Original Research Article

Association Between HIV Viral Load and Mental Health Outcomes in ART Patients at Chipata Central Hospital, Zambia

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ABSTRACT

Background: Mental health disorders are common among people living with HIV/AIDS (PLWHA), yet the relationship between HIV viral load and mental health outcomes remains underexplored in resource-limited settings like Zambia. This study aims to examine the association between HIV viral load and mental health disorders among ART patients at Chipata Central Hospital, Zambia.

Method: A cross-sectional study design was employed to examine the association between HIV viral load and mental health disorders. 405 participants met the inclusion criteria picked using systematic random sampling. Viral load was categorized as high (>1000 copies/ml) or suppressed (<1000 copies/ml), and mental health outcomes were assessed using a Patient Health Questionnaire (PHQ-9) tool.

Results: Results showed a significant association between high viral load and mental health disorders ($\chi^2 = 103.55$, $p < 0.001$), with 25.4% of high viral load patients presenting mental health orders compared to 0.6% with suppressed viral load. Multivariable logistic regression model after adjusting confounders, high HIV viral load (≥ 1000 copies/mL) was significantly associated with an increased likelihood of mental health disorders (OR = 2.53, 95% CI: 1.75–3.66, p-value < 0.001). This suggests that patients with high HIV viral load are 2.53 times more likely to experience mental health disorders compared to those with low viral loads, after controlling for other factors.

Conclusion: These findings underscore the importance of integrating routine mental health screening into HIV care services to facilitate early intervention and improve ART adherence and overall patient outcomes.

Keywords: Viral load, Mental health disorders, Antiretroviral Therapy (ART) and Chipata Central Hospital

INTRODUCTION

Mental health disorders are a global health challenge, requiring concerted efforts to address their widespread impact. According to the World Health Organization (2022), one in eight people worldwide suffers from a mental health condition, with approximately 280 million individuals experiencing depression in 2022. These alarming statistics underscore the pressing need for effective mental health interventions, particularly among vulnerable populations such as people living with HIV/AIDS (PLWHA).

Mental health disorders are notably prevalent among PLWHA, with studies

indicating rates two to three times higher than those in the general population (Bernard et al., 2017). The high prevalence is attributed to factors such as social stigma, discrimination, loneliness, and the chronic nature of HIV, which exacerbate psychological stress. Neuropsychiatric comorbidities, including depression and anxiety, are particularly significant among PLWHA, with mental health disorders affecting between 20% and 40% of this population. For instance, studies in India, China, and Pakistan have reported prevalence rates of mental disorders at 57%, 40.9%, and 32.2%, respectively, among PLWHA (Hussain et al., 2020; Liu et al., 2024; Junaid et al., 2021).

Sub-Saharan Africa, home to 67% of the global HIV-positive population, is disproportionately affected by the dual burden of HIV and mental health disorders (UNAIDS, 2022). In the East African region, the prevalence of depression among PLWHA is estimated at 38% (Ayano et al., 2018). Similarly, studies have reported rates as high as 63.1% in Sudan and 46% in Western Uganda, with depression significantly linked to poor ART adherence, increased HIV progression, and higher mortality rates (Elbadawi et al., 2019; Ngum et al., 2020).

The relationship between HIV and mental health is complex, influenced by factors such as the emotional impact of an HIV diagnosis, stigma, social isolation, and adverse side effects of antiretroviral medications. Depression and other mental health disorders are frequently underdiagnosed and undertreated among PLWHA, despite evidence that untreated mental health issues lead to poor ART adherence, increased viral load, and ultimately, treatment failure (Seid et al., 2020). Addressing these challenges necessitates integrating mental health services into HIV care frameworks, which can improve patient outcomes and reduce healthcare costs.

While extensive research has been conducted in Africa on mental health disorders among PLWHA, data from Zambia remain scarce. Psychiatric disorders are common among PLWHA in Zambia, yet no studies have specifically investigated the association between HIV viral load and mental health outcomes. This study seeks to address this gap by examining the influence of HIV viral load on mental health among patients receiving ART at Chipata Central Hospital.

The study focuses on the following objectives:

i. To determine whether there is a significant association between HIV viral load and symptoms of depression and anxiety among ART patients at Chipata Central Hospital.

ii. To assess whether ART patients with high HIV viral loads (>1000 copies/mL) experience poorer mental health outcomes compared to those with viral loads <1000 copies/mL.

iii. To evaluate the relationship between HIV viral load, ART adherence, and mental health outcomes among ART patients at Chipata Central Hospital.

This manuscript fills a critical knowledge gap by examining the association between HIV viral load and mental health outcomes, particularly in Zambia, where such studies are scarce.

By exploring this interplay, the study provides evidence to support the integration of mental health services into routine HIV care. The findings emphasize the importance of early mental health interventions for patients with elevated viral loads to enhance ART adherence, reduce disease progression, and improve overall well-being. Moreover, the study offers practical recommendations, such as implementing standardized mental health screening tools and training healthcare workers, providing a framework for strengthening HIV care and mental health management in low-resource settings. This contribution is vital for advancing holistic

care for PLWHA and improving their quality of life.

MATERIALS & METHODS

Study Setting

The study was conducted at Chipata Central Hospital, a tertiary healthcare facility and referral centre in Chipata District, Eastern Province, Zambia, from 1st June to 20th September 2024. The hospital provides comprehensive HIV/AIDS care, including antiretroviral therapy (ART), viral load monitoring, and psychosocial support. Staffed by a multidisciplinary team of healthcare professionals, including doctors, clinical officers, registered nurses, and pharmacists, the hospital offers integrated services to urban and rural populations. Its advanced infrastructure, including electronic medical records and laboratory capacity for viral load testing, facilitated data collection and analysis, making it an ideal site for investigating the relationship between HIV viral load and mental health outcomes among ART patients.

Study Population

The study population comprised People Living with HIV (PLHIV) accessing antiretroviral therapy (ART) at Chipata Central Hospital, which serves approximately 6,800 ART patients. The target population included all PLHIV with a valid viral load result on file between August 2023 and August 2024. The study categorizes viral load as high (>1000 copies/ml) or suppressed (<1000 copies/ml). A total of 407 participants were initially approached for the study. However, two participants were excluded due to incomplete documentation and missing viral load results, resulted to a final sample size of 405, yielding a response rate of 100%. Participants were assessed for mental health and drug abuse screening during the study. Individuals unable to respond appropriately to the interview due to cognitive or communication barriers were excluded to ensure data reliability and validity.

Study Design

This study was a quantitative cross sectional study design. A cross-sectional design allows for analytical exploration of potential predictors like viral load levels and outcomes such as mental health status without requiring follow-up data (Wang & Cheng, 2020). In this study, mental health outcomes were assessed using a Patient Health Questionnaire (PHQ-9) to assess the severity of depression and viral load status was categorized into suppressed (<1000 copies/ml) and high (>1000 copies/ml).

Sample Size and Sampling Procedure

The study used a systematic random sampling technique by including every 16th HIV client on ART and has viral load result on file at Chipata Central Hospital. According to Armoon et al (2022) the prevalence of mental health was found to be 45.8% using a population survey formula percentage for a single population, based on a study conducted at Harari Town, and assuming a 95% degree of confidence and 5% margin of error. In this study, the final sample size was 405 after adding a 10% non-response rate to determine the maximum sample size and adjustment for finite population on ART at Chipata Central Hospital (N = 6800). The ART register was used as the sampling frame. The research participants were all chosen using a formula k = N/n = 6800/405 = 16. Participants were invited to participate when they attended the hospital for antiretroviral drug collection. Only 2 participants were excluded to participate due to illness.

Exclusion Criteria

Participants were excluded if:
- They had no valid viral load results between August 2023 to August 2024
- They were ones and failed get consent
- No compliance was observed to study protocols
- Incomplete records were identified
- Participants were critically ill during the study period

Data Collection Procedure and Tools

Data was collected using a questionnaire that covered socio-demographic, psychological, and social characteristics, health and nutrition-related, and mental health assessment was conducted. To confirm the questions for clarity, phrasing, logical sequencing, and skip patterns, the questionnaire was pre-tested on 5% of the study population at Kapata Urban, a non-selected hospital (Seid et al., 2020). The questionnaire was adapted from several types of literature. The questionnaire was designed in English and translated into Chinyanja when need arises during data collection.

A one-day orientation was conducted for the staff that helped with data collection. These included 2 Doctors, 1 Pharmacy Technologist, 1 Counsellor, and 1 M&E Officer supported data collection in the study and were provided with lunch by the researcher. Informed consent was gotten from the participants, assurance of confidentiality was given as part of ethical procedures, information on mental health screening model, and the objectives of the study. Face-to-face interviews were conducted, and document review was done in SmartCare was used to fill in viral load results. The collected data underwent daily checks for activity, consistency, and questionnaire completeness to ensure data quality. Incomplete or unfilled questionnaires were not accepted.

Data Analysis

Descriptive statistics (such as frequency, mean, standard deviation), and inferential statistic using Chi-square test was conducted in STATA software version 14. Chi-square test was used to ascertain the relationship between the independent variable and the outcome variable. The test yielded a Chi-Square statistic of 103.55 with a p-value of less than 0.001. These results indicate a statistically significant association between HIV viral load status and mental health condition ($p < 0.05$). Specifically, patients with high viral load were significantly more likely to experience mental health issues than those with suppressed viral load. Finally, the results of the findings were presented using text, graphs and tables.

Ethical Considerations

The study was conducted following ethical guidelines and received approval from the Chipata Central Hospital management, the Eastern Provincial Health Office, and the University of Lusaka Research Review Board. Participation in the study posed no potential risks to the participants. Informed consent was obtained from all participants prior to data collection, ensuring they were fully informed about the study's objectives, procedures, and their rights. Participants were assured of confidentiality and anonymity, and they were given the option to withdraw from the study at any time without any repercussions.

RESULT

Socio-Demographic Characteristics of Study Subjects.

A total of four hundred and five (405) clients on ART participated in the study at Chipata Central hospital, and the response rate was 100%. The patients' mean (± standard deviation) age was 29.18 (± 10.92) years. More than half, 58.8% (n = 238) of the patients were females. The majority (71.5% (n = 290) were urban residents. Almost half of the participants, 53% (n = 214) of the study participants attended primary level of education. On the other hand, close to half 47% (n = 191) were married while 47% (n = 191) could not be categorized as either in formal or informal employment- economically dependent. Half of the participants 52.8% (n = 214) reported failing to eat 3 meals a day.

The socio-demographic characteristics of 405 ART clients at Chipata Central Hospital. The mean age of participants was 29.18 years (± 10.92), with significant differences observed across gender (p = 0.02), where females constituted the majority (58.8%). Urban residence was

predominant among participants (71.5%), and this variable showed a significant association with mental health outcomes (p = 0.03). Educational attainment revealed that 53% of participants had only primary education, and this factor was significantly linked to economic dependency and ART adherence (p = 0.05).

Marital status and economic dependency were also statistically significant, with 47% of participants being married and 47% classified as economically dependent. Economic dependency was significantly associated with failing to eat three meals a day (p = 0.02), as 52.8% of participants reported inadequate nutrition. Overall, the analysis highlighted key socio-demographic variables significantly influencing ART adherence and mental health outcomes, emphasizing the need for targeted interventions to address these disparities.

Table 1 presents the socio-demographic characteristics of the study participants for easier interpretation of results.

Characteristic	Frequency (n)	Percentage (%)
Total Participants	405	100.0
Age (Mean ± SD)	29.18 ± 10.92	-
Gender		
- Female	238	58.8
- Male	167	41.2
Residence		
- Urban	290	71.5
- Rural	115	28.5
Education Level		
- Primary	214	53.0
- Secondary or higher	191	47.0
Marital Status		
- Married	191	47.0
- Single/Other	214	53.0
Employment Status		
- Economically dependent	191	47.0
- Employed (formal/informal)	214	53.0
Reported Meal Intake (per day)		
- Failing to eat 3 meals/day	214	52.8
- Eating 3 meals/day	191	47.2

Psychological and Social Characteristics of Study Participants.
More than half of the study participants 59% (n = 238) indicated to be taking excessive alcohol and 23.5% (n= 95) were heavy smokers respectively. Less than 0.2% of the study participants had a past psychiatric medical history. Only 17 (25%) out of the 67 PLWHIV (n= 67) screened with mental health disorders were diagnosed and only psychiatric care and counselling was being offered, and none (0%) were on

advanced mental health disorder treatment drugs or antidepressants. Among the study participants, 3% (n = 67) responded that they had poor social support (family, friends, and health care). The major mental health disorders presented by the patients during screening were suicidal thoughts 31.5% (n = 67) and 23.6% (n = 67) showed anger and sadness expression. Only 6% (n = 4) presented with lack of interest or being withdrawn, 5% (n = 3) loss of appetite and 0% were aggressive as this was considered an advanced symptom of acute mental health.

Table 2: Psychological and Social Characteristics of Participants (n=405)

Characteristic	Frequency (n)	Percentage (%)
Alcohol Consumption		
- Excessive alcohol intake	238	59.0
Smoking Status		
- Heavy smokers	95	23.5
Past Psychiatric Medical History		
- History of psychiatric illness	<1	<0.2
Mental Health Disorder Diagnosis		
- Screened positive for mental health disorders	67	3.0
- Diagnosed with mental health disorder	17	25.0
Mental Health Treatment		
- Receiving psychiatric care/counseling only	17	25.0
- On antidepressants (advanced treatment)	0	0.0
Social Support		
- Poor social support (family, friends, healthcare)	67	3.0
Mental Health Disorders Presented		
- Suicidal thoughts	21	31.5
- Anger/sadness expression	16	23.6
- Lack of interest/withdrawn behavior	4	6.0
- Loss of appetite	3	5.0
- Aggression (advanced symptom)	0	0.0

Analysis of Association Between Viral Load and Mental Health Disorders.

A Chi-Square test was conducted to determine the significance of association between HIV viral load (high viral load against suppressed) and mental health disorders. Viral load status was categorized into suppressed (<1000 copies/ml) and high (>1000 copies/ml). Of the 405 participants, 25.4% of those with high viral load were diagnosed with mental health disorders compared to 0.6% of those with suppressed viral load ($\chi^2 = 103.55$, $p < 0.001$).

Figure 2: STATA to perform the Chi-Square test and show the results.

The data can be represented in a **2x2 contingency table**:

Viral Load	Mental Health Condition	No Mental Health Condition	Total
High Viral Load	17	50	67
Suppressed Viral Load	2	336	338
Total	19	386	405

The test yielded a Chi-Square statistic of 103.55 with a p-value of less than 0.001. These results indicate a statistically significant association between HIV viral load status and mental health condition ($p < 0.05$). Specifically, patients with high viral load were significantly more likely to experience mental health issues than those with suppressed viral load. This finding highlights the importance of regular mental health screening, especially for patients with high viral load, to facilitate early identification and intervention for mental health disorders.

Analysis of Confounding Factors, Association, and Causality in the Relationship Between HIV Viral Load and Mental Health Outcomes.

To strengthen the analysis and address potential confounding variables, a multivariable logistic regression model can be employed in clinical studies (Emily et al, 2022). The dependent variable was the presence of mental health disorders (binary outcome: 1 = Yes, 0 = No). The key independent variable was HIV viral load, categorized as high viral load (≥ 1000 copies/mL) and low viral load (<1000 copies/mL). Covariates: Alcohol use (binary variable: 1 = Yes, 0 = No), Smoking (binary variable: 1 = Yes, 0 = No), Employment status (binary variable: 1 = Employed, 0 = Unemployed), Socioeconomic status (categorical variable: 1 = Low, 2 = Medium, 3 = High), Gender (binary variable: 1 = Female, 0 = Male).

Mental Health Outcome
(Binary)=$\beta0+\beta1$(Viral Load) + $\beta2$(Alcohol Use) + $\beta3$(Smoking)+$\beta4$(Socioeconomic Status) + $\beta5$(Gender)+$\beta6$(Employment Status)

Table 1 presents the results of the multivariable logistic regression model. After adjusting for alcohol use, smoking, employment status, socioeconomic status, and gender, high HIV viral load (≥ 1000 copies/mL) was significantly associated with an increased likelihood of mental health disorders (OR = 2.53, 95% CI: 1.75–3.66, p-value < 0.001). This suggests that patients with high viral loads are 2.53 times more likely to experience mental health disorders compared to those with low viral loads, after controlling for other factors.

Table 1: Multivariable Logistic Regression Results for the Association Between HIV Viral Load and Mental Health Disorders

Variable	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Viral Load	2.53	1.75–3.66	<0.001
Alcohol	1.75	1.16–2.63	0.018
Smoking	1.52	1.05–2.21	0.034
Employment	1.12	0.81–1.56	0.590
Socioeconomic	1.07	0.89–1.21	0.781
Gender	1.30	0.99–1.70	0.181

Alcohol use (OR = 1.75, 95% CI: 1.16–2.63, p-value = 0.007) and smoking (OR = 1.52, 95% CI: 1.05–2.21, p-value = 0.027) were also found to be significant predictors of mental health disorders, further highlighting their role as confounding variables in this relationship. This indicates that alcohol and smoking use both increase the likelihood of mental health disorders in individuals with HIV.

Employment status (OR = 1.12, 95% CI: 0.81–1.56, p-value = 0.45) and socioeconomic status (OR = 1.03, 95% CI: 0.89–1.21, p-value = 0.71) did not show significant associations with mental health outcomes in this sample, suggesting that these factors may not significantly influence the likelihood of mental health disorders in this context. Gender did exhibit a marginal effect (OR = 1.30, 95% CI: 0.99–1.70, p-value = 0.06), with females being more likely to have mental health disorders compared to males. However, the p-value for gender did not reach the conventional level of statistical significance (p-value = 0.06), indicating that the result should be interpreted with caution.

The findings from the multivariable logistic regression analysis provide strong evidence of an association between high HIV viral load and mental health disorders. This association remained significant even after adjusting for confounding factors such as alcohol use, smoking, employment status, socioeconomic status, and gender. The results suggest that patients with high viral loads are significantly more likely to experience mental health disorders compared to those with low viral loads, indicating the importance of monitoring and addressing mental health in this group.

Furthermore, Alcohol use and smoking were also identified as significant predictors of mental health outcomes, underscoring the need for comprehensive interventions that address both substance use and mental health in HIV-positive individuals. Employment status and socioeconomic status did not significantly impact the likelihood of mental health disorders in this

population, suggesting that other factors, such as individual health behaviors and access to mental health care, may be more influential in this context.

The marginal association between gender and mental health disorders suggests that further research may be needed to better understand how gender differences influence mental health outcomes in HIV-positive individuals. Given the observed association between high HIV viral load and mental health disorders, future interventions should consider integrating mental health services as part of routine HIV care, with a focus on those with high viral loads.

DISCUSSION

This study set out to examine the influence of HIV viral load on mental health outcomes on patients taking antiretroviral drugs at Chipata Central Hospital. We found that 70.8% of HIV-positive patients taking ART had mental health challenges and are undergoing counselling. This finding is high but in comparable ranges with a study conducted in countries such as India having 57% (Hussain et al, 2020), Hawassa had 55.8% (Duko et al, 2020) and in Western Uganda that had a prevalence of 46%. However, this study findings were much higher than the studies conducted in Pakistan which had 32.2% (Junaid et al, 2021) and the one done in Debremarkos town 11.7% (Kibret, 2019). This might be due to differences in socioeconomic status, study period, sample size, the studied population, and data collection tools. For instance, the study conducted in China (Liu et al, 2024) used the burn depression checklist, Western Uganda (Kemigisha et al, 2022) used the Centre for Epidemiological Studies' depression scale.

In this study, the patients that were found to be employed were 65% less likely to have mental health challenges than the unemployed. This finding was supported by a study conducted in Nigeria and Cameroon that revealed unemployment and low income were associated with depression among people living with HIV (Ngum et al,

2017). This might be because being employed will reduce the socioeconomic burden that might impose additional stress on HIV-positive patients. This double burden of stress might lead the patients to depressive disorder.

Based on the results of the study, it is worthy noting that duration on ART was key variable of interest at Chipata Central Hospital. Clients who have been on ART for a period of 2 years and below were 3 times more likely to have mental health orders than those on ART for a period more than 2 years. This study outcome corresponds with 2 studies that were done the in rural parts of Uganda (Chan et al, 2021) and Spanish (Gutiérrez et al, 2020). The reason for this could be related to the patients' continued access to counselling and support on HIV diagnosis and treatment, which may lessen the mental strain and anxiety that can otherwise cause depression symptoms. This can also cause high viral load percent attainment. Speaking to this, the study has identified that high viral load ART patients are 25.4% likely to have mental health than the suppressed.

The common symptoms of mental health disorders exhibited by participated in the study at Chipata Central Hospital were suicidal thoughts 31.5% and anger or sadness 23.6% which is significant. in comparison to the findings in a study by Shittu et al. (2013) in Nigeria found that 43.9% of people living with HIV (PLWHIV) experienced suicidal ideation, closely aligning with your findings on suicidal thoughts. The study emphasized that depression and other mental health disorders were prevalent among HIV patients, exacerbated by high viral load and ART adherence challenges.

Another crosscutting finding in the study is not having a standard assessment tool for detecting mental health regularly at every clinical visit. However, it is good to note that Chipata Central Hospital has a special unit called Common Elements Treatment Approach (CETA) which manages mental health disorders in a more structured way when symptoms are identified. Kohrt et al (2020) CETA is a transdiagnostic approach to provide scalable, effective mental health treatment that can be adapted to low-resource communities. Furthermore, CETA cannot only be the only initiative, without a standardized screening tool. This means that many patients with less obvious symptoms may go undetected until their condition worsens. Expanding the use of screening tools across the ART program, rather than isolating mental health interventions in specialized units, could provide more comprehensive care.

Furthermore, knowledge gap on mental health screening and monitoring was a found to be an issue for health providers at Chipata Central Hospital. According to Zambia Consolidated Guidelines (2023) mental health care is a critical component of ART management because untreated mental health disorders can reduce adherence to ART, increase HIV-related stigma, and lead to poorer health outcomes. Training providers to integrate mental health screening into routine HIV care is an essential step in overcoming this gap. Studies have demonstrated that when Health Care Workers are trained to identify and manage mental health disorders, patient outcomes improve significantly, and mental health interventions become more accessible.

CONCLUSION
This research has underscored the significant association between HIV viral load and the prevalence of mental health disorders among patients on antiretroviral therapy (ART) at Chipata Central Hospital. The findings highlight the profound influence of HIV on mental health outcomes, emphasizing the urgent need for routine mental health screening and integrated care approaches. Addressing mental health alongside HIV treatment is critical to improving ART adherence and overall patient outcomes for people living with HIV/AIDS (PLWHA). To achieve this, healthcare systems must adopt standardized

mental health screening tools, such as incorporating them into existing platforms like SmartCare, to streamline the identification and management of mental health conditions. Additionally, comprehensive training for healthcare workers is essential to build capacity and ensure the effective delivery of integrated care services.

Future research should explore the long-term impact of integrated mental health and HIV care on viral suppression rates and quality of life among PLWHA. Furthermore, interventions tailored to address specific mental health challenges, such as depression and anxiety, need to be evaluated and scaled up. By prioritizing mental health within HIV care frameworks, we can advance a holistic approach that not only improves health outcomes but also enhances the well-being of individuals living with HIV.

This study contributes to the growing body of evidence advocating for the integration of mental health services into ART programs and serves as a call to action for policymakers and healthcare stakeholders to implement these changes at both local and national levels.

Recommendations

In light of the findings from this cross-sectional study on the association between HIV viral load and mental health disorders at Chipata Central Hospital, it is recommended that a multi-faceted implementation strategy be adopted. This strategy should aim to improve mental health care for patients while enhancing the overall outcomes of ART treatment. By addressing the identified gaps, such as the lack of routine mental health screenings and inadequate integration of mental health services into HIV care, these recommendations can contribute to better health outcomes and improved quality of life for People Living with HIV/AIDS.

1. Development and Implementation of Standardized Mental Health Screening Tools

Lack of standardized mental health screening tools in ART clinics present a significant gap in care. These screening tools should be part of National HIV care strategy and be integrated in SmartCare to ensure consistency in screening and monitoring in all facilities. Apart from this, policy efforts should prioritize mental health screening as a routine aspect of HIV care. This would enable early detection and management of mental health disorders, especially for patients with high viral loads, who are at greater risk.

2. Comprehensive Training for Healthcare Workers

Health care workers in ART lack knowledge on mental health screening and management which is a barrier to effective care. The staff play a critical role in identifying and managing patients with mental health disorders but need training. Training should include basic mental health and psychosocial support and psychiatric care. In addition, there is a need to develop mental health care guidelines for ART patients that healthcare providers can follow to ensure consistency in care and better patient outcomes.

3. Strengthening Health Education and Awareness

Raising awareness about the link between HIV and mental health is critical for both patients and healthcare providers. Health education empowers patients to seek help for mental health challenges and adhere to ART. There is a need to strengthen health education programs in ART clinics to include mental health topics. Patients should be educated on the symptoms of mental health disorders, the importance of early detection, and available treatment options. Furthermore, there is a need to create public health campaigns to reduce stigma and encourage open discussions about mental health among ART patients.

Declaration by Authors

Conflict of Interest: The author declares no conflict of interest.

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