

Psychological Impairment, Coping Strategies, and Associated Factors among Adults Living with HIV Receiving Antiretroviral Therapy in Western Area Urban, Sierra Leone: An Analytical Cross-sectional Study

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Abstract

Introduction:

Psychological impairment is a common but often overlooked challenge among people living with HIV/AIDS (PLWHA), negatively affecting treatment adherence, retention in care, and quality of life. Despite increasing access to antiretroviral therapy (ART), evidence on the psychological well-being and coping strategies of PLWHA in Sierra Leone remains limited. This study assessed the prevalence of anxiety and depression, identified associated sociodemographic factors, and evaluated coping strategies among PLWHA in the Western Area Urban District.

Methods

An analytical facility-based cross-sectional study was conducted between August and October 2024 among 422 adults receiving antiretroviral therapy (ART) at Connaught, Rokupa Government, and Lumley Government Hospitals in Western Area Urban, Sierra Leone. Participants were recruited using consecutive sampling. Data were collected using interviewer-administered questionnaires incorporating the Hospital Anxiety and Depression Scale (HADS) and the Brief-COPE Inventory. Descriptive statistics were used to summarize participant characteristics, psychological impairment, and coping strategies. Binary logistic regression analyses were performed to identify factors independently associated with anxiety and depression. Variables with p-values < 0.05 in the bivariate analysis and those considered epidemiologically important were entered into multivariable logistic regression models. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were reported, and statistical significance was considered at $p < 0.05$.

Results

Overall, 49.8% of participants experienced mild anxiety, and 21.8% had symptomatic anxiety, while 50.5% had mild depression and 39.6% had symptomatic depression. Female participants had significantly higher odds of anxiety (AOR = 2.08, 95% CI:1.21–3.59) and depression (AOR = 3.72, 95% CI:1.53–9.05). Participants aged 30–49 years were less likely to experience depression (AOR = 0.16, 95% CI:0.05–0.50). Humour, planning, religious coping, acceptance, and informational support were the most frequently adopted adaptive coping strategies, whereas denial, substance use, and behavioural disengagement remained common maladaptive responses.

Conclusion

Psychological impairment is highly prevalent among PLWHA in Western Area Urban, Sierra Leone. Integrating routine mental health screening, psychosocial counselling, stigma reduction initiatives, and

interventions that promote adaptive coping into HIV care is essential to improve mental wellbeing, treatment adherence, and overall health outcomes.

Background

Human Immunodeficiency Virus (HIV) remains one of the leading public health challenges in the world despite remarkable advances in antiretroviral therapy (ART) that have transformed HIV infection from a fatal disease into a manageable chronic condition (1). According to the World Health Organization (WHO), an estimated 40.8 million people were living with HIV globally at the end of 2024, with approximately 1.3 million new infections and 630,000 HIV-related deaths occurring during the same year (2). Although increased access to ART has substantially improved life expectancy and reduced HIV-related mortality, people living with HIV/AIDS (PLWHA) continue to experience significant psychological and social challenges that negatively affect their quality of life, treatment adherence, and overall health outcomes (3).

The burden of HIV extends beyond its physiological manifestations to include profound psychological consequences. Receiving an HIV diagnosis often triggers emotional distress characterized by fear, anxiety, depression, hopelessness, uncertainty about the future, and concerns regarding disclosure and stigma (4). These psychological impairments are frequently exacerbated by social discrimination, financial hardship, fear of disease progression, relationship instability, and concerns about employment and social acceptance. Consequently, mental health disorders among PLWHA occur at substantially higher rates than in the general population and are increasingly recognized as important determinants of HIV treatment success and long-term well-being (5). Recent evidence indicates that psychological distress among PLWHA is multidimensional, encompassing emotional, social, identity-related, and illness-related distress that significantly influences engagement in HIV care (6).

Depression and anxiety are among the most common psychological disorders affecting people living with HIV/AIDS. Studies have consistently demonstrated that untreated psychological impairment contributes to poor adherence to ART, reduced viral suppression, increased risk-taking behaviours, poor retention in care, diminished quality of life, and increased mortality (7). Furthermore, HIV-related stigma remains a persistent psychosocial stressor that intensifies feelings of isolation, shame, and self-stigma, thereby worsening mental health outcomes. Individuals experiencing high levels of stigma are often reluctant to disclose their HIV status or seek psychosocial support, limiting opportunities for early mental health intervention and comprehensive HIV care (8).

Despite these challenges, many people living with HIV successfully adapt to their diagnosis through various coping strategies. Coping strategies refer to the cognitive and behavioural efforts individuals employ to manage stressful situations and reduce emotional distress (9). These strategies may be adaptive, including seeking social support, religious or spiritual engagement, acceptance, positive reframing, problem-solving, participation in support groups, and adherence to treatment, or maladaptive, such as substance abuse, denial, social withdrawal, and avoidance behaviours (10). Evidence suggests

that adaptive coping mechanisms enhance resilience, improve mental wellbeing, strengthen treatment adherence, and promote better health-related quality of life among PLWHA. A recent systematic review identified resilience resources such as self-efficacy, optimism, spirituality, social support, mindfulness, and access to healthcare as important protective factors against psychological distress among people living with HIV (11).

In sub-Saharan Africa, where approximately two-thirds of the global HIV burden is concentrated, psychological impairment among PLWHA remains an under-recognized public health concern. While considerable efforts have focused on expanding HIV diagnosis and treatment services, integration of mental health services into HIV care remains limited in many low- and middle-income countries (12). Socioeconomic challenges, persistent HIV-related stigma, inadequate mental health resources, and shortages of trained mental health professionals further compound the psychological burden experienced by PLWHA in the region. These contextual factors underscore the need for locally relevant evidence to inform integrated HIV and mental health interventions (13).

Sierra Leone has made significant progress in strengthening HIV prevention, diagnosis, and treatment services; however, HIV continues to pose substantial health and social challenges. The Western Area Urban District, which includes the capital city of Freetown, has one of the highest concentrations of people living with HIV in the country because of its dense population, urban migration, and concentration of health facilities. Alongside clinical management, PLWHA in this setting often encounter stigma, discrimination, unemployment, poverty, family disruption, and limited psychosocial support, all of which may contribute to psychological impairment (14). Nevertheless, research in Sierra Leone has predominantly focused on HIV epidemiology, treatment outcomes, and prevention, with relatively limited attention devoted to the mental health experiences and coping mechanisms of PLWHA (15).

Understanding the psychological impairment experienced by people living with HIV/AIDS and the coping strategies they adopt is essential for designing comprehensive HIV care programmes that address both physical and mental health needs. Such evidence can inform policymakers, healthcare providers, mental health practitioners, and non-governmental organizations in developing interventions that promote resilience, improve psychological wellbeing, strengthen adherence to ART, and ultimately enhance the quality of life of PLWHA. Furthermore, findings from this study will contribute to the growing body of literature on HIV-related mental health in low-resource settings and support the integration of mental health services into routine HIV care in Sierra Leone.

Therefore, this study seeks to assess the psychological impairment and coping strategies among people living with HIV/AIDS in the Western Area Urban District of Sierra Leone. By examining the psychological challenges faced by PLWHA and identifying the coping mechanisms they use, the study aims to generate evidence to guide the development of patient-centred psychosocial interventions and to strengthen comprehensive HIV care services.

Methods

1.2. Study Design: This study employed an **analytical facility-based cross-sectional design** to assess the prevalence of psychological impairment, coping strategies, and associated factors among adults living with HIV receiving antiretroviral therapy in three major HIV treatment facilities in Western Area Urban, Sierra Leone. A cross-sectional analytical design was considered appropriate because it enabled simultaneous assessment of psychological outcomes and their associated sociodemographic and clinical factors within a defined population. The study was conducted from August to October 2024 and is reported in accordance with the **Strengthening the Reporting of Observational Studies in Epidemiology (STROBE)** guidelines.

1.3. Study Setting: This study was conducted at the Connaught, Rokupa, and Lumley Government Hospitals, all of which are situated in Western Urban, Sierra Leone. They constitute the largest HIV clinics and treatment centres in the country. These facilities offer both outpatient and inpatient services, including HIV counselling and testing services (HCTS), Prevention of mother-to-child transmission (PMTCT) services, antiretroviral treatment (ART), and treatment of opportunistic infections.

1.4. Study Population: This study incorporated 422 participants among the three targeted hospitals in Freetown, with an uneven distribution of HIV/AIDS patients: 191 participants for Connaught Hospital, 98 participants for Rokupa Government Hospital, and 95 participants for Lumley Government Hospital. Consecutive sampling was applied to obtain sampling units at the study site.

1.5. Sample Size Determination

The minimum sample size was estimated using the Cochran formula for a single population proportion:

Required Sample (n)= $\frac{Z^2 Pq}{d^2}$ by Cochran formula

Where:

§ n= minimum sample size

§ z= value of the test statistic (for 95% confidence level, z= 1.96)

§ p = 0.5 (assumption that the probability of psychological impairment, coping strategies, and associated factors among adults living with HIV receiving antiretroviral therapy in Western Area Urban, Sierra Leone)

§ q = 1-p, which is (1-0.05) = 0.5

§ d = absolute error or precision is 0.05

§ Therefore: n= $\frac{1.92^2 \times 0.5 \times 0.5}{0.05^2}$

§ n= 384

The additional 10%, which sum up to 38 participants, were distributed among the three hospitals.

The actual sample size= $384 + 38 = 422$

1.6. Operational Definitions

Psychological impairment

Psychological impairment refers to the presence of clinically significant symptoms of anxiety and/or depression as measured using the Hospital Anxiety and Depression Scale (HADS). Participants with HADS scores ≥ 8 were perceived to have psychological impairment.

Adaptive coping

Adaptive coping refers to constructive behavioural and cognitive responses that facilitate effective management of HIV-related stressors, including planning, acceptance, positive reframing, humour, religion, and seeking informational or emotional support.

Maladaptive coping

Maladaptive coping refers to ineffective behavioural or emotional responses that increase psychological distress, including denial, behavioural disengagement, self-blame, self-distraction, and substance use.

People Living with HIV (PLHIV)

Individuals aged 18 years or older with confirmed HIV infection receiving antiretroviral therapy at one of the participating health facilities.

1.7. Sampling Procedure

Consecutive sampling was adopted because it ensured recruitment of all eligible participants attending the HIV clinics during the study period. Although consecutive sampling may introduce selection bias by excluding individuals who do not attend clinic appointments, recruitment across multiple high-volume ART clinics over several months helped improve representativeness.

1.8. Eligibility Criteria

All HIV/AIDS patients (age >18 years old) visiting HIV clinics at Connaught, Rokupa and Lumley hospitals in the Western Area during the study period. Also, Patients diagnosed with HIV/AIDS and attending HIV clinics for the past two years. The study excludes HIV/AIDS patients with severe mental disorder (e.g., unresponsive participants) and paediatric HIV/AIDS patients.

1.9. Ethical Approval

Ethical approval for this study was obtained from the **Sierra Leone Ethics and Scientific Review Committee** Approval No.: 05/04/2023. Administrative approval was further obtained from Connaught Hospital, Rokupa Government Hospital, and Lumley Government Hospital before commencement of data collection.

Written informed consent was obtained from all participants before enrolment. Participants were informed about the objectives of the study, voluntary participation, confidentiality, anonymity, and their right to withdraw at any stage without affecting their clinical care. Personal identifiers were excluded from the dataset to maintain participant confidentiality. The study complied with the ethical principles outlined in the Declaration of Helsinki.

1.10. Data collection instrument

The required data for this research were collected using a set of pre-validated self-administered questionnaires. The questionnaire was written in English and designed after a detailed review of relevant literature. Specifically, a template of questions from similar studies was adopted (16).

Patients were interviewed (face-to-face interview) using an adapted structured questionnaire which consists of four sections. This include socio-demographics (age, gender, residence, ethnicity, religion, marital status, educational level, occupation and income), Hospital Anxiety Depression Scale (HADS) consisting of two sections the Anxiety section consisting of 7 questions and depression section consisting of 7 questions, where respondents rate themselves on a four-point scale for anxiety (e.g. 0= not at all, 1= from time to time, occasionally, 2= a lot of the time, 3= most of the time) and also four-point scale for depression (0= definitely as much, 1= not quite so much, 2= only a little, 3= hardly at all) Total scores was obtained by summing all scale items. Finally, respondents were categorized as follows: 0-7= no clinical symptoms, 8-10= mild, and 11-21= symptomatic anxiety or depression according to the HADS scale (17).

The Brief-COPE questionnaire was used to evaluate the coping strategies adopted by the study participants. It is a validated 28-item self-report questionnaire that measures effective and ineffective ways to cope with a stressful life event (18). Responses to each item are scored from 1 (I have not been doing this at all) to 4 (I have been doing this a lot). The Brief-Cope explores the following 14 coping methods: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humour, acceptance, religion, and self-blame. Possible scores ranged from 2 to 8 for each coping style; higher scores indicated a higher tendency to implement the corresponding coping style.

Internal consistency of the study instruments was evaluated using Cronbach's alpha coefficients calculated from the present study sample. The Hospital Anxiety Scale demonstrated **acceptable internal consistency (Cronbach's α = 0.661)**, while the Hospital Depression Scale demonstrated **good internal consistency (Cronbach's α = 0.712)**. The Brief-COPE inventory also demonstrated acceptable reliability (Cronbach's α = 0.725), indicating satisfactory consistency of the study instruments.

1.11. Procedure

Patients were visited in their various HIV/AIDS clinics at the three selected facilities, where they were briefed about the objectives of the research. Each target hospital was visited on separate days. The informed consent of those who were willing to participate in the study was sought (both verbal and written), and the questionnaire was administered by the principal investigator and other data collection assistants. To ensure confidentiality and anonymity, personal details such as patient name and address were omitted from the questionnaires. 422 patients gave their consent to participate in the study. Some of the completed questionnaires were collected the same day they were distributed, and others were collected on different dates through the help of nurses working in the HIV/AIDS clinics.

1.12. Data Quality Assurance

To ensure data quality, the questionnaire was pretested among approximately 5% of the estimated sample size at a health facility not included in the main study. Necessary revisions were made following the pre-test to improve clarity, consistency, and completeness of the questionnaire. Data collectors received intensive training on study objectives, ethical conduct, interview techniques, and questionnaire administration. Daily supervision was conducted throughout data collection, and completed questionnaires were checked for completeness and consistency before data entry. Double data entry and validation were performed to minimize transcription errors.

1.13. Data sorting and editing

Following the collection of the completed questionnaires, immediate editing was done to check for and eliminate errors and mistakes, making sure no questions were left unanswered to prevent missing data. The questionnaires were compiled as per target HIV/AIDS clinics, and the responses or variables were coded accordingly.

1.14. Analysis of data

Completed questionnaires were reviewed before data entry, and no variable contained more than 5% missing observations. Missing data were assessed and determined to be completely at random; therefore, complete-case analysis was undertaken.

Data were entered into IBM SPSS Statistics version 21 for analysis. Continuous variables were summarized using means and standard deviations (SD), whereas categorical variables were presented as frequencies and percentages.

Anxiety and depression scores obtained using the Hospital Anxiety and Depression Scale (HADS) were dichotomized into **absence of clinically significant symptoms (score 0–7)** and **presence of psychological impairment (score ≥ 8)** for binary logistic regression analysis.

Initially, bivariate logistic regression analyses were performed to identify variables associated with anxiety and depression. Variables with p-values <0.05 together with variables considered epidemiologically important based on previous literature were included in the multivariable logistic regression models. Adjusted odds ratios (AORs) with corresponding 95% confidence intervals (95% CI) were reported. Statistical significance was established at $p < 0.05$.

Results

1.15. Sociodemographic characteristics of the study participants

A total of 422 participants were recruited in this study. Upon analysis, it was revealed that the majority, 250 (59.2%), of the respondents were females. About 108 (25.6%) of the respondents were living in the East End of Freetown, 105 (24.9%) were living in the West End of Freetown, and 209(49.5%) were living in the Central part of Freetown. (59.5%) of respondents are Muslims and 40.5% of respondents are Christians. In this study, 42.7% of respondents are married, 51.4% are single, 4% have divorced from previous marriages, and 1.9% are widows.

Regarding educational levels, primary, secondary, undergraduate, and postgraduate were seen in 14.5%, 47.9%, 31.5%, and 6.2% cases, respectively.

The distribution of study participants among the three hospitals revealed that 209(49%) were participants from Connaught Hospital, 108(26%) were participants from Rokupa Hospital, and 105(25%) were participants from Lumley Hospital, respectively. Additional details of the occupational status of the study participants are illustrated in **Table 1**.

Table 1. Sociodemographic Characteristics of Study Participants (N=422), October 2024

Variable	Sub-variable	Frequency	Percent
Age (years)	18-29	180	42.7
	30-49	146	34.6
	>50	96	22.7
Gender	Male	172	40.8
	Female	250	59.2
Residence (Western Area Urban)	East End	108	25.6
	West End	105	24.9
	Central	209	49.5
Religion	Islam	251	59.5
	Christianity	171	40.5
Marital Status	Single	241	57.1
	Married	181	42.9
Educational Level	Primary	61	14.5
	Secondary	202	47.9
	Undergraduate	133	31.5
	Postgraduate	26	6.20
Occupation	Student	76	18.0
	Self-employed	124	29.4
	Employed	86	20.4
	Unemployed	136	32.2
Income of Patient (in Leones)	<800	295	69.9
	801-3,000	92	21.8
	>3,000	35	8.3

1.16. Prevalence of Anxiety and Depression of People Living with HIV/AIDS

The prevalence of psychological impairment among study participants was considerable. Overall, 302 (71.6%) of participants experienced either mild or symptomatic anxiety, while 380 (90.1%) experienced either mild or symptomatic depression. Approximately one in every five participants demonstrated symptomatic anxiety, whereas nearly two in every five experienced symptomatic depression, indicating a substantial burden of untreated psychological morbidity among adults receiving ART. **Table 2.**

Table 2. Prevalence of Anxiety and Depression of People Living with HIV/AIDS (N=422), October, 2024

Variable	Sub-variables	Frequency	Percent
Anxiety	No clinical symptoms	119	28.2
	Mild	210	49.8
	Symptomatic	92	21.8
Depression	No clinical symptoms	42	10.0
	Mild	213	50.5
	Symptomatic	167	39.6
		Mean	Std. Deviation
Anxiety	Anxiety score	2.30	0.639
Depression	Depression score	1.93	0.711

1.17. Brief-Coping Strategies of People Living with HIV/AIDS

The overall Brief-COPE score of the respondent was 2.549 ± 0.365 . Regarding avoidant brief coping strategies, participants employed high use of substance 2.41 ± 0.948 and denial 2.41 ± 0.948 , followed by behavioural disengagement and low strategies of self-distraction 2.10 ± 0.787 . Furthermore, problem-focused coping strategies findings revealed that HIV patients employed high planning strategies, 2.78 ± 0.750 , moderate use of informational support, and positive reframing coping styles were adopted by HIV/AIDS patients.

In this study, emotionally-focused coping styles of respondents showed a higher mean score for humour coping strategies, 2.98 ± 0.812 , followed by religious coping styles, 2.78 ± 0.750 . Emotional support and venting were the lowest for emotion-focused brief coping strategies, therefore increasing their ability to adapt. As shown in **Table 3**.

Table 3. Brief coping strategies of People Living with HIV/AIDS (N=422), October 2024

Variable	Sub-variable	Minimum	Maximum	Mean	Std. Deviation
Avoidant	Self-distraction	1	4	2.10	0.787
	Denial	1	4	2.41	0.948
	Substance use	1	4	2.41	0.948
	Behavioural disengagement	1	4	2.39	0.850
Problem-Focused	Active Coping	1	4	2.41	0.800
	Use of informational support	1	4	2.56	0.863
	Positive reframing	1	4	2.56	0.970
	Planning	1	4	2.78	0.750
Emotional-Focused	Emotional Support	1	4	2.55	0.781
	venting	1	4	2.55	0.781
	Self-blame	1	4	2.58	0.892
	Humour	1	4	2.98	0.812
	Acceptance	1	4	2.64	0.809
	Religion	1	4	2.78	0.756
Overall mean		1	4	2.55	0.365

1.18. Sociodemographic characteristics associated with depression and anxiety among HIV patients

The multivariable logistic regression analysis identified several independent predictors of anxiety and depression among the study participants. Female participants had significantly higher odds of both anxiety (AOR = 2.08, 95% CI: 1.21–3.59, $p = 0.009$) and depression (AOR = 3.72, 95% CI: 1.53–9.05, $p = 0.004$) than males. Participants aged 30–49 years were significantly less likely to experience depression than those aged 18–29 years (AOR = 0.16, 95% CI: 0.05–0.50, $p = 0.002$), while age was not significantly associated with anxiety.

Educational attainment was independently associated with anxiety, with participants having secondary (AOR = 5.32, $p = 0.027$) and undergraduate education (AOR = 5.04, $p = 0.016$) exhibiting significantly higher odds compared with those with primary education. Undergraduate education was also significantly associated with depression (AOR = 7.67, $p = 0.021$). Occupational status significantly influenced anxiety, with self-employed (AOR = 2.52, $p = 0.021$), employed (AOR = 2.57, $p = 0.003$), and particularly unemployed participants (AOR = 5.43, $p < 0.001$) having higher odds than students. In

contrast, employed participants were significantly less likely to experience depression (AOR = 0.32, $p = 0.039$).

Religion was significantly associated with anxiety, with Christians having higher odds than Muslims (AOR = 1.88, $p = 0.021$), but it was not associated with depression. Participants earning Le 801–3,000 per month had significantly lower odds of depression (AOR = 0.07, $p < 0.001$) than those earning $\leq$ Le 800. Residence and marital status were not significantly associated with either anxiety or depression after adjustment for potential confounders. Overall, female gender, educational level, occupation, and religion were the main determinants of anxiety, while female gender, younger age, undergraduate education, employment status, and moderate income were the key independent predictors of depression. As shown in **Table 4**.

Table 4. Sociodemographic Characteristics Associated with Anxiety and Depression Among People Living with HIV/AIDS, October 2024

Variable	Sub-variable	Anxiety		Depression	
		AOR 95% CI	p-value	AOR 95% CI	p-value
Age (years)	18-29	1		1	
	30-49	1.34 (0.64-2.78)	0.439	0.16 (0.05-0.50)	0.002
	>50	1.90 (0.92-3.91)	0.081	0.74 (0.32-1.72)	0.476
Gender	Male	1		1	
	Female	2.08 (1.21-3.59)	0.009	3.72 (1.53-9.05)	0.004
Residence	East End	1		1	
	West End	0.66 (0.34-1.30)	0.226	1.07 (0.39-2.96)	0.890
	Central	0.56 (0.31-1.01)	0.055	0.88 (0.36-2.12)	0.771
Religion	Islam	1		1	
	Christianity	1.88 (1.10-3.23)	0.021	1.16 (0.53-2.54)	0.718
Marital Status	Single	1		1	
	Married	0.90 (0.49-1.63)	0.722	0.65 (0.27-1.57)	0.341
Educational Level	Primary	1		1	
	Secondary	5.32 (1.21-23.44)	0.027	6.11 (0.74-50.81)	0.094
	Undergraduate	5.04 (1.35-18.79)	0.016	7.67 (1.36-43.32)	0.021
	Postgraduate	3.27 (0.90-11.86)	0.071	5.06 (0.96-26.60)	0.055
Occupation	Student	1		1	
	Self-employed	2.524(1.149-5.540)	0.021	0.854(0.197-3.696)	0.833
	Employed	2.574(1.389-4.772)	0.003	0.320(0.109-0.942)	0.039
	Unemployed	5.429(2.444-12.061)	<0.001	1.075(0.372-3.110)	0.894
Income of Patient (in Leones)	$\leq$ 800	1		1	
	801-3,000	0.468(0.194-1.130)	0.091	0.068(0.021-0.217)	<0.001
	$\geq$ 3,001	0.606(0.244-1.501)	0.279	0.527(0.196-1.416)	0.204

Statistical significance $P=0.005$

1.19. Clinical Characteristics of the Study Participants

Table 5 presents the clinical characteristics of the study participants. The majority of participants (330; 78.2%) were receiving the standard first-line antiretroviral regimen of Tenofovir, Lamivudine, and Dolutegravir (TLD), while 92 (21.8%) were on other antiretroviral medications. Most participants (403; 95.5%) reported no interruption in their antiretroviral therapy, with only 19 (5.5%) indicating treatment interruption.

A large proportion of participants (355; 84.1%) had been prescribed medications for conditions other than HIV. The most commonly prescribed medications were Septrin and Novalgin (178; 48.6%), followed by Malfan and Amoxicillin (76; 20.8%), Paracetamol and Ciprofloxacin (53; 14.5%), Metformin and

Gentamicin (31; 8.5%), Advit and Pinoplex syrup (17; 4.6%), and Bi-cortem and Wellman (11; 3.0%). These prescriptions were primarily for pain and common cold (171; 50.1%), followed by malaria (63; 18.5%), bacterial infections (55; 16.1%), fever (30; 8.8%), diabetes (12; 3.5%), and hypotension (10; 2.9%). Regarding treatment adherence, most participants (347; 82.2%) were less likely to interrupt their antiretroviral therapy, whereas 71 (16.8%) were considered more likely to interrupt treatment and only 4 (0.9%) were likely to interrupt therapy. More than half of the participants (279; 52.3%) reported no recreational drug use, while alcohol and marijuana use were each reported by 112 (21.0%) participants, and tobacco use by 30 (5.6%). Furthermore, the majority of participants (350; 82.9%) attended routine HIV follow-up visits, whereas 72 (17.1%) did not.

Table 5. Clinical Characteristics of People Living with HIV/AIDS October 2024

Variable	Sub-variable	Frequency	Percent
Name of medication taken by the patient	Tenofovir, Lamivudine, and Dolutegravir (TLD)	330	78.2
	Other Antiviral medication	92	21.8
Patient Anti-HIV medication interruption	Yes	19	5.5
	No	403	95.5
Patient Prescribed Medication for other medical reasons	Yes	355	84.1
	No	67	15.9
Prescribed drug name	Septtrin and Novalgin	178	48.6
	Malfan and Amoxicillin	76	20.8
	Paracetamol and Cipro	53	14.5
	Bi-cortem and Wellman	11	3.0
	Metformin and Gentamicin	31	8.5
	Advit and Pinoplex syrup	17	4.6
Prescription reason	Pain and cold	171	50.1
	Malaria	63	18.5
	Bacterial infection	55	16.1
	Diabetes	12	3.5
	Fever	30	8.8
	Hypotension	10	2.9
Patient currently taking Anti-HIV/AIDS treatment	More likely to interrupt	71	16.8
	Less likely to interrupt	347	82.2
	Likely to interrupt	4	0.9
Patient consumption of recreational drugs	Alcohol	112	21.0
	Tobacco	30	5.6
	Marijuana	112	21.0
	None	279	52.3
Patient visit for routine HIV follow up	Yes	350	82.9
	No	72	17.1

Discussion

This study demonstrates a high burden of psychological impairment among people living with HIV/AIDS (PLWHA) in Sierra Leone despite widespread access to antiretroviral therapy (ART). More than two-thirds of participants experienced anxiety symptoms, and approximately 90% reported mild or symptomatic depression, highlighting that mental health remains a significant component of HIV care (5,6).

The prevalence of anxiety observed in this study is consistent with recent evidence showing that PLWHA experience significantly higher rates of anxiety than the general population because of HIV-related stigma, fear of disease progression, financial insecurity, and social isolation (5,6). Similarly, the high

prevalence of depression corroborates findings from studies conducted across sub-Saharan Africa, where depression remains one of the most common mental health disorders among PLWHA and is associated with poor ART adherence, reduced viral suppression, and increased mortality (6,7).

Women demonstrated significantly greater odds of both anxiety and depression than men after adjustment for potential confounding factors. This finding is consistent with evidence from sub-Saharan Africa, where women living with HIV frequently experience multiple intersecting vulnerabilities, including gender-based discrimination, caregiving responsibilities, financial dependence, intimate partner violence, and greater exposure to HIV-related stigma. These cumulative stressors may contribute to increased psychological distress and reduced emotional wellbeing. Additionally, women often bear greater family and caregiving responsibilities while simultaneously managing chronic HIV treatment, further increasing emotional burden. These findings underscore the importance of implementing gender-sensitive mental health interventions within HIV care programmes (4,19,20).

Participants aged 30-49 years demonstrated significantly lower odds of depression compared with younger adults aged 18-29 years. Younger adults frequently experience greater uncertainty regarding educational attainment, employment opportunities, intimate relationships, marriage, and future aspirations following HIV diagnosis. They may also encounter greater HIV-related stigma, disclosure concerns, and social isolation, increasing vulnerability to depression. Conversely, older adults may have developed stronger coping skills through accumulated life experiences and longer adaptation to chronic disease management. Previous studies have similarly shown that younger PLWHA often experience greater emotional distress because of concerns related to disclosure, relationships, employment, and uncertainty regarding future life opportunities (4,6).

Educational attainment was positively associated with anxiety and depression in this study. Although education generally improves health literacy, studies from resource-limited settings suggest that better-educated individuals may have greater awareness of HIV-related complications and socioeconomic consequences, thereby increasing psychological distress (6,13).

Occupation and income were important determinants of mental health. Unemployment was independently associated with anxiety among study participants. Employment provides financial security, social identity, and opportunities for social interaction, all of which contribute positively to mental wellbeing. Conversely, unemployment may exacerbate poverty, reduce self-esteem, limit access to social support, and increase concerns regarding future economic stability. These socioeconomic stressors may intensify psychological distress among people living with HIV. The findings therefore reinforce the importance of integrating livelihood support and social protection interventions within HIV programmes and corroborate with previous studies demonstrating that poverty and unemployment are major social determinants of psychological distress among PLWHA (6,20,21).

Participants predominantly employed adaptive coping mechanisms including humour, planning, religious coping, acceptance, and seeking informational support. These findings suggest that many individuals actively engaged in constructive psychological adaptation despite living with a chronic illness. Religious

coping was among the most frequently adopted strategies, reflecting the important role of spirituality within Sierra Leonean society as a source of emotional resilience and hope. Nevertheless, the relatively high utilisation of denial and substance use indicates that a considerable proportion of participants continue to employ maladaptive coping responses that may compromise adherence to treatment, psychological recovery, and overall quality of life. These findings highlight the need for routine psychosocial assessment to identify individuals relying on ineffective coping mechanisms and provide targeted behavioural interventions. Similar findings have been reported in systematic reviews showing that resilience, spirituality, social support, acceptance, and positive reframing improve psychological wellbeing and treatment adherence among PLWHA (20,21). However, denial and substance use remained common maladaptive coping strategies, which have consistently been associated with poorer mental health outcomes and reduced adherence to ART (24,25).

Religious coping emerged as one of the most frequently adopted adaptive strategies among participants. This finding is consistent with evidence from many sub-Saharan African countries where spirituality represents an important source of emotional support, hope, resilience, and acceptance among people living with chronic illnesses. Religious communities frequently provide social support networks that reduce feelings of isolation and facilitate psychological adjustment following HIV diagnosis. Consequently, collaboration between HIV programmes, faith leaders, and community organisations may represent an effective strategy for strengthening psychosocial support services.

The predominance of adaptive coping strategies such as planning, acceptance, humour, and informational support suggests that many participants had developed positive psychological adjustment following HIV diagnosis. Nevertheless, the continued reliance on maladaptive coping mechanisms, particularly denial and substance use among a subset of participants, indicates that routine psychosocial assessment remains essential for identifying individuals requiring targeted behavioural interventions before these maladaptive behaviours adversely affect ART adherence and mental wellbeing.

The findings have important implications for HIV programme implementation in Sierra Leone and other low-resource settings. Although remarkable progress has been achieved in expanding antiretroviral therapy coverage, mental health services remain inadequately integrated within routine HIV care. The high prevalence of anxiety and depression observed in this study suggests that many patients receiving ART may not be benefiting fully from treatment because untreated psychological disorders negatively influence adherence, retention in care, viral suppression, and overall quality of life. Integrating routine mental health screening, psychosocial counselling, peer-support programmes, and referral pathways into HIV services could substantially improve treatment outcomes. Furthermore, strengthening collaboration between HIV programmes and mental health services aligns with current WHO recommendations for person-centred HIV care and contributes to achieving the UNAIDS 95-95-95 targets by improving long-term treatment engagement.

Future studies should employ longitudinal cohort designs to establish causal relationships between psychological impairment and HIV treatment outcomes. Mixed-methods studies incorporating qualitative interviews would provide a deeper understanding of the contextual factors influencing coping behaviours among people living with HIV in Sierra Leone. Future research should also investigate the roles of HIV-related stigma, resilience, perceived social support, viral suppression, CD4 count, ART duration, and treatment adherence as potential mediators of psychological wellbeing.

The findings emphasize that successful HIV treatment should extend beyond viral suppression to include routine mental health screening, psychosocial counselling, stigma reduction, and structured peer-support programmes. The World Health Organization and UNAIDS recommend integrating mental health services into routine HIV care to improve quality of life, retention in care, and long-term treatment outcomes (26,27).

1.21. Policy Implications

The findings have significant implications for HIV policy and programme implementation in Sierra Leone. Although the National HIV Programme has achieved considerable success in expanding access to antiretroviral therapy, psychological wellbeing has received comparatively limited attention within routine HIV care. Integration of standardized mental health screening tools into ART clinics would facilitate early identification of anxiety and depression. Furthermore, strengthening referral pathways between HIV clinics and mental health services would improve continuity of psychological care. At the national level, incorporating psychosocial support indicators into HIV programme monitoring systems would enable routine evaluation of mental health outcomes alongside traditional HIV treatment indicators.

1.22. Clinical Practice Implications

Healthcare workers providing HIV care should receive competency-based training in psychological first aid, brief mental health assessment, counselling techniques, and referral mechanisms. Multidisciplinary HIV care teams should include mental health professionals wherever feasible. Routine psychosocial assessment should become an integral component of HIV follow-up visits, particularly for women, younger adults, unemployed individuals, and patients demonstrating maladaptive coping behaviours.

1.23. Conclusion

This study demonstrates that psychological impairment remains highly prevalent among adults living with HIV receiving antiretroviral therapy in Sierra Leone despite substantial progress in HIV treatment services. The findings highlight the need to integrate routine mental health screening, psychosocial counselling, and evidence-based coping interventions into comprehensive HIV care. Particular attention should be directed toward women, younger adults, unemployed individuals, and economically disadvantaged patients who are disproportionately affected by anxiety and depression. Strengthening

integrated mental health services within HIV programmes has the potential to improve treatment adherence, retention in care, quality of life, and overall HIV treatment outcomes.

1.24. Recommendations

Mental health screening using validated tools such as the Hospital Anxiety and Depression Scale should become a routine component of HIV care at all ART clinics in Sierra Leone. Healthcare workers should receive regular training in mental health assessment, counselling, and referral pathways to facilitate early identification and management of psychological disorders. HIV treatment facilities should establish multidisciplinary psychosocial support programmes incorporating peer-support groups, cognitive behavioural therapy, resilience-building interventions, and substance-use counselling. National HIV programmes should prioritize vulnerable populations identified in this study through targeted social protection and stigma-reduction initiatives. Future longitudinal and mixed-methods studies incorporating clinical indicators such as viral load, CD4 count, ART adherence, HIV-related stigma, and social support are recommended to better understand the causal pathways linking psychological impairment and HIV treatment outcomes.

1.25. Strengths of the Study

This study represents one of the first comprehensive assessments of psychological impairment and coping strategies among adults living with HIV in Sierra Leone. The study included participants from the country's three largest HIV treatment centres, thereby enhancing the representativeness of urban HIV care settings. Furthermore, internationally validated instruments (Hospital Anxiety and Depression Scale and Brief-COPE Inventory) were employed, increasing the reliability and comparability of findings with previous international studies. Finally, multivariable regression analysis enabled identification of independent predictors of anxiety and depression after adjustment for potential confounding variables.

1.26. Study Limitations

Several limitations should be considered when interpreting these findings. First, the analytical cross-sectional design precludes establishment of causal relationships between psychological impairment and associated factors. Second, participants were recruited from only three government HIV treatment facilities in Western Area Urban, thereby limiting generalizability to rural populations and private healthcare facilities. Third, consecutive sampling may have excluded individuals with poor clinic attendance who may experience greater psychological distress, thereby introducing selection bias. Fourth, psychological outcomes and coping behaviours were measured using self-reported questionnaires and may therefore be subject to recall bias and social desirability bias. Although validated screening instruments were employed, HADS identifies symptoms rather than providing formal psychiatric diagnoses. Finally, important clinical variables such as viral load suppression, CD4 cell count, ART duration, HIV-related stigma, perceived social support, previous psychiatric illness, and objective measures of treatment adherence were not included in the regression models and may have resulted in residual confounding.

Finally, because the study population comprised individuals actively attending HIV clinics, the findings may underestimate the true burden of psychological impairment among persons disengaged from HIV care, who may experience greater mental health challenges and poorer treatment outcomes.

Declarations

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Data Availability Statement

Data Availability: The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

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References

1. Cohn LB, Chomont N, Deeks SG. The Biology of the HIV-1 Latent Reservoir and Implications for Cure Strategies. *Cell Host Microbe*. 2020;27(4):519–30. 10.1016/j.chom.2020.03.014.
2. WHO. HIV data and statistics [Internet]. 2025 [cited 2026 Jun 30]. Available from: <https://www.who.int/teams/global-hiv-hepatitis-and-stis-programmes/hiv/strategic-information/hiv-data-and-statistics>
3. Panayi M, Charalambous GK, Jelastopulu E. Enhancing quality of life and medication adherence for people living with HIV: the impact of an information system. *J Patient-Rep Outcomes*. 2024;8:10. 10.1186/s41687-023-00680-x . PubMed PMID: 38261120; PubMed Central PMCID: PMC10805742.

4. Moges NA, Adesina OA, Okunlola MA, Berhane Y, Akinyemi JO. Psychological Distress and Its Correlates among Newly Diagnosed People Living with HIV in Northwest Ethiopia: Ordinal Logistic Regression Analyses. *Infect Dis.* 2021;14:1178633721994598. doi:10.1177/1178633721994598 PubMed PMID: 33642865; PubMed Central PMCID: PMC7890707.
5. Ji J, Zhang Y, Ma Y, Jia L, Cai M, Li Z, et al. People who living with HIV/AIDS also have a high prevalence of anxiety disorders: a systematic review and meta-analysis. *Front Psychiatry.* 2024;15:1259290. 10.3389/fpsyt.2024.1259290 . PubMed PMID: 38380124; PubMed Central PMCID: PMC10877523.
6. Xue Q, He Q, Zhu Z, Yang H, He X. Global prevalence and biopsychosocial correlates of psychological distress among people living with HIV: an updated theory-informed meta-analysis. *Front Public Health.* 2026;14:1832557. 10.3389/fpubh.2026.1832557.
7. Zeleke TA, Ayele TA, Denu ZA, Mwanri L, Azale T. The effect of depression on antiretroviral drug non-adherence among women living with HIV in Gondar health facilities, northwest Ethiopia: a prospective cohort study. *Front Psychiatry.* 2025;16:1488183. 10.3389/fpsyt.2025.1488183.
8. Amal AI, Sukartini T, Kurniawati ND, Sulistyaningsih DR. Suyanto Suyanto, Indah Sri Wahyuningsih. Analysis of Coping Strategies and Self-Stigma Among People Living with HIV (PLHIV): A Cross Sectional Study. *Open Public Health J* 17. <https://doi.org/10.2174/0118749445304007240328052310>
9. Brown JL, Venable PA. Cognitive–Behavioral Stress Management Interventions for Persons Living with HIV: A Review and Critique of the Literature. *Ann Behav Med.* 2008;35(1):26–40. 10.1007/s12160-007-9010-y.
10. Conduah AK, Essiaw MN, Ofoe SH. Coping With Chronic Illness: A Systematic Review of Adaptive Strategies Across Cancer, COPD, Diabetes and Heart Disease. *Public Health Chall.* 2025;4(4):e70129. 10.1002/puh2.70129.
11. Chepkemol S, Nyikavaranda P, Semrau M, Archer G, Pantelic M. Resilience resources for mental health among people living with HIV: a mixed-method systematic review. *AIDS Care.* 2024;36(7):849–63. 10.1080/09540121.2024.2303613 . PubMed PMID: 38319898.
12. Adediji WA, Ishola AG, Elugbadebo O, Oladepo OM, Mudzviti T, Kaiyo-Utete M, et al. Mental health disorders among people living with HIV in sub-Saharan Africa: a scoping review protocol. *BMJ Open.* 2025;15(9):e105301. 10.1136/bmjopen-2025-105301.
13. Özdemir HÖ, Karaman Kabadurmuş FN, Özdemir D. The Impact of Socioeconomic Factors on the HIV-Related Stigma of People Living With HIV in Turkey. *Inq J Med Care Organ Provis Financ.* 2025;62:00469580251319926. doi:10.1177/00469580251319926 PubMed PMID: 40215394; PubMed Central PMCID: PMC12033420.
14. UNICEF. Living positively with HIV – thanks to steady flow of ARVs | UNICEF Sierra Leone [Internet]. 2021 [cited 2026 Jun 30]. Available from: <https://www.unicef.org/sierraleone/stories/living-positively-hiv-thanks-steady-flow-arvs>

15. Baldeh M, Kizito S. Call to action: HIV among adolescents in Sierra Leone. *Lancet Lond Engl*. 2023;402(10409):1240. 10.1016/S0140-6736. (23)01788-9 PubMed PMID: 37805214; PubMed Central PMCID: PMC11095044.
16. Girma A, Ayalew E, Mesafint G. Covid-19 Pandemic-Related Stress and Coping Strategies Among Adults with Chronic Disease in Southwest Ethiopia. *Neuropsychiatr Dis Treat* 2021;Volume 17:1551–61. 10.2147/NDT.S308394
17. HADS. Hospital Anxiety and Depression Scale (HADS) [Internet]. 1983 [cited 2026 Apr 8]. Available from: <https://batemanhornecenter.org/wp-content/uploads/2020/05/HADS-PDF>
18. Brief-COPE. (Brief-COPE). 2018;2.
19. Armoon B, Fleury MJ, Bayat AH, Fakhri Y, Higgs P, Moghaddam LF, et al. HIV related stigma associated with social support, alcohol use disorders, depression, anxiety, and suicidal ideation among people living with HIV: a systematic review and meta-analysis. *Int J Ment Health Syst*. 2022;16(1):17. 10.1186/s13033-022-00527-. w PubMed PMID: 35246211; PubMed Central PMCID: PMC8896327.
20. Fauk NK, Ward PR, Hawke K, Mwanri L. HIV Stigma and Discrimination: Perspectives and Personal Experiences of Healthcare Providers in Yogyakarta and Belu, Indonesia. *Front Med*. 2021;8:625787. 10.3389/fmed.2021.625787 . PubMed PMID: 34055824; PubMed Central PMCID: PMC8149745.
21. UNAIDS. The Urgency of Now: AIDS at a Crossroads [Internet]. 2024. Available from: https://www.unaids.org/sites/default/files/media_asset/2024-unaids-global-aids-update_en.pdf
22. Chepkemai S, Nyikavaranda P, Semrau M, Archer G, Pantelic M. Resilience resources for mental health among people living with HIV: a mixed-method systematic review. *AIDS Care*. 2024;36(7):849–63. 10.1080/09540121.2024.2303613.
23. Amal AI, Sukartini T, Kurniawati ND, Sulistyaningsih DR, Suyanto S, Wahyuningsih IS. Analysis of Coping Strategies and Self-Stigma Among People Living with HIV (PLHIV): A Cross Sectional Study. *Open Public Health J*. 2024;17(1):e18749445304007. 10.2174/0118749445304007240328052310.
24. Bhatta DN, Liabsuetrakul T, McNeil EB. Social and behavioral interventions for improving quality of life of HIV infected people receiving antiretroviral therapy: a systematic review and meta-analysis. *Health Qual Life Outcomes*. 2017;15:80. 10.1186/s12955-017-0662-4 . PubMed PMID: 28438211; PubMed Central PMCID: PMC5404320.
25. Conduah AK, Essiaw MN, Ofoe SH. Coping With Chronic Illness: A Systematic Review of Adaptive Strategies Across Cancer, COPD, Diabetes and Heart Disease. *Public Health Chall*. 2025;4(4):e70129. 10.1002/puh2. 70129 PubMed PMID: 41140532; PubMed Central PMCID: PMC12552898.
26. WHO. Consolidated guidelines on HIV prevention, testing, treatment, service delivery and monitoring: recommendations for a public health approach [Internet]. 2021 [cited 2026 Jul 15]. Available from: <https://www.who.int/publications/i/item/9789240031593>
27. WHO. HIV statistics, globally and by WHO region, 2025 [Internet]. 2024 [cited 2026 Jul 15]. Available from: <https://cdn.who.int/media/docs/default-source/hq-hiv-hepatitis-and-stis-library/who-ias-hiv->

