic regression models to determine independent risk factors at p-values <0.05. The MUHAS Senate Research and Publications Committee provided ethical clearance and permission sought from the respective research CTCs.

Results: A total of 593 PLWHA participated in the study, 429 of whom were female (72.3%). The mean age of participants was 47.5 years (SD=13.2), and 12.5% screened positive for significant anxiety symptoms. Participants treated at the tertiary health facility level compared to the primary showed a seven times higher likelihood of significant anxiety symptoms (AOR=7.4, 95% CI: 6.14-9.04, P-value=0.00). Significant anxiety symptoms were associated with reported substance use compared to none, increasing the likelihood nearly five-fold (AOR= 4.69, 95% CI: 1.12-19.53, P-value = 0.03). Screening positive for probable depression versus not increased by five times the likelihood of significant anxiety symptoms (AOR= 5.02, 95% CI: 2.34-11.06, P-value = 0.00). Similarly, participants with high compared to those with low anxiety sensitivity were 15 times more likely to have significant anxiety symptoms (AOR= 15.39, 95% CI: 3.88-61.14, P-value = 0.00). PLWHA reporting low, compared to those reporting higher adaptive coping mechanisms, were three times more likely to have significant anxiety symptoms (AOR= 3.48, 95% CI: 1.43-8.46, P-value = 0.01). Reporting higher compared to low levels of perceived social support increased three times the likelihood of developing significant anxiety symptoms (AOR=3.35; 95% CI: 1.61-6.96, P-value = 0.00).

Conclusions: Significant anxiety symptoms were common, affecting one in eight adult PLWHA in this study. Receiving care at CTCs located in higher health facility levels, using substances of abuse, screening positive for probable depression, high anxiety sensitivity, higher social support, or low use of adaptive coping mechanisms were associated with significant anxiety symptoms.

Recommendation: Integrating routine anxiety screening in PLWHA and raising awareness among patients and their primary caregivers is recommended.

Keywords: Anxiety prevalence, PLWHA, and GAD

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LIST OF ABBREVIATIONS

AIDS	-	Acquired Immune-deficiency Syndrome
ART	-	Antiretroviral Therapy
BSI	-	Brief Symptom Inventory Instrument
CISR	-	Clinical Interview Schedule-Revised
CTC	-	Care and Treatment Centers
GAD-7	-	Generalized Anxiety Disorder 7
HADS	-	Hospital Anxiety and Depression Scale
HASI	-	HIV/AIDS Stigma Instrument
HIV	-	Human Immune Deficiency Virus
MUHAS	-	Muhimbili University of Heath and Allied Sciences
PLWHA	-	People living with HIV/AIDS
PSS	-	Perceived Social Support Scale
RA	-	Research Assistant
SPSS	-	Statistical Package for Social Sciences
SSA	-	Sub-Saharan Africa
SSASI	-	Short Scale Anxiety Sensitivity Index
WHO	-	World Health Organization

OPERATIONAL DEFINITIONS

Significant anxiety symptoms refer to the presence of intense, persistent feelings of worry and anxiety about several events that interfere significantly with daily functioning; they are screened and quantified using the 7-item Generalized Anxiety Disorder (GAD-7) screener with a cutoff point of 10 or higher, identifying significant anxiety symptoms.

DEFINITION OF TERMS

Human immunodeficiency virus (HIV) is a retroviral infection that weakens the immune system. When left untreated, it progresses to acquired immunodeficiency syndrome. HIV transmission occurs via the exchange of various body fluids from infected people, such as blood, breast milk, semen, and vaginal secretions. HIV can also be transmitted from a mother to her child during pregnancy and delivery (Rumbwere Dube et al., 2018)

Anxiety risk factors of interest for this study include a combination of biological, psychological, and social factors to be investigated as independent variables, namely social support, HIV/AIDS-associated stigma, significant depressive symptoms, and anxiety sensitivity. (Camara et al., 2019; Olatayo Adeoti et al., 2018; Tesfaw et al., 2016)

People living with HIV/AIDS (PLWHA) refers to individuals who are infected with the human immunodeficiency virus. (TDHS, 2023)

Care and treatment clinics (CTCs) are public health facilities providing services to people living with HIV. The services include 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, 2023)

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Human Immunodeficiency Virus (HIV) targets the immune system and predisposes one to other infections due to impaired immunity and is often fatal when left untreated. (UNAIDS, 2013). World Health Organization 2021 report estimates that 38.4 million people are living with HIV/AIDS (PLWHA) globally, and two-thirds reside in Africa (WHO, 2022). In Tanzania, HIV/AIDS is a severe public health problem, with reports of 1.6 million persons living with HIV and AIDS (PLWHA) (Wang et al., 2022). PLWHA are more prone to common mental disorders, including depression, generalized anxiety, and substance use disorders (Collins et al., 2021). Furthermore, HIV/AIDS and generalized anxiety disorder have a bi-directional association. (Brandt et al., 2017; Collins et al., 2021). The bi-directional association of the two conditions results in the co-occurrence of anxiety and HIV, in which they influence each other in terms of symptoms and severity. (Brandt et al., 2017). Little is known about the rates of generalized anxiety in adult PLWHA in Tanzania.

Reports suggest the prevalence of significant anxiety symptoms in PLWHA in European countries is higher when compared to rates in PLWHA sampled from Asian and African countries. For example, in Italy and England, levels of self-rated and clinician-rated anxiety using the Hospital Anxiety and Depression Scale (HADS) among PLWHA were estimated at 47% (Rahmati et al., 2021) and 34% respectively (Rahmati et al., 2021). In sub-Saharan Africa samples, rates of significant anxiety symptoms are lower among PLWHA. For example, in South Africa, the presence of substantial anxiety symptoms occurs in 9% of PLWHA assessed using the Generalized Anxiety Disorder Scale (GAD-7 items) (Rane et al., 2018), while a study in a provincial town in Eastern Tanzania using the Clinical Interview Schedule-Revised (CISR) (a diagnostic tool), reports rates of 4.5% for anxiety disorders alone, and 15.5% for depression or mixed anxiety and depressive disorder (Marwick and Kaaya, 2010). However, anxiety rates in PLWHA were 37.8% in a Northern Tanzania municipality when measured using the Brief Symptom Inventory (BSI) screening tool (Knettel et al., 2021). Assessment for anxiety using diagnostic tools often

returns lower prevalence rates than when screening tools are used (Chibanda et al., 2016; Saal et al., 2019). Furthermore, in the African context, cultural variations in expressions of anxiety may require tools developed in other cultural contexts to be culturally adapted and validated to provide accurate assessments (Ali et al., 2016; Lewis-Fernández et al., 2010). However, in busy CTCs, a brief screening tool with face validity and a validated cut-off score for significant levels of generalized anxiety severity is beneficial for initial recognition, allowing for, in a positive sub-sample of clients, further diagnostic assessments for clinically significant anxiety. Limited studies have explored the occurrence of generalized anxiety in PLWHA in Tanzania and its potential effects on HIV treatment outcomes.

Studies show various psychosocial risk factors that are associated with significant anxiety symptoms in PLWHA, such as lack of adequate social support in Pakistani and Ethiopian samples (Ahmed et al., 2021; Duko et al., 2019); and HIV-related stigma in Ethiopia (Ahmed et al., 2021; Armoon et al., 2022; Tesfaw et al., 2016). At a more individual level, high levels of anxiety sensitivity are reported in persons with substance use (Brandt et al., 2017; Gonzalez et al., 2010, Ahmed et al., 2021), younger compared to older ages (Ahmed et al., 2021; Camara et al., 2019; Olatayo Adeoti et al., 2018), persons that were unemployed and/or had low levels of education (Campos et al., 2010; Tesfaw et al., 2016), marital status - specifically being single, divorced or widowed (Campos et al., 2010; Tesfaw et al., 2016), being female compared to male (Bedaso et al., 2016; Tesfaw et al., 2016), and the presence of co-morbid depressive disorder in PLWHA were associated with significant levels of anxiety symptoms (Camara et al., 2019; Olatayo Adeoti et al., 2018; Tesfaw et al., 2016). HIV-related stigma, substance use, and perceived poor social support are intervenable anxiety risk factors, and their recognition may better allow for holistic clinical management of both the physical and psychological health of PLWHA.

Furthermore, the dimensional nature of anxiety may also mean persons with below-threshold scores for significant anxiety symptoms may also need help, especially if the symptoms affect HIV treatment outcomes. For example, evidence shows that PLWHA with low CD4 counts and higher viral load (VL) were more likely to have significant generalized anxiety symptoms compared to those with higher CD4 counts and lower viral load (Cohen et al., 2002., Ahmed et al., 2021., Truong et al. 2021). From a systematic

review, significant generalized anxiety symptoms have been associated with declines in ART adherence in samples from Africa and other low and middle-income countries (LMIC) (Parcesepe et al., 2018; Wykowski et al., 2019). This association of significant anxiety with poor ART adherence may be the mechanism underlying evidenced associations between viral load suppression and the presence of significant anxiety symptoms. However, there were few retrievable articles on the prevalence and risk factors for significant symptoms of generalized anxiety disorder among adults living with HIV/AIDS in Tanzania. This study seeks to determine the prevalence of significant generalized anxiety symptoms in PLWHA and its associated factors among adult PLWHA attending CTC centers.

1.2 Statement of Problem

Tanzania is estimated to rank fifth in the incidence of HIV globally (Kharsany & Karim, 2016). Studies show significant anxiety symptoms to be common among PLWHA. They are associated with higher rates of morbidity and mortality, perhaps through delaying seeking of care and physical health effects, hence leading to poor treatment outcomes such as ART non-adherence (Camara et al., 2019; Olatayo Adeoti et al., 2018). In the absence of studies, little is known regarding the associations between high levels of generalized anxiety symptoms and poor HIV treatment outcomes in the Tanzanian context. Most studies exploring the problem of significant anxiety occur in the general population and not in PLWHA. Also, studies reporting anxiety prevalence PLWHA have not described factors associated with significant anxiety symptoms (Marwick & Kaaya, 2010., Knettel et al., 2021). This study generates information on the magnitude and factors associated with significant anxiety symptoms among adult PLWHA in Moshi Municipal.

Study findings may inform clinic-based interventions, such as the need for prevention by early diagnosis and treatment of significant anxiety symptoms among PLWHA, to potentially reverse poor clinical outcomes such as declines in ART adherence.

1.3 Theoretical Framework

In 1977, the biopsychosocial model was introduced by George Engel (Wright et al., 2019). Its focus was to explain different and interacting factors contributing to the development of illness. The model suggests that the occurrence of a condition, in this case, significant anxiety symptoms, may be determined by biological, psychological, and social factors, as revealed by the review of anxiety risk factors in PLWHA in this document. Hence, I will consult the biopsychosocial model (Wright et al., 2019), to determine the occurrence of significant anxiety symptoms among PLWHA and associated risk factors. Regarding previous research, from a psychological perspective, an individual may develop significant anxiety if they utilize inadequate stress-coping mechanisms (Ahmed et al., 2021; Duko et al., 2019). Also, individuals are predisposed to developing significant anxiety because of social risk factors, including their perception of the adequacy of social supports received (perceived social support), supports inherent within marital or employment relationships (Duko et al., 2019b; Tesfaw et al., 2016), or conferred better access to support as a result of a higher level of education (Campos et al., 2010). Finally, From a psychosocial perspective, the extent to which exposure to HIV-related stigma in PLWHA exists may also influence the occurrence of significant symptoms of anxiety (Ahmed et al., 2021; Armoon et al., 2022; Tesfaw et al., 2016) as well as the presence of depressive symptoms (Camara et al., 2019; Tesfaw et al., 2016). At the individual biological level, behavioral patterns such as substance use (Ahmed et al., 2021), as well as a person's age (Ahmed et al., 2021; Camara et al., 2019; Olatayo Adeoti et al., 2018), sex (Bedaso et al., 2016; Tesfaw et al., 2016), the level of HIV viral load suppression (Ahmed et al., 2021; Cohen et al., 2002),high anxiety sensitivity (Brandt et al., 2017b; Gonzalez et al., 2010) might contribute to developing clinically significant or significant anxiety, as illustrated in Figure 1

Risk Factors:

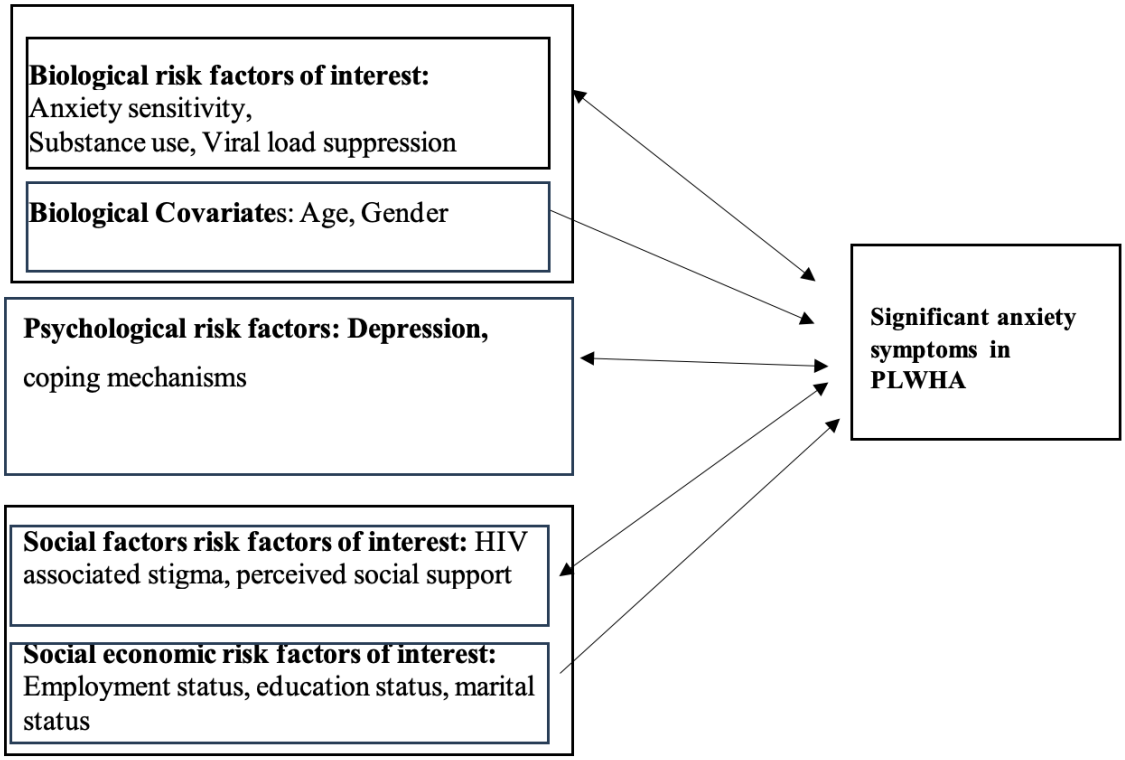


Figure 1 : The conceptual framework illustrating independent and outcome variables of interest using an adaptation of the Biopsychosocial Model (Wright et al., 2019).

1.4 Study Rationale

This study aims to determine the prevalence of significant anxiety symptoms and associated factors among adult persons with HIV/AIDS (PLWHA) in Moshi municipal, Kilimanjaro region. The information obtained from this study will inform the health care managers and providers on the burden of significant anxiety symptoms and associated factors among adult PLWHA. Through this, study findings may showcase the need for early diagnosis of anxiety disorder by identifying and assessing for diagnosis PLWHA screening positive for significant anxiety symptoms. In addition, identified risk factors for significant anxiety symptoms may help raise the index of suspicion of an anxiety disorder and strengthen the quality of services provided by HIV care and treatment clinics.

1.5 Research Questions

1.5.1 Broad research question

What is the prevalence of significant anxiety symptoms and the associated risk factors among adult PLWHA attending selected care and treatment clinic (CTC) centers in Moshi municipality, Kilimanjaro Region?

1.5.2 Specific research questions

1. What is the prevalence of significant anxiety symptoms among adult PLWHA attending CTC centers in the Moshi Municipality, Kilimanjaro region?
2. What are the biological risk factors (age, gender, anxiety sensitivity, viral load suppression, and substance use) for significant anxiety symptoms in adult PLWHA attending selected care and treatment clinic (CTC) centers in Moshi municipality, Kilimanjaro Region?
3. What are the social risk factors (HIV-associated stigma, perceived social support, employment status, level of education, and marital status) for significant anxiety symptoms in adult PLWHA attending selected care and treatment clinic (CTC) centers in Moshi municipality, Kilimanjaro Region?
4. What are the psychological risk factors (depression, coping mechanism) for significant anxiety symptoms in adults PLWHA attending selected care and treatment clinic (CTC) centers in Moshi municipality, Kilimanjaro Region?

1.6 Objectives

1.6.1 Broad Objective

To determine the prevalence of significant anxiety symptoms and its associated factors among adult PLWHA attending selected CTC centers in Moshi municipality, Kilimanjaro Region.

1.6.2 Specific Objectives

1. To determine the prevalence of significant anxiety symptoms among adult PLWHA attending CTC centers in Moshi municipality, Kilimanjaro region.
2. To determine the association between biological risk factors (age, gender, anxiety sensitivity, viral load, and substance use) and significant anxiety symptoms among adults PLWHA attending selected care and treatment clinic (CTC) centers in Moshi municipality, Kilimanjaro region
3. To determine the association between psychological risk factors (depression, coping mechanism) and significant anxiety symptoms among adults PLWHA attending selected care and treatment clinic (CTC) centers in Moshi municipality, Kilimanjaro region.
4. To determine the association between social risk factors (HIV-associated stigma, perceived social support, employment status, level of education, and marital status) and significant anxiety symptoms among adults PLWHA attending selected care and treatment clinic (CTC) centers in Moshi municipality, Kilimanjaro region.

1.7 Hypothesis

1.7.1 Null hypothesis

There is no association between anxiety risk factors identified from the literature and screening positive for significant anxiety symptoms in adult PLWHA accessing the CTC clinic in Moshi municipality, Kilimanjaro region.

1.7.2 Alternative hypothesis

There is an association between the anxiety risk factors identified from the literature and screening positive for significant anxiety symptoms in adult PLWHA accessing the CTC clinics in Moshi municipality, Kilimanjaro region.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 The prevalence of anxiety among PLWHA

There is a bidirectional relationship between HIV/AIDS and anxiety; this means HIV/AIDS increases the risk of significant anxiety and vice versa (Brandt et al., 2017). This bi-directionality is explained in part by the biological mechanisms in the inter-relationship between HIV/AIDS and anxiety mediated by the Hypothalamic-Pituitary-Adrenal Axis and Sympathetic-Adrenal-Medullary Axis (Brandt et al., 2017). These mechanisms affect HIV and anxiety, leading to long-standing inflammation and elevated levels of anxiety disorders (Brandt et al., 2017). A systematic review and meta-analyses show a pooled prevalence of 25% of significant anxiety symptoms in PLWHA globally (Rahmati et al., 2021). Studies in Italy and the United Kingdom show a 47% and 34% prevalence of significant anxiety among PLWHA assessed using the Self-Rating Anxiety Scale and the Hospital Anxiety and Depression Scale (HADS), respectively (Rahmati et al., 2021). These significant anxiety prevalence rates are high compared to those in the United States of America (USA), reported at 19.2%, assessed using the Generalized Anxiety Disorder Screener (GAD-7) (Algarin et al., 2021).

Some evidence of the prevalence of significant anxiety symptoms in PLWHA has been reported from the African continent, where 2/3^{rds} of PLWHA reside (UNAIDS, 2013). For example, the prevalence of significant anxiety symptoms assessed using the Hospital Anxiety and Depression Scale (HADS) was 13.8% in Guinea (Camara et al., 2019) and estimated higher at 32.6% in Nigeria using the same measure (Olatayo Adeoti et al., 2018). Using the Beck Anxiety Scale in Ethiopia, the prevalence of significant anxiety symptoms was 17.4% (Bedaso et al., 2016). Most studies on the prevalence of significant anxiety symptoms among PLWHA in the Eastern African region have focused on adult PLWHA (Kuringe et al., 2019; Leis et al., 2021; Ngocho et al., 2019). In Northern Tanzania, where the proposed study will occur, the prevalence of significant anxiety symptoms among adult PLWHA measured using the Brief Symptom Inventory (BSI) was 37.8% (Knettel et al., 2021). In an Eastern Tanzania provincial town in a population of PLWHA accessing care aged 16 years and above, the prevalence of mixed anxiety and depression was 15.5%, and

other anxiety disorders 4.5%, measured using a diagnostic tool, the Clinical Interview Schedule Revised (CISR) (Marwick & Kaaya, 2010). Anxiety and depression symptoms often co-occur in PLWHA (Duko et al., 2019; Marwick & Kaaya, 2010). In African samples, rates of comorbid anxiety and depressive symptoms range from 8.1% to 24.5% in Ethiopia and Guinea, respectively (Camara et al., 2019; Tesfaw et al., 2016). While variations in significant anxiety symptom rates are evident, they are noted to be substantial (above 3%) in the African context of adults living with HIV, and this is suggestive of a public health concern (Olatayo Adeoti et al., 2018; Tesfaw et al., 2016; Truong et al., 2021). The variations in rates across studies could also be due to the variations in anxiety symptom assessment tools used and whether the tools are for screening or diagnostic purposes. There is, therefore, a need to also screen for depression symptoms when screening for anxiety symptoms in adult PLWHA.

There is an association between significant anxiety symptoms and HIV treatment outcomes in PLWHA (Whetten et al., 2013). PLWHA in a South African sample with significant anxiety symptoms compared to those without anxiety symptoms had a significantly lower CD4 count. PLWHA with significant anxiety showed a 35% greater decline in CD4 counts than those without significant anxiety (beta=−35.37, 95% CI=−55.80, −14.70) (Truong et al., 2021). Furthermore, in a US sample of PLWHA, participants with higher viral loads (VLs) were more likely to report clinically significant anxiety symptoms ($p<0.0005$) compared to those with lower VLs (Cohen et al., 2002), with a similar pattern reported in a Pakistan sample of PLWHA (Ahmed et al., 2021). Significant anxiety has also been associated with lower levels of ART adherence (Chaudhury et al., 2016; Parcesepe et al., 2018; Wykowski et al., 2019). For example, a systematic review and meta-analysis show PLWHA with significant anxiety had 59% higher odds of being defective in their ART adherence compared to those who did not report anxiety symptoms (Wykowski et al., 2019). Relatively little is known about the magnitude of anxiety and its associated factors in adults living with HIV accessing HIV care and treatment in Tanzania, partly due to a scarcity of studies in Tanzania focusing on the magnitude of clinically significant anxiety symptoms in adult PLWHA. Therefore, I seek to fill this gap by determining the prevalence of significant anxiety symptoms among adult PLWHA in the Moshi municipality of the Kilimanjaro region of Tanzania.

2.2 Factors associated with significant anxiety symptoms among adults PLWHA.

A synthesized review of the factors associated with significant anxiety symptoms among adult PLWHA derived from the literature is outlined in this section. These factors can be grouped into more biological ones and psychological, social, or both (psychosocial). They lend themselves well to a biopsychosocial theoretical framework for understanding risk factors.

a) Biological risk factors associated with significant anxiety symptoms in adults living with HIV.

Substance use: Substance use is associated with clinically significant anxiety symptoms among PLWHA. Studies conducted in Pakistan (Ahmed et al., 2021) and China (Chen et al., 2018) showed that PLWHA who were illicit drug users compared to those not had a 17% higher likelihood of having significant anxiety symptoms (AOR=1.17). Furthermore, users of illicit drugs score 4.7 points higher in anxiety scores (SE=1.64, P<0.01) than non-users. Similar studies have been reported in SSA; for example, in a Ghanaian population of adults aged 30 years and above who were living with HIV, the use of substances such as alcohol was associated with more than a 60% higher likelihood of screening positive for clinically significant anxiety symptoms (AOR=1.64) assessed using HADS compared to those who do not use alcohol (Omuojine et al., 2022). These studies suggest using licit and illicit drugs among PLWHA may be a risk factor for significant anxiety symptoms. Anxiety may also be a risk factor for substance use, or there may be a bi-directional relationship between the level of significant anxiety symptoms and substance use (Glantz et al., 2009). However, limited studies in Eastern Africa or Tanzania have explored associations between significant anxiety symptoms and substance use in PLWHA, hence the need to assess anxiety risk factors in this proposed study.

Age: In some studies, age has been associated with significant anxiety symptoms in PLWHA. Some reports from Nigeria show significant anxiety symptoms are more prevalent in younger than older PLWHA. (Olatayo Adeoti et al., 2018). In other low-and middle-income countries, similar findings have been observed. For example, in Pakistan, PLWHA aged 18 to 25 years were 5.3 times more likely to develop significant anxiety symptoms than older PLWHA, perhaps due to emerging adulthood being a window period for more rapid psychological and social development (Ahmed et al., 2021). A few studies

in SSA support this observation. In studies in PLWHA in Nigeria and Guinea that both used the HADS to assess significant anxiety symptoms, having a younger age was associated with a 2.8 times greater likelihood of significant anxiety symptoms than older age (Olatayo Adeoti et al., 2018). Little is known about the effect of age on significant anxiety symptoms among PLWHA in either Tanzania or East Africa as a whole.

Sex: Studies have highlighted females as more likely to have significant anxiety symptoms compared to males with HIV/AIDS (Wani & Sankar, 2017). Similar results are observed in African studies; for example, in Ethiopian females compared to males with HIV/AIDS, a three to more than an eight-fold higher likelihood of developing significant anxiety symptoms is reported. The studies showing a higher risk of significant anxiety in females compared to males suggest females were also more likely to report exposures to acute adverse life events, lower income, and have smaller social networks when compared to men (Bedaso et al., 2016; Tesfaw et al., 2016). These findings are similar to a study of Nigerian PLWHA, which shows that being female was significantly correlated with anxiety symptoms ($r=0.83$, $p<0.01$) compared to being male. Not much is known about sex as a risk factor for anxiety in Tanzania, hence the need for a better understanding of sex differentials in the presence of significant anxiety symptoms in PLWHA accessing services.

Anxiety sensitivity: Anxiety sensitivity (AS) is the extent to which individuals believe anxiety and anxiety-related sensations have harmful consequences (Erozkan, 2017). Assessing AS can identify risks for those with heightened responses to anxiety and arousal-based senses (Erozkan, 2017). Aspects of AS include physical, social, and mental fears of observable experiences of anxiety (Gonzalez et al., 2010). In some studies, anxiety sensitivity has been associated with significant anxiety symptoms in PLWHA, where reports show that among PLWHA, high levels of anxiety sensitivity are associated with higher anxiety symptom severity (Brandt et al., 2017; Gonzalez et al., 2010).

For example, in PLWHA in the USA, for every unit increase in the level of anxiety symptoms, AS concerns increased by 0.29 ($p<0.05$) after controlling for confounders (Capron et al., 2012). The same study also shows that anxiety sensitivity subscales were significantly related to depressive symptoms.

In contrast, the cognitive concerns of anxiety sensitivity are positively associated with an increase in suicidality among PLWHA (Capron et al., 2012). Psychosocial and pharmacological interventions can intervene in anxiety sensitivity and may decrease the risk of developing clinically significant anxiety symptoms among PLWHA (Gonzalez et al., 2010). Little is known about the associations between AS and significant anxiety symptoms among adults PLWHA in Tanzania or East Africa as a whole.

Viral Load and Anxiety: Reports from high-income countries show that patients who report having high viral load (VL) also report having higher anxiety symptom severity (Shacham et al., 2012). For example, in a study in the USA, PLWHA with higher viral loads were more likely to develop significant anxiety symptoms than those with lower viral loads (Cohen et al., 2002). Similar results were observed in LMIC, whereby in Pakistan, PLWHA with detectable viral load were three times more likely to develop anxiety symptoms than those with an undetectable viral load (Ahmed et al., 2021). In Africa, associations between significant anxiety severity and CD4 count among PLWHA are documented; PLWHA with low CD4 counts were 35% more likely to present with significant anxiety symptoms than those with higher CD4 counts (Truong et al., 2021). Little is known about the effect of viral load on significant anxiety symptoms among adult PLWHA in either Tanzania or East Africa as a whole.

b) Psychological risk factors associated with significant anxiety symptoms in adults living with HIV

Coping mechanism: The types of coping mechanisms one employs when HIV-positive have been associated with reporting significant anxiety symptoms (Rivera-Picón et al., 2022). Studies in SSA show high levels of maladaptive coping were associated with significantly greater anxiety symptoms severity (Parcesepe et al., 2023). A study done in India showed that an acceptance coping strategy was protective against anxiety (Kaur & Kumar, 2018). Also, the same results are shown among women living with HIV in Indonesia, where implementing an intervention to improve coping strategies such as problem-solving skills, reduced the severity of anxiety symptoms (Maria Karouw et al., 2021). In a small study in Tanzania (N=135), PLWHA who opted for avoidant coping strategies were 0.57 ($b = 0.57$, $p < 0.001$) times more likely to have anxiety symptoms compared to those who used more adaptive coping strategies (Stiglitz et al., 2012). More

studies are needed in Tanzania and East Africa to understand better the associations between coping mechanisms and anxiety symptom severity among adults with PLWHA to better inform aiming to increase adaptive coping interventions.

Depression: Symptoms of depression are associated, in literature, with clinically significant anxiety symptoms. Such association means that depression and anxiety may co-occur among PLWHA. Evidence reported from the USA suggests that 40% of PLWHA enrolled in a study had comorbid anxiety and depressive symptoms (Sowa et al., 2016). These findings of anxiety and depression comorbidity, though rarely explored in African samples, have been reported in East Africa, with the prevalence of anxiety comorbid with depressive symptoms ranging from 8.1% to 24.5% (Camara et al., 2019; Tesfaw et al., 2016). In a Tanzanian study (Marwick & Kaaya, 2010), the prevalence of mixed anxiety or depression comorbid with anxiety was 15.5%. These findings are similar to those from studies in Guinea, Nigeria, and Ethiopia (Camara et al., 2019; Olatayo Adeoti et al., 2018; Tesfaw et al., 2016). Since evidence exists for the co-occurrence of anxiety and depression symptoms in the African context, there is a need to adjust for symptoms of depression in analyses determining risk factors for significant anxiety symptoms in adult PLWHA in the Tanzanian context.

c) Social risk factors associated with significant anxiety symptoms in adults living with HIV:

Perceived social support: Perceived social support is known to be associated with the severity of mental disorders (Galvão, 2016). In low and middle-income countries, some reports show low or moderate, compared to higher levels of social support, have been associated with clinically significant anxiety symptoms among PLWHA. For example, in Pakistan, patients reporting low social support were 70% more likely to screen positive for significant anxiety symptoms than those with good social support (Ahmed et al., 2021). In SSA, some studies have explored associations between social support and significant anxiety symptoms in PLWHA, for example in Ethiopia, perceived adequate social support was a protective factor against anxiety among PLWHA (Duko et al., 2019) as PLWHA with poor social support was almost seven times (OR 6.6) more likely to screen positive for significant anxiety symptoms compared to those reporting good social support. In Tanzania, Similar findings have been observed. In 135 adults Tanzanian PLWHA, those

reporting good social support were 30% (b = -0.30, p = 0.001) less likely to screen for anxiety symptoms than those with poorer social support (Stiglitz et al., 2012). Hence a need for more studies to assess the association between perceived social support and anxiety symptoms severity among PLWHA in Tanzania.

Stigma: HIV-related stigma has been reported to be associated with poor mental health outcomes among PLWHA (Rueda et al., 2016). A systematic review across WHO regions shows PLWHA diagnosed with anxiety were 1.89 times more likely to report HIV-related stigma than those not diagnosed with significant anxiety symptoms (Armoon et al., 2022). These findings of associations between significant anxiety symptoms and HIV-related stigma in PLWHA are consistent with reports from high-income countries. For example, in the USA, PLWHA who experienced HIV-related stigma (enacted stigma) were 3.36 times more likely to develop anxiety symptoms than those who have not experienced HIV-related stigma (Algarin et al., 2021). These findings were similar to Ethiopia, where PLWHA reporting experienced stigma were four times more likely to be diagnosed with significant anxiety symptoms than those who had not experienced stigma (Tesfaw et al., 2016). There is limited literature on the associations between stigma and anxiety symptoms among adults living with HIV in Tanzania. However, studies among pregnant women and adolescents living with HIV show that those endorsing experienced stigma were at an increased risk of developing significant anxiety symptoms and having increased emotional-behavioral disorder threshold scores on the Strengths and Difficulties Questionnaire (SDQ>17) respectively (Ngocho et al., 2019., Dow et al., 2016;)

Socio-economic status: Clinically significant anxiety symptoms are associated with poor socio-economic status. A study using the HADS shows that unemployed PLWHA in Brazil and Ethiopia experience more anxiety symptoms than employed patients (Campos et al., 2010; Tesfaw et al., 2016). Furthermore, PLWHA reporting low income were more likely to endorse anxiety symptoms than those with higher income (Tesfaw et al., 2016). Studies have shown that education level plays an essential role in understanding mental health in PLWHA. PLWHA with low education levels are reported to have more severe anxiety symptoms than those with higher education levels (Campos et al., 2010). Little is known about the socio-economic risk factors for clinically significant anxiety symptoms in PLWHA accessing care in Tanzania.

Marital status: The status of being single or divorced and widowed in PLWHA has a very close relationship with common mental health disorders such as anxiety. Married PLWHA may have a higher possibility of receiving social support and have a better quality of life than PLWHA that are single or divorced. Being single, divorced, or widowed is associated with clinically significant anxiety symptoms in PLWHA in Ethiopia compared to PLWHA that are married (Tesfaw et al., 2016). However, other studies on SSA samples have shown that marital status in PLWHA is not significantly associated with significant anxiety symptoms (Duko et al., 2019b; Omuojine et al., 2022). In Tanzania, little is known about the associations between anxiety symptoms and marital status among PLWHA.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Design

This hospital based cross-sectional analytical study design used quantitative methods to determine the prevalence of significant anxiety and associated factors among adults PLWHA attending CTCs in Moshi municipal, Kilimanjaro Region as done in other studies in SSA (Camara et al., 2019; Olatayo Adeoti et al., 2018; Tesfaw et al., 2016).

3.2 Study Area and Setting

The study sites were CTCs in Moshi, Kilimanjaro region. Moshi Municipal Council is one of seven districts located in the Kilimanjaro region, with a population of 1,996,952 people and an area of 58 square kilometers (NBS, 2022). The municipality has 21 wards in urban and peri-urban areas and 19 HIV CTCs serving 800-1,200 clients per week. The services provided at CTCs are integrated into all health facilities, from higher tertiary care to the lower primary care levels (TDHS, 2023). Trained medical staff provide a number of services, for PLWHA including counseling and testing for HIV/AIDS, community awareness campaigns for HIV/AIDS testing and treatment, initiation of anti-retroviral therapy (ARTs), clinical management of opportunistic diseases, and psychosocial support (TDHS, 2023). Four (4) CTC centers, namely the Kilimanjaro Christian Medical Center (KCMC), Mawenzi Regional Referral Hospital (MRRH), Pasua, and Majengo Health Centers, were selected as study sites to allow for adequate representation in the study sample of clients accessing HIV services at different levels of the health care delivery system.

3.3 Study Population

The study population were all adults (≥ 18 years) attending the CTCs in Moshi municipal who had been diagnosed with HIV and provided written informed consent and met the study inclusion criteria.

Inclusion criteria

1. Out-patient clients registered to receive CTC services (who had a CTC ID number) who were 18 years and above
2. CTC-registered PLWHA who have been initiated on ART for at least six months.
3. PLWHA who attended a scheduled CTC clinic visit during study data collection.

Exclusion criteria

1. PLWHA who were too ill to participate.

3.4 Sample Size Calculation

The prevalence (P) of clinically significant anxiety symptoms among adults living with HIV/AIDS in Tanzania was 37.8% from a survey by Knettel et al., 2021. I used this prevalence in my assumptions for sample size estimation. I calculated the sample size based on the equation from Cochran's formula for a dichotomous outcome as shown below:

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

Whereby:

N= estimated sample size

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

P= Prevalence of Anxiety among PLHIV was 37.8% in Tanzania in a study by Knettel et al., 2021

d= Margin of error at 5%

Hence, according to the formula above

$$N=\frac{1.96^2*0.378(1-0.378)}{(0.05)^2}$$

N= 361

Adjusting for non-response and finite population size we added 10%; hence, the estimated sample size (N) was 397. Cluster sampling was used; therefore, we adjusted for this design effect (Alimohamadi & Sepandi, 2019) using the intra-cluster correlation (ICC) of 0.005 taken from a study by Adams et al. (2004)

DEFF= $1+ \gamma (n-1)$

Whereby:

DEFF= Design effect

γ = Intracluster correlation

n= Average number of subject samples per cluster calculated in the sampling procedure

DEFF= 1+ 0.005(100-1)

DEFF= 1.495

Final sample size = DEFF *N

Final sample size= 1.495*397

After adjusting for the design effect, the estimated sample size was **593**

3.5 Sampling Procedure and Techniques

Multistage cluster sampling was applied to select four (4) among 19 CTCs in the Moshi municipality. The facilities were stratified to include CTCs located at all levels of the health care delivery system in Tanzania, including; tertiary, secondary, and primary health facility levels. At the tertiary level, the Kilimanjaro Christian Medical Center (KCMC) was included; for the secondary level, the Mawenzi Regional Referral Hospital (MRRH) was included. These are the only tertiary and secondary-level healthcare facilities in the municipality. At the Primary level, Pasua and Majengo Health Centers were randomly selected from a list of large CTCs, defined as CTCs with more than 1,000 registered clients. From the municipal CTC2 database, 2,645, 3,883, 1,083, and 1,347 clients were registered at KCMC, MRRH, Pasua, and Majengo Health Centers, respectively. The number of clients enrolled in each facility was determined by the probability proportional to the size of each facility using the ratios of 0.29:0.43:0.12:0.15, respectively. Thus, 175, 262, 66, and 90 clients were enrolled from KCMC, MRRH, Pasua, and Majengo health centers, respectively, meeting the minimum sample size of 593.

The study team used a systematic random sampling approach to select and enroll participants at study facilities. Within 21 days of data collection, we enrolled eight clients per day at KCMC (13 days), MRRH (three days), Pasua Health Center (three days), and five days at the Majengo Health Center to meet the minimum sample size. The study principal investigator (PI) and researcher assistants (RA's) generated a random number every morning for each facility (>0 and <9 for KCMC, <14 for MRRH and <4 for Pasua, and <6 for Majengo) to identify the first client to be enrolled at each facility. The next

participant enrolled was after every 3rd client for KCMC, MRRH, and Majengo and every 5th client for Pasua Health Center. Oversampling was done across the data collection days to accommodate those who refused to participate. About 96% agreed to participate in this study. Reasons for refusal to participate for 24 (4%) PLWHA were time constraints (n=16; 67%) and needing to go for investigations such as viral load (n=8; 33%). Trained research assistants (RA's) with medical backgrounds, consented participants, enrolled them, and conducted the interviews with the study PI. We introduced the study briefly before administering the interviews in the Kiswahili language. At the end of the interviews, the study team thanked each participant and helped them navigate clinic services. For privacy, all interviews were conducted in empty consultation rooms to ensure privacy, and the process did not interfere with the clinics' routine activities.

3.6 Variables

The dependent variable was significant anxiety symptoms equivalent to probable generalized anxiety disorder.

Independent variables of interest were:

- Biological: depression, substance use, viral load suppression, and anxiety sensitivity
- Psychological: Coping mechanism
- Social: Perceived social support, and HIV- related stigma

Sociodemographic covariates included age, sex, employment status, education level, and marital status.

3.7 Data Collection Tools

The data collection tools were translated into Kiswahili. All the tools were interviewer-administered by the Principal Investigator (PI) and Research assistant (RA). The tools included a Social Demographic Questionnaire, the Generalized Anxiety Disorder-7 item screener (GAD-7), Duke-UNC Functional Social Support Questionnaire (FSSQ), the HIV/AIDS Stigma Instrument (HASI), the Short Scale Anxiety Sensitivity Index (SSAI), the nine items Patient Health Questionnaire 9 (PHQ-9), and the Brief Cope. These tools were compiled into one clinical research form. Tools that have not been previously used in

Tanzania (the Short Scale Anxiety Sensitivity Index (SSAI) and the Brief COPE) were translated.

3.7.1 Social demographic factors associated with significant anxiety symptoms were measured using a structured interview schedule containing information on the participant's age, sex, marital status, education level, employment status, and substance use in the past twelve month.

3.7.2 Medical records, such as patient files and CTC2 cards, were used to extract the most recent viral load and date of blood draw for viral load tests against the CTC numbers of clients scheduled to visit on assigned data collection days.

3.7.3 Duke-UNC Functional Social Support Questionnaire (FSSQ) was designed to assess perceived social support (Broadhead et al, 1988). The scale has 14 questions scored on a five-point scale with responses ranging from 1 to 5 (never, much less than I would like, less than I would like, and much as I would like). For this study, scores were divided into tertiles to create equally weighted ordinal levels from low (14-23.3), average (23.4-46.6), and good (46.7-70) social support. The FSSQ has demonstrated good construct validity and good reliability at Cronbach's alpha 0.92 (Broadhead et al, 1988)

3.7.4 Generalized Anxiety Disorder-7 (GAD-7) was used to determine the symptoms and severity of generalized anxiety disorder. The GAD-7 is a 7-item questionnaire that asks for experiences with anxiety symptoms in the past two weeks. The total score (range 0-21) was calculated by assigning scores of 0 to 3 to the response options of "not at all," "several days in the past two weeks," "more than half the days in the past two weeks," and "nearly every day in the past two weeks," respectively. After adding scores, the sum scores of 5, 10, and 15 were taken as the cut-off points for mild, moderate, and severe anxiety, respectively. Those screened with a score of 10 or greater needed more evaluation. Cut-off scores for significant anxiety were ≥ 10, with a sensitivity of 89% and specificity of 73%. The scale reliability was adequate at ICC =0.70 with good internal consistency, Cronbach's alpha of 0.82. The Swahili version has been validated in Kenya among adults with HIV/AIDS (Nyongesa et al., 2020).

3.7.5 The Brief COPE was used to assess different coping strategies. The Brief COPE assessed 14 coping domains with two items each (28 items). For each item, respondents were required to indicate whether they use the coping response on a four-point Likert scale (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). The Brief COPE scores was summarized to determine adaptive and maladaptive coping strategies. Adaptive coping included the following coping strategies: active coping, use of emotional supports, instrumental supports, positive reframing, religiosity, planning, acceptance, and humor. In contrast, maladaptive coping strategies included self-blame, venting, behavioral disengagement, and denial. A sum score was calculated separately for the adaptive and maladaptive subscales categorized into tertiles based on distribution in the population (Parcesepe et al., 2023). In India, the scale reliability was adequate at 0.61 and construct validity at alpha =0.7 (Mohanraj et al., 2015).

3.7.6 Short-Scale Anxiety Sensitivity Index (SSASI) was used to assess anxiety sensitivity with five (5) items measuring the degree to which individuals fear the negative consequences of anxiety symptoms. Items were rated on a scale of 0 (very little) to 4 (very much) and summed to create a total score, with higher scores indicating greater anxiety sensitivity. Then 1.5 standard deviation (SD) above mean was used to categorize whether low or high anxiety sensitivity (Zvolensky et al., 2018). SSASI had good internal consistency (alpha = 0.81). Also, it has shown excellent convergent and discriminant validity (Zvolensky et al., 2018).

3.7.7 Patient health Questionnaire 9 (PHQ-9). PHQ-9 was used to assess depressive symptoms and comprises nine items. Each item can be scored from 0 (no symptoms at all) to 3 (symptoms nearly every day), with a maximum score of 27. The PHQ-9 has several cut-off points to indicate the severity of symptoms. The cut-off scores commonly used are 0-4 to indicate minimal severity, 5-9 (mild), 10-14 (moderate), 15-19 (moderately severe), and 20+ (severe symptoms) with a score greater than or equal to 9 is equivalent to a major depressive episode. This tool has been adapted in the Tanzanian context and has been translated into Kiswahili and validated, showing very good internal consistency values – Cronbach's alpha of 0.83 with

good construct validity and detected DSM IV equivalent major depression at a cut-off score of ≥9 with 78% sensitivity and 87% specificity (Smith Fawzi et al., 2019).

3.7.8 HIV/AIDS Stigma Instrument (HASI): HASI was used to assess HIV-related stigma, using 12 items. Items include concerns about personalized stigma, negative self-image, disclosure, and public attitude concerns. It is rated on a four-point scale from ‘‘1–Strongly disagree’’ to ‘‘4–Strongly agree’’ for a total score of 12-48, with higher scores indicating higher anticipated stigma. The cut-off points of greater than or equal to 30 was used to indicate high perceived HIV stigma and a score of less than 30, indicated low perceived HIV stigma (Alemu et al., 2022). It has been validated in Tanzanian adults where HASI had good construct validity and reliability was adequate at Cronbach’s alpha of >0.70 (Holzemer et al., 2007). (Holzemer et al., 2007).

3.8 Data Analysis Plan

STATA version 15 was used to enter and clean the data. The sample’s social demographic and clinical characteristics were summarized using descriptive analysis (means, standard deviation for continuous variables, and frequencies for categorical variables).

Significant anxiety, as an outcome measure, was dichotomized into the presence of significant anxiety symptoms if the GAD- 7 score was ≥10 and the absence of significant anxiety symptoms if the score was <10 (Nyongesa et al., 2020), anxiety prevalence was reported for the total sample and by sex. The bivariate analysis identified the social demographic and risk factors of interest that vary by clinically significant anxiety symptoms at p-values of ≤0.2 for inclusion into the multivariate analysis. Multivariate analyses using logistic regression models adjusted for sampling weights determined the independence of risk factors and potential confounders by regressing risk factors identified to be significant in the bivariate analyses on the binomially summarized generalized anxiety measure. In this model, adjusted odds ratios (AOR) were presented for items with significant variations (p-value is < 0.05) with respective 95% confidence intervals.

3.9: Recruiting and training of research assistants

Four (4) research assistants received training on assessment tools and assisted in data collection. The PI participated in data collection and sampling procedures at CTCs.

3.10 Pre-Testing of Data Collection Tools

In May 2023, locally adapted Swahili measures were sought from authors who have culturally adapted and validated measures for use in the Tanzanian or East African context. In May 2023, For two measures, the Brief Cope and the Anxiety Sensitivity Index, the original English data collection tools were translated to Swahili first: forward translation to Swahili, followed by independent back translation to English by a person unfamiliar with the original tool. A panel comprising the principal investigator, a clinician in mental health, and a nurse reviewed a discrepancy report of the original and back-translated English versions to check for discrepancies that signify changes in the meaning of items in the original English version after back-translation. Items with discrepancies were reviewed, discussed, and corrected to ensure meanings in the original English version were captured in the Swahili version. In a sample of 30 adult PLWHA (15 male and 15 female) at the Muhimbili National Hospital HIV CTC the Swahili tool was piloted for face validity and finalized for fieldwork in the Kilimanjaro region.

During each interview short field notes were collected of questions with probes to participants on what items were difficult to respond to, what made them difficult to respond to, and questions asked on how best the difficult item should be worded in Swahili to improve clarity, after providing information on what the item seeks from participants these field notes were used in a second-panel discussion with a linguist to finalize the two measures. To avoid bias and repetition of the participants participating in the study, we used a study-specific unique ID and the CTC2 unique ID numbers from the clinic's routine clinical data base. The CTC2 unique IDs were used to capture information on the most recent viral load results from the CTC2 routine database.

Findings from this study will be disseminated by publishing a manuscript. Also, the findings will be relayed back to the CTC centers to inform them of their clinical care.

3.11 Ethical Issues and Research Clearance

The MUHAS Senate Research and Publications Committee provided the ethical clearance, while permission to conduct the study was sought from the Municipal Health Office and Medical Officers in Charge of the respective CTC clinics. All participants were verbally informed about the research and provided with information on what participation would entail and the potential risks and benefits. Invited PLWHA were also informed that their participation is voluntary. They have the right to refuse to participate in the study and can request to withdraw from the study at any point after consenting, and this will not bear any consequences to them in terms of the services they receive at the clinic. They were made aware that they may decline to answer a question that they were uncomfortable with. Participants were assured of the confidentiality of the information they provided as the questionnaire had a unique number and not the client's name, assuring that the information they provided could not be linked to them personally in reports, and the information collected on forms was stored in a locked cabinet prior to being entered on a password protected computer that is accessible only to the research team. Participants were then asked to read the consent form and sign it to ensure written informed consent was attained from those agreeing to participate**.** Those who were diagnosed to have clinically significant anxiety symptoms with a cut-off point of ≥10 were referred to the mental health and psychiatric clinic of their respective or nearby facilities.

CHAPTER FOUR

4.0 OVERVIEW OF THE RESULTS

This chapter explains the results of the in-depth analyses of the collected data. The chapter starts by presenting the results in accordance with the research questions. It displays the findings regarding the prevalence of significant anxiety symptoms and associated factors in adult people living with HIV/AIDS (PLWHA) in care and treatment clinic (CTCs) centers in Moshi municipal, Kilimanjaro region. Results adopted the alternative hypothesis. This research involved 593 participants, with a 100% response rate among those who were enrolled.

4.1 Socio-demographic characteristics of the study participants:

Table 1 summarizes the frequency distribution of socio-demographic characteristics of study participants. Of 593 participants, the highest number (44.2%) were enrolled at the secondary health facility and the mean age of the participants was 47.5 (SD=13.2) years with an age range of 18 -90 years. Most of the participants were female (72.3%), more than a third were married or cohabiting (41%), more than two-thirds had none or primary education, (69.7%), and over three-quarters were employed or self-employed (77.4%).

Table 1 : Frequency distribution of socio-demographic characteristics of adult people living with HIV/AIDS (PLWHA) in care and treatment clinics (CTCs) in Moshi municipal, Kilimanjaro region in 2023 (N=593)

Characteristics	Frequency (n)	Percentage (%)	Mean	SD
Site level				
Primary	156	23.3		
Secondary	262	44.2		
Tertiary	175	29.5		
Age group (years)			**47.5**	**13.2**
18-24	36	6.1		
25-44	185	31.2		
45-60	276	46.5		
>60	96	16.2		
Sex				
Male	164	27.7		
Female	429	72.3		
Level of education				
None or Primary	413	69.7		
Secondary or higher	180	30.3		
Marital status				
Single	129	21.8		
Cohabiting/married	243	41		
Divorced/widowed	221	37.2		
Employment status				
Unemployed	134	22.6		
Employed/Self employed	459	77.4		

KEY: SD= standard deviation

4.2 Description of clinical and psychosocial characteristics of study participants

Clinical characteristics: Less than a fifth had comorbid probable depression (n=97; 16.4%) and high anxiety sensitivity (n=62; 10.5%), while a fifth (n=120; 20.2%) had detectable viral load with a median viral load of 20 copies/ml as summarized in Table 2.

Psychosocial characteristics: Nearly half of the study participants (49.1%; n=291) had used substances in the past twelve months, with minority (9.6%; n=57) reporting a high level of perceived social support. More than a quarter (27.3%; n=162), reported relatively high levels of perceived HIV-related stigma, with nearly a third of participants (32.2%, n=191) and (32.5%, n=193) reporting high levels of both adaptive and maladaptive coping strategies respectively as summarized in Table 2.

Table 2 : Clinical and psychosocial characteristics of respondents among adult people living with HIV/AIDS (PLWHA) in care and treatment clinic (CTCs) centers in Moshi municipal, Kilimanjaro region in 2023 (N=593)

Characteristics	Frequency (n)	Percentage (%)	Median	IQR
Substance use				
No	302	50.9		
Yes	291	49.1		
Probable Depression				
No	496	83.6		
Yes	97	16.4		
Viral Load				
Not detectable (≤20 copies/ml)	473	79.8		
Detectable (>20 copies/ml)	120	20.2		
Anxiety sensitivity			0	0-3
Low (0-7.4)	531	89.5		
High (7.5-20)	62	10.5		
Perceived social support			25	15-36
Low (14-23.3)	389	65.6		
Average (23.4-46.6)	147	24.8		
Good (46.7-70)	57	9.6		
Perceived stigma			24	19-30
Low (0-29)	431	72.7		
High (30-48)	162	27.3		
Coping Mechanisms				
Adaptive coping mechanism tertiles			43	33-50
Low (16-37)	198	33.4		
Medium (38-47)	204	34.4		
High (48-61)	191	32.2		
Maldaptive coping mechanism tertiles			19	16-23
Low (12-17)	213	35.9		
Medium (18-21)	187	31.6		
High (22-41)	193	32.5		

KEY: IQR: Interquartile range

4.3 Prevalence of significant anxiety symptoms

The prevalence of significant anxiety symptoms among adults' people living with HIV/AIDS in Moshi municipal, was 12.5 % (95% CI: 2.5-44.1). Significant anxiety prevalence rates among men and women were 11.59% (95% CI: 0.05-0.22) and 12.82% (95% CI: 0.01-0.53) respectively.

4.4 Bivariate analysis of factors associated with significant anxiety symptoms among the study participants:

Table 3 summarizes the results of the bivariate and multivariate analysis of factors associated with significant anxiety symptoms in adult people living with HIV/AIDS.

In unadjusted analyses, the study site, viral load, substance use in the past 12 months, probable depression, anxiety sensitivity, coping mechanisms, perceived social support, and HIV-associated stigma risk factors of interest were associated with significant anxiety symptoms at p-values less than or equal to 0.2.

Multivariate analysis of factors associated with significant anxiety symptoms among the study participants:

Logistic regression was performed for all independent variables associated with significant anxiety symptoms, with a p-value of less than or equal to 0.2 obtained during the bivariate analysis. Being treated at the tertiary health facility level, substance use, having probable depression, high anxiety sensitivity, good social support, and having low adaptive coping mechanisms were independently associated with significant anxiety symptoms with $P<0.05$.

Study participants attending the tertiary health facility level were seven times more likely to report significant anxiety symptoms (AOR 7.45; 95% CI: 6.14-9.04, P=0.00) compared to those attending at the primary health facility level. Participants who used substances in the last 12 months compared to those who did not, had almost five times higher likelihood of reporting significant anxiety symptoms (AOR=4.69; 95% CI: 1.12-19.53, P=0.03); while those screening positive for probable depression compared to those without depression had five times higher likelihood of reporting significant anxiety symptoms (AOR=5.09; 95% CI: 2.34-11.06, P=0.00). With regards to anxiety sensitivity (a trait

measure), participants with high, compared to low anxiety sensitivity had fifteen times higher likelihood of reporting significant anxiety symptoms (AOR=15.39; 95% CI: 3.88-61.14, P=0.00). Furthermore, those reporting low use of adaptive coping mechanisms had more than three times the likelihood of reporting significant anxiety symptoms (AOR=3.48; 955 CI: 1.43-8.46, P=0.01). However, having good social support increases more than three times the likelihood of developing significant anxiety symptoms (OR=3.35; 95% CI: 1.61-6.96, P=0.00) compared to those with low social support.

Table 3 : Bivariate and multivariate analysis of socio-demographic, clinical, and psychological factors associated with significant anxiety symptoms among people living with HIV/AIDS attending care and treatment clinic (CTCs) centers in Moshi municipal, Kilimanjaro

Variable	Significant Anxiety Symptoms; N=74 (%)	UOR; 95% CI	P-Value	AOR; 95% CI	P-Value
Site level					
Primary	11 (7.06)	**Ref**			
Secondary	19 (7.25)	2.88; 1.36-6.12	**0.01**	1.11; 0.74-1.64	0.6
Tertiary	44 (25.14)	6.78; 3.46-13.31	**0.00**	7.45; 6.14-9.04	**0.00**
Age group (years)					
18-24	6 (16.67)	2.2; 0.32-15.1	0.42		
25-44	33 (17.84)	2.38; 1.80-5.69	0.26		
45-60	27 (9.78)	1.19; 0.39-3.65	0.76		
60+	8 (8.33)	**Ref**			
Sex					
Male	19 (11.59)	**Ref**			
Female	55 (12.82)	1.12; 0.49-2.54	0.78		
Level of education					
None or Primary	51 (11.25)	**Ref**			
Secondary or higher	23 (12.78)	1.06; 0.81-1.40	0.63		
Marital status					
Single	14 (10.85)	**Ref**			
Cohabiting/Married	33 (13.58)	1.29; 0.76-2.21	0.93		
Divorced/widowed	27 (12.22)	1.14; 0.51-2.56	0.32		
Employment status					
Unemployed	21 (15.67)	1.42; 0.80-2.52	0.26		
Employed/ Self employed	53 (11.59)	**Ref**			

Substance use (≤ 12 *months*)					
No	13 (4.30)	**Ref**		**Ref**	
Yes	61 (20.96)	5.89; 1.31-26.50	**0.02**	4.69; 1.12-19.53	**0.03**
Probable depression					
No	23 (4.64)	**Ref**		**Ref**	
Yes	51 (58)	22.80;11.35-45.78	**0.00**	5.09; 2.34-11.06	**0.00**
Viral load					
Undetectable (≤20 copies/ml)	45 (9.51)	**Ref**		**Ref**	
Detectable (>20 copies/ml)	29 (24.17)	3.03; 1.12- 8.18	**0.02**	1.29; 0.27-6.30	0.75
Anxiety sensitivity					
Low (0-7.4)	30 (5.65)	**Ref**		**Ref**	
High (7.5-20)	44 (70.97)	40.82; 29.15-57.16	**0.00**	15.39; 3.88-61.14	**0.00**
Perceived social support					
Low (14-23.3)	33 (8.48)	**Ref**		**Ref**	
Average (23.4-46.6)	22 (14.97)	1.89; 1.16-3.10	**0.01**	1.34; 0.79-2.28	0.26
Good (46.7-70)	19 (33.33)	5.39; 3.31-8.76	**0.00**	3.35; 1.61-6.96	**0.00**
Perceived stigma					
Low (0-29)	44 (10.07)	**Ref**		**Ref**	
High (30-48)	30 (18.35)	2.01; 0.79-5.09	**0.14**	1.12; 0.69-1.80	0.63
Adaptive coping mechanisms					
Low (16-37)	28 (13.90)	1.45; 0.74-2.85	0.28	3.48; 1.43-8.46	**0.01**
Medium (38-47)	25 (11.92)	1.21; 0.88-1.68	**0.20**	1.55; 0.76-3.18	0.22
High (48-61)	21 (10.00)	**Ref**			
Maladaptive coping mechanisms					
Low (12-17)	14 (5.94)	**Ref**		**Ref**	
Medium (18-21)	19 (9.66)	1.69; 1.05-2.71	0.03	1.64; 0.95-2.84	0.07
High (22-41)	41 (21.43)	4.31; 3.90-4.77	**0.00**	2.52; 0.72-8.80	0.14

CHAPTER FIVE

5.0 DISCUSSION

This chapter discusses the findings of the study. The study's main objective was to determine the prevalence of significant anxiety symptoms and associated factors among adult PLWHA attending selected CTC centers in Moshi municipality, Kilimanjaro Region. The discussion will cover results from the study's univariate descriptive as well as bivariate and multivariate analyses depending on specific research questions.

5.1 Prevalence of significant anxiety symptoms

The prevalence of significant anxiety symptoms among adults PLWHA in CTC centers in Tanzania was 12.5%, using a GAD-7 screener cut-off score of 10. This prevalence is closely similar to the rates of significant anxiety symptoms among adults PLWHA in other African samples with rates of 9% and 13.8% in South Africa (assessed using the GAD-7 screener) and Guinea (assessed using HADS), respectively (Rane et al., 2018; Camara et al., 2019). However, other studies, report higher prevalence rates of significant anxiety symptoms in PLWHA when compared to this study's findings. For example, in Italy, and England, levels of self-rated and clinician-rated anxiety using the Hospital Anxiety and Depression Scale (HADS) among PLWHA, were 47% (Rahmati et al., 2021) and 34% respectively (Rahmati et al., 2021). These variations may be related to differences in anxiety screening tools used, cultural disparities in the expression of anxiety, and different inclusion criteria in studies across contexts.

5.2 Factors associated with significant anxiety symptoms

Factors associated with significant generalized anxiety symptoms in these findings included being treated at tertiary health facility levels, screening low on adaptive coping mechanisms, reporting substance use, screening positive for probable depression, high anxiety sensitivity levels, and good social support were risk factors for significant anxiety symptoms.

The report's findings were consistent with those of previous studies in India and Indonesia, where using less adaptive coping mechanisms was a risk factor for significant anxiety symptoms (Kaur & Kumar, 2018; Maria Karouw et al., 2021). This may suggest that practicing more adaptive coping mechanisms, such as acceptance and seeking social

support, significantly contributes to improved mental well-being in PLWHA. This may be due to being equipped with skills to manage emotions by actively addressing and finding solutions to challenges related to life and health stressors (Kaur & Kumar, 2018; Maria Karouw et al., 2021). Persons with adaptive coping skills may also be more likely to adopt positive health-related behaviors such as adhering to medications, hence reducing anxiety about the progression of the disease (Maria Karouw et al., 2021; Parcesepe et al., 2023). The findings suggest strengthening adaptive coping mechanisms may address a potentially intervenable risk factor for PLWHA with anxiety.

Being treated at the tertiary level of health facility was associated with higher odds of reporting significant anxiety symptoms compared to primary-level facilities. This may be explained by tertiary care level hospitals handling more complex patients, such as advanced stages of HIV/AIDS or additional health comorbidities contributing to higher anxiety levels. It is also possible that persons with generalized anxiety may be less able to adhere to medication and hence have more HIV disease progression with associated comorbidity (Shacham et al., 2012) that necessitates referral to secondary and tertiary levels of care. There is also evidence, particularly in low- and middle-income countries such as Tanzania, of inadequate provision of mental health services at lower-level healthcare services compared to higher-level centers, increasing the possibility of referral of PLWHA to tertiary levels with specialized mental health care, when significant anxiety symptoms are recognized. Finally, patients managed at tertiary hospitals might perceive their condition as being more severe due to the identified need for advanced medical services and specialized care, hence heightening their levels of illness-related anxiety.

Like the findings of this report, substance use was a significant predictor of significant anxiety symptoms in a Ghanaian (AOR=1.64; 95% CI: 1.13-2.38) and Pakistani (AOR=1.17, 95% CI: 1.03-2.55) population of adult PLWHA when compared to PLWHA who do not use substances (Ahmed et al., 2021; Omuojine et al., 2022). These studies both suggest the use of substances may be a risk factor for significant anxiety symptoms, also anxiety may be a risk factor for substance use as a coping strategy or due to their anxiolytic effects (Ahmed et al., 2021; Omuojine et al., 2022).

Being screened positive for probable depression had an association with significant anxiety symptoms. Studies in the USA and Ethiopia report similar associations ranging from 24.5% to 40% of PLWHA had comorbid anxiety and depressive symptoms (Sowa et al., 2016; Tesfaw et al., 2016). Authors note that factors such as psychological stress because of being diagnosed with a chronic disease, fear of stigma, and social isolation can lead to both disorders (Sowa et al., 2016; Tesfaw et al., 2016).

Having higher anxiety sensitivity traits in this study was strongly associated with significant anxiety symptoms. Other studies in England and the USA have reported similar associations (Gonzalez et al., 2010; Capron et al., 2012). Genetic predisposition is likely the cause of this observation and points out the need for psychosocial and pharmacological intervention. Also, PLWHA who have high anxiety sensitivity may be attuned to perceived bodily changes or adverse effects of ARVs, leading to increased anxiety about treatment and its impact on their well-being (Gonzalez et al., 2010; Capron et al., 2012). This is an important finding in terms of practice changes, as there are interventions to help individuals with high anxiety sensitivity to prevent the occurrence of generalized anxiety disorder.

However, the findings in this report did not align with other studies, such as in Pakistan and Ethiopia (Duko et al., 2019; Ahmed et al., 2021), where PLWHA who had good social support were more likely to screen positive for significant anxiety symptoms. This can be explained by the fact that in the African context, family members are one’s immediate support base, providing social, financial, and emotional support when persons suffer from a chronic disease such as HIV/AIDS hence, they tend to have consequently high expectations for a person's recovery. These expectations can lead to PLWHA having significant anxiety due to worries about being a burden to the family since they do provide extra support because of his/her illness. Also, the feeling of overprotectiveness from the care providers may be perceived as an infringement of privacy or social undermining, hence creating ambivalent relationships, which increases the risk of developing anxiety symptoms.

Predictors reported elsewhere to be associated with significant anxiety symptoms, such as age, sex, marital status, employment status, and perceived stigma, did not show significant association in the sample reported here. My findings are contrary to the findings from other studies, such as in Pakistan (Ahmed et al., 2021), Ethiopia (Tesfaw et al., 2016), and Brazil (Compos et al., 2010) that report sex, employment status, and perceived stigma were associated with significant anxiety symptoms. It is possible that these different findings may be due to socio-economic or cultural variations in our sample, compared to samples from Pakistan, Ethiopia and Brazil. However, bivariate analysis initially showed viral load, maladaptive coping strategies, and perceived stigma were initially associated with significant anxiety symptoms, after adjusting for other variables, these factors were no longer significant predictors of significant anxiety symptoms.

5.3 Study Limitations

- Due to the cross-sectional nature of this study, it is impossible to infer causality between the independent and dependent variables. Still, it can provide information about the likelihood of significant anxiety symptoms and point out risk factors that may be amenable to intervention.
- Bias:

  -Social desirability bias. The social-cultural norms surrounding the stigma of mental health may have limited the participants' intentions of sharing information on the presence of anxiety symptoms. The research team mitigated this by ensuring confidentiality and privacy during the interviews.

  -Recall bias; is a limitation since requires participants to remember information of anxiety symptoms from the past two weeks. This was mitigated by providing adequate time for response from the participants.
- Some of the side effects of ARVs such as fatigue can contribute to physical discomfort and psychological distress potentially leading to anxiety-like symptoms.
- Using the GAD-7 may confound the assessments because anxiety symptoms may be the result of the health diagnosis (i.e., HIV/AIDS), its progression, or related to general issues such as poverty, violence, and unemployment. This risk was mitigated by enrolling clients who have initiated ART and have been receiving medication for at least six months.

- The Brief Cope Scale and SSASI have not been culturally adapted and validated in the Tanzanian context. This was mitigated by steps addressed in the translation and back translation of the tools during the instrument pilot phase, and also a qualitative exploration of items that were difficult to respond to by PLWHA and got suggestions on alternative wording after describing the purpose of the item to participants. These pilot clients were not included in the sample of the main study.
- A systematic random sampling strategy was used to enroll participants on each study day hence the need of having a specific list of clients attending CTCs. Having multiple lists can be time-consuming. Also, the list may be difficult to access since they are protected by the privacy policy. This was mitigated by asking for permission to access the CTC2 database and appointed clients list.

5.4 Strength of the Study

- The study met the estimated sample size of 593 participants.
- There was a high response rate from the study participants.
- Both bivariate and multivariate analyses were conducted to determine the independence of the risk factors associated with significant anxiety symptoms in PLWHA attending CTCs.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Significant anxiety symptoms were found to be common among adult PLWHA in this study, with about one in eight people living with HIV/AIDS reporting having significant anxiety symptoms. Results from the survey show that being treated at the tertiary health facility level versus primary and secondary levels, using substances, having probable depression, high anxiety sensitivity, good social support, and having low adaptive coping mechanisms, were associated with significant anxiety symptoms. Therefore, screening for anxiety symptoms among individuals attending CTCs is recommended. Identifying individuals who screen positive for significant anxiety symptoms will allow for further diagnostic assessment and intervention among PLWHA.

6.2 Recommendations

Based on the findings of this research, this study recommends the following.

Service providers:

- As part of better integrating physical and mental health services, all patients attending CTCs should undergo routine screening for anxiety symptoms.
- Identifying early-in-care persons with high sensitivity and providing support that may prevent the development of generalized anxiety symptoms.

End users:

- It is important to PLWHA and primary caregivers to be made aware about the possibility of psychological concerns, given the chronicity of their illness, including how to identify anxiety symptoms and take appropriate action to seek help.

Research:

- Further research on PLWHA is needed, as well as prospective and qualitative studies to determine how PLWHA perceives mental health concerns and the standard of care they receive. These studies may help to identify any gaps in the current system of care from patients' perspectives.

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APPENDICES

Appendix I: Informed Consent Form - English version

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR OF RESEARCH AND PUBLICATIONS

To be read and questions answered in a language in which the study participant is conversant (English or Kiswahili)

My name is **Frank J. Kiwango** I am a Medical Doctor and currently pursuing my master's degree in Psychiatry at the **Muhimbili University of Health and Allied Sciences**. As part of my degree award fulfillment, I am conducting a study on the prevalence of significant anxiety symptoms and associated factors among PLWHA attending CTCs centers in Moshi municipality, Kilimanjaro region.

I would like to thank you for being interested in participating in this study as one of the clients attending CTC at this center. Participation will be at your own will, and you are free to take part or not. There will be no consequences if you decide not to participate or choose to withdraw from the study and there will be no effects on the treatment and other services that you receive here. The interview will take approximately 20 to 30 minutes of your time.

All the information that you provide will remain confidential and no names will be used in the questionnaire rather than codes.

Some of the questions in this questionnaire may be emotionally sensitive. If at any point this happens, you are free to pause or end the interview. You are also encouraged to ask any question in between the interview.

If you would like to talk to the mental health services providers or counsellors after the interview arrangements will be made.

There will be no direct benefit to you for participating in this study; however, the results obtained will help to provide an idea as to the magnitude of anxiety in this region and to help healthcare providers to offer better services.

After reading the explanation, don't hesitate to ask any questions in case you need clarifications, and they will be answered by the person doing the informed consent. For further clarification concerning this study, please feel free to contact the Principal Investigator, **Dr. Frank J. Kiwango, at 0757 754 071.**
Additionally, in case of any complaints based on this research, please forward your complaints to the Director of MUHAS Senate Research and Publications Committee, P.O Box 65001 Dar Es Salaam, Tel No.: +255 222151596

I have read and understood the above information. I understand that my participation is voluntary and that all information obtained will be used for this study only. All the questions that I asked have been responded to.

Client signature

…….

Tel number: ……...… Date: ……
(DD/MM/YYYY)

Appendix II: Informed Consent Form - Kiswahili version

Fomu ya Idhini Iliyoarifiwa

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

OFFICE OF THE DIRECTOR OF RESEARCH AND PUBLICATIONS

Isomwe na ijibiwe kwa lugha ambayo mshiriki anaielewa vizuri (Kiingereza au Kiswahili)

Mimi ninaitwa **Frank J. Kiwango** ni daktari wa binadamu na pia ninasomea udaktari bingwa wa afya na magonjwa ya akili katika chuo cha **Muhimbili cha Afya na Sayansi Shirikishi**. Ninafanya utafiti wa kuangalia jinsi tatizo la wasiwasi lilivoenea kwa watu wenye maambukizi ya virusi vya UKIMWI ambao wanapata matibabu katika kliniki mbalimbali katika manisipaa ya Moshi, mkoani Kilimanjaro kama moja ya utimizaji wa kuweza kupata shahada yangu ya udaktari bingwa.

Ningependa kukushukuru wewe kama mmojawapo wanaopata matibabu katika kliniki hii kwa kujitolea kushiriki katika utafiti huu. Ushiriki wako ni kwa maamuzi yako pekee, unaruhusiwa kushiriki au kukataa. Hakuna madhara yoyote yatakayotokea iwapo utakataa kushiriki au kujitoa kwenye utafiti huu, na matibabu unayopokea hapa hayatabadilika kwa vyovyote vile. Mahojiano yatachukua dakika 20 mpaka 30 tu kwa kukadiria.

Taarifa zote utakazotoa zitabaki kati yetu, na hili dodoso halitakuwa na kitu chochote cha kukutambulisha wewe mfano jina na tutatumia nambari maalum.

Baadhi ya maswali yanaweza kusababisha muamko wa hisia. Endapo hali kama hii itatokea unaruhusiwa kuomba muda wa kupumzika kidogo au kusimamisha mahojiano kabisa. Pia unahimizwa kuuliza maswali pale unapohitaji ufahamu zaidi.

Endapo uhitaji wa matibabu ya afya ya akili au ushauri nasaha kwako ukionekana, mpango wa kuendelea na utaratibu huo utafanyika baada ya mahojiano. Unakumbushwa kuwa hakutakuwa na faida ya moja kwa moja kwa kushiriki kwenye utafiti huu, ila matokeo yanaweza kutusaidia kuelewa jinsi wasiwasi ilivoenea katika jamii na pia kuleta maoni na mawazo ambayo yatasaidia utoaji wa huduma na aina za huduma zinazopatikana.

Baada ya kusoma maelezo haya, usisite kuuliza maswali yoyote kuhusiana na. utafiti huu na utajibiwa na mtu anayekuhoji. Ukiwa unahitaji ufahamu zaidi kuhusu utafiti huu, tumia namba ifuatayo kumfikia Mtafiti Mkuu: **Dr. Frank J. Kiwango: 0757 754 071**

Vile vile unaweza kumfikia endapo utakuwa na malalamiko yoyote kuhusu utafiti huu tafadhali tumia anuani ifuatayo: Mkurugenzi wa Kamati ya Utafiti na Machapisho S.L.P. 65001 Dar Es Salaam, Simu: +255 222151596

Nimesoma na nimeelewa taarifa za hapo juu. Nimeelewa kuwa ushiriki wangu ni wa hiari na taarifa hizi zitatumika katika utafiti huu tu. Maswali yote nilioulizia kuhusiana na utafiti huu yamejibiwa.

Sahihi ya mshiriki ……

Namba ya simu: ……. Tarehe: ……
(DD/MM/YYYY)

Appendix III: Questionnaire- English version

Please fill in the correct answers.

GENERAL INFORMATION

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

Name of interviewer: .....

Name of CTC……. CTC ID number ……..

DEMOGRAPHIC FACTORS QUESTIONNAIRE

1. **Age of interviewee in years ……..**

2. **Sex**
    1. Male
    2. Female

3. **Date since initiated on ART (>6 months)……..**
4. **What is your level of education?**
    1. Primary
    2. Secondary
    3. University, postgraduate/masters
    4. None or Informal

5. **What is your marital status?**
    1. Single
    2. Co-habiting
    3. Married
    4. Divorced or separated
    5. Widowed

6. **Do you have any employment/job?**
    1. Unemployed
    2. Employed
    3. Self employed
    4. Retired
7. **Do you use any substances such as alcohol, cigarettes, or cannabis?**
    1. Yes
    2. No

8. **What is the most recent viral load? (Check patients electronic medical records) …….**

Date of the viral load taken ……..

BRIEF COPE

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. Obviously, 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**	**2=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.				
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 acting 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				

		1= I usually don't do this at all	**2=I usually do this a little bit**	**2=I usually do this a medium amount**	**4= I usually do this a lot**
	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.				

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					

SHORT ANXIETY SENSITIVITY SCALE (SASSI)

ITEM	0 (very little)	1 (a little)	2 (some)	3 (much)	4 (very much)
1. When I tremble in the presence of others, I fear what people might think of me.					
2. When I feel pain in my chest, I worry that I'm going to have a heart attack.					
3. When I notice my heart skipping a beat, I worry that there is something seriously wrong with me.					
4. When my thoughts seem to speed up, I worry that I might be going crazy					
5. When my mind goes blank, I worry there is something terribly wrong with me.					

ANXIETY ASSESSMENT (GAD-7)

Now I am going to ask you about symptoms that you may have had in the past two weeks. Please tick in the box below the number that is closest to your situation in the past two weeks, with the following

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

Over the last two weeks, how often have you been bothered by the following problems?	Not at all (0)	Several days (1)	More than half the days (2)	Nearly every day (3)
1. Feeling nervous, anxious, or on edge				
2. Not being able to stop or control worrying				
3. Worrying too much about different things				
4. Trouble relaxing				
5. Being so restless that it is hard to sit still				
6. Becoming easily annoyed or irritable				
7. Feeling afraid, as if something awful might happen				

7b) Have you previously experienced any of the anxiety symptoms above for at least 2 weeks and nearly every day? 1. Yes 0. No…		
INSTRUCTIONS: IF YES PLEASE PROBE FOR HOW MANY YEARS AGO?		

PHQ-9 DEPRESSION SCREENER

No	Over the past two weeks how often have you experienced the following	(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?				

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				

Appendix IV: Questionnaire- Kiswahili Version

(DODOSO LA KISWAHILI)

MAELEZO YA AWALI

Tarehe ya mahojiano: (…./…../2023) Namba ya dodoso:……

Jina la msaili……..

Jina la kituo cha CTC…… Namba ya mshiriki ya CTC…….

MAELEZO BINAFSI

1. **Umri wako ni miaka mingapi?.....**

2. **Jinsia**
    1. Me
    2. Ke

3. **Tarehe kuanzia umeanza kutumia ARV (> miezi 6)……**
4. **Una kiwango gani cha elimu?**
    1. Elimu ya msingi
    2. Elimu ya sekondari
    3. Elimu ya Chuo/Chuo Kikuu
    4. Sijasoma au sijasomea shuleni

5. **Hali yako ya ndoa ipoje?**
    1. Sijaoa au sijaolewa
    2. Ninaishi na mpenzi ambaye sijamuoa/hajanioa
    3. Nimeoa au nimeolewa
    4. Tumetengana au kuachana
    5. Amefariki

6. **Taja aina ya ajira?**
    1. Nimeajiriwa
    2. Sijaajiriwa
    3. Nimejiajiri
    4. Nimestaafu

7. Unatumia vilevi vyovyote (pombe, sigara, mirungi au mengineyo)?

1. Ndio
2. Hapana

8. Idadi ya chembechembe za VVU katika kipimo cha mara ya mwisho? (Angalia katika taarifa za mgonjwa)……

Tarehe ya kipimo……

JINSI YA KUKUBALIANA HA 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 = Sijafanya hivi hata kidogo
2 = nimekuwa nikifanya hivi kidogo
3 = Nimekuwa nikifanya hivi kwa wastani
4 = nimekuwa 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 nayo	1 2 3 4
3	Nimekuwa ninajiambia hali ya kupata VVU "hii sio kweli."	1 2 3 4
4	Kunywa pombe au kutumia madawa ya kulevya ili kuondoa mfadhaiko	1 2 3 4
5	Unatafuta faraja kutoka kwa marafiki, mwenza wako, ndugu, watoa huduma wa afya, na wengineo.	1 2 3 4
6	Nimekuwa nikikata tamaa kujaribu kukabiliana na hali yangu	1 2 3 4
7	Nimekuwa nikichukua hatua mbalimbali kujaribu kufanya hali kuwa bora	1 2 3 4
8	Nimekuwa nikikataa kuamini kuwa nimepata maambukizi ya VVU	1 2 3 4
9	Nimekuwa nikisema mambo ili kuruhusu hisia zangu mbaya kuhusu VVU itoke	1 2 3 4
10	Nimekuwa nikipata msaada na ushauri kutoka kwa watu wengine	1 2 3 4
11	Nimekuwa nikitumia pombe au dawa nyinginezo ili kunisaidia kukabiliana na hali ya kuishi na VVU	1 2 3 4
12	Nimekuwa nikijaribu kuiona kwa mtazamo tofauti, ili kuifanya ionekane chanya zaidi.	1 2 3 4
13	Nimekuwa nina jilaumu kutokana na kupata maambukizi ya VVU	1 2 3 4
14	Kutafuta njia nzuri/mkakati wa nini cha kufanya ili kuishi vizuri na VVU	1 2 3 4
15	Nimekuwa nikipata faraja na uelewa kutoka kwa mtu juu ya VVU	1 2 3 4
16	Nimekuwa nikiacha kujaribu kustahimili juu ya hali yangu ya VVU	1 2 3 4
17	Nimekuwa nikitafuta kitu kizuri katika kile kinachotokea	1 2 3 4
18	Nimekuwa nikifanya utani juu ya hali yangu ya maambukizi	1 2 3 4
19	Nimekuwa nikifanya mambo, kama vile kwenda kwenye sinema, kutazama televisheni, kusoma, kulala, au kufanya manunuzi ili nisifikirie ugonjwa wa VVU	1 2 3 4
20	Nimetokea kukubali ukweli kwamba nimepata maambukizi ya VVU	1 2 3 4
21	Nimekuwa nikionyesha hisia zangu hasi juu ya VVU	1 2 3 4
22	Nimekuwa nikijaribu kupata faraja katika dini yangu au imani yangu ya kiroho juu ya maambukizi ya VVU	1 2 3 4
23	Nimekuwa nikijaribu kupata ushauri au usaidizi kutoka kwa watu wengine kuhusu nini cha kufanya kuhusu afya yangu	1 2 3 4
24	Nimekuwa nikijifunza kuishi na VVU kama magonjwa mengine	1 2 3 4
25	Nimekuwa nikifikiria sana ni hatua gani za kuchukua kuhusu maambukizi ya VVU	1 2 3 4
26	Huwa najilaumu kuhusu kupata maambukizi ya VVU	1 2 3 4
27	Huwa nasali kwaajili yakukubalina na hali yangu ya VVU	1 2 3 4
28	Unafanya utani au kudhihaki hali kupata VVU	1 2 3 4

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					

MAMBO YASABIBISHAYO MWOGEZEKO WA WASIWASI

KIPENGELE	0 (kidogo sana)	1 (kidogo)	2 (wastani)	3 (mara nyingi)	4 (mara nyingi sana)
1. Ninapotetemeka mbele ya wengine, ninaogopa watu watanifikiriaje					
2. Ninaposikia maumivu kwenye kifua changu, ninapata wasiwasi kwamba nitapata mshtuko wa moyo.					
3. Ninapoona moyo wangu unaruka mapigo, ninapata wasiwasi kwamba nina tatizo kubwa zaidi.					
4. Wakati mawazo yangu yanaenda kasi, ninapata wasiwasi kwamba ninaelekea kupata uwendawazimu.					
5. Wakati akili yangu inaposimama, huwa napata wasiwasi kwamba nina tatizo kubwa zaidi					

UDADISI KUHUSU DALILI ZA WASIWASI (GAD-7)

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=1, Siku kadhaa=2, Zaidi ya nusu ya siku zote=3, Karibu kila siku=4

Katika wiki mbili zilizopita, je umesumbuliwa na matatizo yapi katika yafuatayo?	Hakuna kabisa=1	Siku kadhaa=2	Zaidi ya nusu ya siku zote=3	Karibu kila siku=4
1. Kujisikia kuwa na hofu au wasiwasi				
2. Kushindwa kukaa bila kuwa na au kuudhibiti wasiwasi				
3. Kuwa na wasiwasi sana kwa vitu vingi (kadha wa kadha)				
4. Shida kutulia				
5. Shida ya kuweza kupumzika hadi kushindwa kukaa tuli				
6. Kuwa na hasira na kukasirika kwa kirahisi				
7. Kuwa na woga kwamba jambo baya linaweza kutokea				
7b). Je, kabla ya wiki mbili zilizopita, Umeshawahi kupata dalili za wasiwasi zilizotajwa hapo juu? 1. Ndio 0. Hapana				
MAELEKEZO: KAMA NDIYO, NI MIAKA MINGAPI ISHAPITA?				

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=1, Siku kadhaa=2, Zaidi ya nusu ya siku zote=3, Karibu kila siku=4

Katika wiki mbili zilizopita, ni mara ngapi umesumbuliwa na matatizo tajwa yafuatayo (weka vema kuonyesha jibu sahihi)		Hakuna kabisa=1	Siku kadhaa=2	Zaidi ya nusu ya siku zote=3	Karibu kila siku=4
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				
	JUMLA				
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				

UNYANYAPAA UTOKANAO NA VVU

Kipimo cha Unyanyapajiwa VVU kina sehemu ndogondogo zilizokusudiwa kupima unyanyapaaji wa kibinafsi, wasiwasi wa kufichua hali yako ya kiafya, wasiwasi na mitazamo ya umma na picha hasi ya ubinafsi.

Kwa kila kitu, toa jibu lako

Sikubaliani sana (SS) =0, Sikubaliani (S) =1, Nakubali (N)=2, au nakubali kabisa (NK)=3

			(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 hali ya kiafya	1b	Kumwambia mtu kuwa na VVU nihatari				
	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				

Appendix V: 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/1828 Date: 28/07/2023

MUHAS-REC-07-2023-1828
FRANK KIWANGO
SCHOOL OF MEDICINE
MUHAS

RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED: PREVALENCE OF SIGNIFICANT ANXIETY SYMPTOMS AND ASSOCIATED FACTORS AMONG ADULT PEOPLE LIVING WITH HIV/AIDS IN CARE AND TREATMENT CLINIC (CTCs) CENTERS IN MOSHI MUNICIPAL, KILIMANJARO REGION

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: 28/07/2023
EXPIRATION DATE OF APPROVAL: 28/07/2024

STUDY DESCRIPTION:
Purpose:
The purpose of this observational cross-sectional study is to determine the prevalence of significant anxiety symptoms and associated risk factors among adult PWHA attending selected CTC centers in Moshi Municipal, Kilimanjaro region.

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-%2014844.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://drd.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 VI: 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

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