

Prevalence of Depression and Generalized Anxiety Disorder and their Contributing Factors among Older People Receiving HIV Treatment in Homa Bay County, Kenya.

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ABSTRACT

Mental health disorders have increased substantially over the past two decades and are a major contributor to the global burden of disease. Despite advances in HIV diagnosis, treatment, and management, older people living with HIV remain vulnerable to mental health conditions, particularly depression and generalized anxiety disorder (GAD). This study examined the prevalence of depression and generalized anxiety disorder among older people receiving HIV treatment in Homa Bay Township Sub-County, Homa Bay County, Kenya. The study adopted a descriptive cross-sectional research design guided by the Biopsychosocial Model. The target population comprised 4,288 older people receiving HIV treatment, from whom a sample of 372 participants was selected using systematic random sampling. Data were collected using a structured questionnaire. Face and content validity were established through expert review, and data were analysed using descriptive statistics (frequencies, percentages, means, and standard deviations). Qualitative responses were analysed thematically. A total of 355 participants aged 50 years and above were included in the analysis, representing a response rate of 95.4%. Overall, 47.6% of the participants had moderate to severe depressive symptoms (PHQ-9 score ≥ 10), while 43.4% had moderate to severe generalized anxiety symptoms (GAD-7 score ≥ 10). Loss of a loved one HIV-related inflammation, sleeplessness stigma and discrimination and opportunistic infections were the most highly perceived factors contributing to depression and anxiety. Participants recommended strengthening counselling and psychological support, integrating routine mental health screening into HIV care, establishing peer support groups among others to improve mental health outcomes. The study concludes that depression and generalized anxiety disorder are common among older people receiving HIV treatment in Homa Bay Township Sub-County.

Key words; Depression, Mental disorder, prevalence, anxiety disorder

INTRODUCTION

Despite the introduction and scale up of better HIV testing and treatment models, people living with HIV (PLHIV) still face numerous challenges. Various structural factors like policy, stigma and poverty have negative health and social outcomes on the physical and mental health for PLWHIV (Algarin, 2019). Depression and generalized anxiety disorder are common mental disorders. Globally, it is estimated that 5% of adults suffer from depression (Global Burden of Disease, 2021, WHO 2025). Depression is characterized by persistent sadness and a lack of interest or pleasure in previously rewarding or enjoyable activities (Salik, 2022). It can also disturb sleep and appetite. Tiredness and poor concentration are common. Depression is a leading cause of disability around the world and contributes greatly to the global burden of disease (WHO 2025). According to the Institute of Health Metrics and Evaluation (2024), approximately 332 million people in the world have depression. Mental health conditions among PLHIV are rampant. Before the outbreak of COVID -19 the prevalence of depressive disorders was 32% among PLHIV in sub-Saharan Africa (Benard, 2017), 38% in East Africa and 50% in China (Wang, 2018) against the global prevalence of 28% (Tang, 2019). Therefore, the objective of the study was to establish the prevalence of depression and generalized anxiety disorder among older people on HIV treatment in Township Sub-county of Homa Bay County.

Since the beginning of the HIV epidemic, 84.2 million people have been infected with HIV, and about 40.1 million people have died of HIV-related illnesses. As of 2026, an estimated 40 million people were living with HIV globally, reflecting a gradual increase from previous years, including 36.7 million in 2016 (Autenriech, 2018) and 37.7 million in 2021 (WHO, 2026). The rapid increase in older PLWH is driven by effective antiretroviral therapy (ART) and new HIV infections among older adults (Sabin, 2017; WHO, 2026). The African region remains the most severely affected, with nearly 1 in every 30 adults (3.4%) living with HIV and accounting for more than two-thirds of people living with HIV worldwide (WHO, 2025). In Kenya, approximately 1,435,271 people were living with HIV in 2022, and an estimated 85% of them were on antiretroviral therapy (NSDCC, 2022).

Ageing is a biological process involving changes at the cellular level, leading to an overall decrease in normal physiological reserves (Steves, Spector, & Jackson, 2021). HIV is known to accelerate ageing through increased loss of reserves. This accelerated ageing among many people with HIV is associated with behavioral and neurological changes at a higher rate than in the general population (Effros et al., 2008). Studies have shown that people aged 50 years and above living with HIV experience higher rates of depression and cognitive dysfunction compared with adults without HIV (Holodniy & Nguyen, 2008).

Several studies have found that depressed older people had a higher mortality rate (Brown et al., 2011; Djernes et al., 2011) poorer outcomes than younger patients (Licht-Strunk et al., 2009).

In Kenya, a study conducted by Ng'ang'a et al. (2018) showed that many patients with HIV and AIDS receiving care experienced considerable mental health disorders. Female sex and low socio-economic status were the most important risk factors. More rigorous research is recommended to highlight the need for mental health services for older people on HIV treatment in Africa.

A cross-sectional study was conducted among 424 HIV patients attending the HIV/AIDS clinic of the Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria. Hospital Anxiety and Depression Scale was used to assess the prevalence of depression and anxiety in the study and control groups. Anxiety was reported among PLHIV and the control group at 32.6% and 28.7%, respectively. Female gender, illiteracy, being divorced or widowed, unemployment, low income, and low CD4 count were associated with depression, while factors associated with anxiety disorder included younger age, female gender, low income, and low CD4 count (Adeoti et al., 2018).

An institution-based cross-sectional study was carried out from March to May 2015 among 411 adults with HIV/AIDS on ART clinic follow-up in Aksum town, Tigray regional state of Ethiopia, to assess the prevalence of depression. Participants were selected using systematic random sampling techniques. Data were collected using chart review and interviewer-administered techniques. Both bivariable and multivariable logistic regressions were used to test associations using SPSS version 20. The prevalence of depression was 14.6% (95% CI: 10.90–18.2). Factors independently associated with depression were non-adherence to ART, eating two meals per day or less, having ART medication side effects, being in WHO Stage II or above of HIV/AIDS, and living alone (Berhe et al., 2018).

Generalized anxiety disorder is a type of anxiety disorder characterized by persistent and excessive worry that is difficult to control. In a study estimating the prevalence of GAD symptoms among adults with diagnosed HIV in the USA, Beer et al. (2019) used the Medical Monitoring Project tool. They found that GAD symptoms among people with HIV were 19%. The symptoms were associated with low ART adherence and sustained viral load suppression. In a descriptive cross-sectional study of 205 PLHIV receiving treatment at a comprehensive care centre in Mbagathi Hospital in Nairobi, Kenya, Gacau et al. (2024) found that 29.3% had an anxiety disorder.

In another cross-sectional facility-based study, 357 HIV-positive women were recruited using systematic sampling from two public hospitals in Jijiga town, Ethiopia. The Hospital Anxiety and Depression Scale (HADS) was administered for screening, followed by a pre-tested questionnaire comprising perceived social support and HIV stigma measures. The results revealed that the prevalence of anxiety and depression among HIV-positive women was 28.9% and 32.5%, respectively (Abdilahi, 2020). Multivariate analysis showed that lack of formal education, being divorced, unemployment, and earning a monthly income of less than 1,400 ETB (37.5 USD)

were significantly associated with depression. Women with symptomatic HIV clinical stage III, CD4 cell count below 250, and co-infections also experienced depression

DATA AND METHODOLOGY

Research Design

This study employed a descriptive cross-sectional study design. A descriptive cross-sectional design involves collecting data from a defined population at a single point in time to describe the distribution of health conditions and other characteristics of interest (Setia, 2016). The design also facilitated the identification of perceived factors contributing to depression and generalized anxiety disorder and the exploration of strategies for improving mental health among older people living with HIV.

Study Setting and Participants

The study was conducted in Homa Bay Township Sub-County, which is located in Homa Bay County in western Kenya. Homa Bay County had an estimated population of 1,131,950 according to the 2019 census. Homa Bay County has an HIV prevalence of 15.2% compared with the national average of 3.3% (NSDCC, 2025). Homa Bay Township Sub-County was chosen for the study because it is a hub of activities, hosts the county headquarters and home to large numbers of key and vulnerable populations. Studies have shown that people aged 50 years and above are more likely to experience mental health stigma than younger adults (Philippe Landreville et al., 2023; Terlizzi & Zablotsky, 2019). The sample size was 353 older clients receiving HIV treatment in Homa Bay Township Sub-County. A systematic random sampling technique was used to select HIV clients aged 50 years and above from the 12 health facilities to participate in the study.

Data Collection Tools and Procedures

Questionnaires were selected as the primary data collection instrument because they provide a standardised and efficient method of collecting information from a relatively large number of respondents. According to John (1992), questionnaires are appropriate when factual information and respondents' perceptions are required. Results from various studies show that the PHQ-9 and GAD-7 are valid screening tools for depression and anxiety, with Cronbach's alpha values of 0.86 and 0.91, respectively. The one-factor structure of the PHQ-9 and GAD-7 was confirmed through confirmatory factor analysis. Data were collected using a systematic random sampling method, in which every *n*th member was selected from a random starting point. Inclusion criteria were HIV-positive aged 50 years and above, receiving care and treatment, and taking ART in one of the 12 health facilities in Homa Bay Township Sub-County. Ethical clearance was obtained from relevant authorities and strict confidentiality protocols were observed throughout the data collection process.

Data Analysis

Data were analyzed using SPSS version 26. Descriptive statistics were used to summarize the quantitative data. Frequencies and percentages were used to describe categorical variables, including socio-demographic characteristics and the prevalence of depression and generalized anxiety disorder. Means and standard deviations were computed to summarize continuous variables and participants' responses to Likert-scale items on factors contributing to depression and generalized anxiety disorder. The PHQ-9 and GAD-7 questionnaires were scored according to their respective standard scoring guidelines. Qualitative responses obtained from the open-ended question on strategies for improving mental health were analyzed using thematic analysis. Similar responses were grouped into themes, and representative participant quotations were used to illustrate each theme. The study findings were presented using tables, frequencies, percentages, means, standard deviations, and narrative descriptions.

RESULTS

This section presents the results of the data analysis and discusses the findings in relation to the study objectives. The chapter describes the socio-demographic characteristics of the study participants, the prevalence and severity of depression and generalized anxiety disorder, the distribution of these conditions across selected socio-demographic characteristics, perceived contributing factors, and suggested strategies for improving mental health among older people receiving HIV treatment.

A total of 355 participants were enrolled in the study out of the targeted sample of 372, yielding a response rate of 95.4%. The socio-demographic characteristics of the respondents are presented in Table 2. The mean age of the participants was 60.4 ± 7.7 years, with a median age of 59 years (IQR: 54–66 years). The largest proportion of respondents (34.1%) were aged 50–55 years, while 60.3% were between 50 and 61 years of age.

More than half of the respondents (55.2%) were female, while 44.8% were male. Most participants were married (58.9%), followed by those who were widowed (32.7%). The majority had attained primary education (61.4%), whereas 26.5% had secondary education and 11.5% had tertiary or university education. More than half of the respondents (56.9%) were unemployed, while 24.8% were self-employed, 11.5% were retired, and 6.8% were in formal employment. Participants had been on antiretroviral therapy (ART) for a mean duration of 9.8 ± 5.6 years (median = 10 years; IQR: 7–12 years). The socio-demographic characteristics of the study participants are summarised in Table 2.

Table 2: Socio-demographic Characteristics of the Study Participants (N = 355)			
Characteristic	Category	n	%
Age group (years)	50–55	121	34.1
	56–61	93	26.2
	62–67	65	18.3
	≥68	76	21.4
Age (years)	Mean ± SD	60.4 ± 7.7	
	Median (IQR)	59 (54–66)	
Gender	Male	159	44.8
	Female	196	55.2
Marital status	Single	4	1.1
	Married	209	58.9
	Divorced	26	7.3
	Widowed	116	32.7
Education level	None	2	0.6
	Primary	218	61.4
	Secondary	94	26.5
	Tertiary/College	32	9.0
	University	9	2.5
Employment status	Formal employment	24	6.8
	Self-employed	88	24.8
	Unemployed	202	56.9
	Retired	41	11.5
Duration on ART (years)	Mean ± SD	9.8 ± 5.6	
	Median (IQR)	10 (7–12)	

Table 3 presents the distribution of depression severity among the study participants based on the PHQ-9 classification. More than one-third of the respondents (36.3%) had mild depressive symptoms, while 28.2% had moderate depression and 19.4% had severe depression. Only 16.1% of the participants had minimal depressive symptoms. Overall, 169 participants (47.6%) had moderate to severe depressive symptoms (PHQ-9 score ≥ 10), indicating a substantial burden of depression among older people receiving HIV treatment in Homa Bay Township Sub-County. The mean PHQ-9 score was 9.9 ± 5.1 , suggesting that, on average, participants experienced mild depressive symptoms.

Table 3: Distribution of Depression Severity Based on PHQ-9 Scores among Study Participants (N = 355)			
Depression Severity	PHQ-9 score	Frequency (n)	Percentage (%)
Minimal	0–4	57	16.1
Mild	5–9	129	36.3
Moderate	10–14	100	28.2
Severe	15–27	69	19.4
Total		355	100.0
Mean PHQ-9 score ($\pm$SD)		9.9 ± 5.1	

Distribution of Depression by Selected Socio-demographic Characteristics of the Study Participants

Table 4 presents the distribution of depression across selected socio-demographic characteristics of the study participants. Depression was observed among both males and females, with a slightly higher proportion among females (55.4%) than males (44.6%). Participants aged 66 years and above accounted for a larger proportion of those with depression (31.4%) than those without depression (23.7%). Depression was also common among married (60.9%) and widowed (31.4%) participants. In terms of education, most participants with depression had attained primary education (62.7%), while the majority of those with depression were unemployed (61.5%).

Table 4: Distribution of Depression by Selected Socio-demographic Characteristics of the Study Participants (N = 355)			
Characteristic	Category	No Depression n (%) (n = 186)	Depression n (%) (n = 169)
Age group (years)	50–55	68 (36.6)	53 (31.4)
	56–65	74 (39.8)	63 (37.3)
	≥ 66	44 (23.7)	53 (31.4)
Gender	Male	84 (45.2)	75 (44.6)

	Female	102 (54.8)	93 (55.4)
Marital status	Single	3 (1.6)	1 (0.6)
	Married	106 (57.0)	103 (60.9)
	Divorced	14 (7.5)	12 (7.1)
	Widowed	63 (33.9)	53 (31.4)
Level of education	None	1 (0.5)	1 (0.6)
	Primary	112 (60.2)	106 (62.7)
	Secondary	45 (24.2)	49 (29.0)
	Tertiary/College	24 (12.9)	8 (4.7)
	University	4 (2.2)	5 (3.0)
Employment status	Formal employment	18 (9.7)	6 (3.6)
	Self-employed	54 (29.0)	34 (20.1)
	Unemployed	97 (52.2)	104 (61.5)
	Retired	17 (9.1)	24 (14.2)

Distribution of Generalized Anxiety Disorder Severity Based on GAD-7 Scores among Study Participants

Table 5 presents the distribution of generalized anxiety disorder severity among the study participants based on the GAD-7 classification. Approximately 29.0% of the respondents had minimal anxiety symptoms, while 27.6% experienced mild anxiety symptoms. Overall, 43.4% of the participants had moderate to severe anxiety symptoms, comprising 26.2% with moderate anxiety and 17.2% with severe anxiety. The mean GAD-7 score was 8.6 ± 5.1 , indicating that, on average, the respondents experienced mild anxiety symptoms. These findings suggest that generalized anxiety disorder symptoms were common among older people receiving HIV treatment in Homa Bay Township Sub-County. A GAD-7 score of 10 or higher, indicating moderate or severe anxiety, was observed among 154 of the 355 participants (43.4%).

Table 5: *Distribution of Generalized Anxiety Disorder Severity Based on GAD-7 Scores among Study Participants (N = 355)*

Anxiety Severity	GAD-7 Score	Frequency (n)	Percentage (%)
Minimal	0-4	103	29.0

Mild	5-9	98	27.6
Moderate	10-14	93	26.2
Severe	15-21	61	17.2
Total		355	100.0
Mean GAD-7 score: 8.6 ± 5.1		8.6 ± 5.1	

Distribution of Generalized Anxiety Disorder by Selected Socio-demographic Characteristics of the Study Participants

Table 6 presents the distribution of generalized anxiety disorder across selected socio-demographic characteristics of the study participants. Anxiety was slightly more common among female participants (56.9%) than male participants (43.1%). Participants aged 56–65 years constituted the largest proportion of those with anxiety (40.9%). Most participants with anxiety were married (61.0%), while nearly one-third (30.5%) were widowed. The majority of respondents with anxiety had attained primary education (72.1%), and 66.9% were unemployed. These findings indicate that generalized anxiety disorder was distributed across all socio-demographic groups, with higher proportions observed among females, participants with primary education, and those who were unemployed.

Table 6: *Distribution of Generalized Anxiety Disorder by Selected Socio-demographic Characteristics of the Study Participants (N = 355)*

Characteristic	Category	No Anxiety (n = 201)	Anxiety (n = 154)
Age group (years)	50–55	71 (35.3)	50 (32.5)
	56–65	74 (36.8)	63 (40.9)
	≥66	56 (27.9)	41 (26.6)
Gender	Male	93 (46.3)	66 (43.1)
	Female	108 (53.7)	87 (56.9)
Marital status	Single	3 (1.5)	1 (0.6)
	Married	115 (57.2)	94 (61.0)
	Divorced	14 (7.0)	12 (7.8)
	Widowed	69 (34.3)	47 (30.5)
Level of education	None	1 (0.5)	1 (0.6)
	Primary	107 (53.2)	111 (72.1)
	Secondary	58 (28.9)	36 (23.4)
	Tertiary/College	29 (14.4)	3 (1.9)

	University	6 (3.0)	3 (1.9)
Employment status	Formal employed	22 (10.9)	2 (1.3)
	Self-employed	62 (30.8)	26 (16.9)
	Unemployed	98 (48.8)	103 (66.9)
	Retired	19 (9.5)	22 (14.3)

DISCUSSIONS

The findings of this study revealed that depression is common among older people receiving HIV treatment in Homa Bay Township Sub-County. The mean PHQ-9 score was 9.9 (SD = 5.14), while 47.6% of the respondents had a PHQ-9 score of 10 or higher, indicating moderate to severe depressive symptoms. These findings demonstrate that depression remains a significant mental health problem among older people living with HIV and highlight the need for routine mental health assessment as part of comprehensive HIV care. The findings are consistent with previous studies reviewed in Chapter Two. Bernard et al. (2017) reported that the prevalence of depressive disorders among people living with HIV in sub-Saharan Africa was approximately 32%, while Tang (2019) estimated the global prevalence at 28%. Similarly, Adeoti et al. (2018) found a high prevalence of depression among adults receiving HIV treatment in Nigeria and concluded that integrating mental health services into HIV programmes is essential for improving patient outcomes. Likewise, Berhe et al. (2018) reported that depression was a common mental health problem among adults attending HIV treatment clinics in Ethiopia and recommended strengthening counselling, adherence support, and nutritional interventions. These findings support the observation that depression remains a major public health concern among people living with HIV despite increased access to antiretroviral therapy.

The relatively higher prevalence observed in the present study may be explained by the fact that it specifically targeted older people aged 50 years and above, who are more likely to experience multiple psychosocial challenges associated with ageing and long-term HIV infection. As discussed in Chapter Two, studies by Holodniy and Nguyen (2008) and Unitizer et al. (2000) reported that older adults living with HIV experience higher rates of depression and poorer quality of life than younger adults or those without depression. Furthermore, Ng'ang'a et al. (2018) observed that mental disorders are common among people living with HIV in Kenya and recommended greater investment in mental health services.

The findings of this study therefore reinforce the need to integrate routine depression screening into HIV care using validated tools such as the PHQ-9. Early identification of depressive symptoms, coupled with counselling and psychosocial support, would improve treatment adherence, quality of life, and overall health outcomes among older people receiving HIV treatment. This recommendation is consistent with the evidence presented by Berhe et al. (2018) and Adeoti et al. (2018), who emphasised the importance of integrating mental health care into routine HIV services.

The findings showed that generalised anxiety disorder was common among the study participants. Based on the GAD-7 classification, 43.5% of the respondents had moderate to severe anxiety symptoms, while 56.6% had minimal or mild anxiety symptoms. These findings indicate that a substantial proportion of older people receiving HIV treatment experience clinically important anxiety symptoms that may interfere with their emotional well-being, social functioning, treatment adherence, and overall quality of life. The findings are consistent with previous studies reviewed in Chapter Two, which reported that anxiety disorders are common among people living with HIV. Beer et al. (2019) found that approximately 19% of adults living with HIV in the United States had generalised anxiety disorder and reported that anxiety was associated with poor adherence to antiretroviral therapy and lower rates of viral suppression. In Kenya, Gacau et al. (2024) reported an anxiety prevalence of 29.3% among people living with HIV attending a comprehensive care clinic in Nairobi. Similarly, Temesgen et al. (2019) found an anxiety prevalence of 25.6% among adults receiving ART in Ethiopia and recommended routine screening and early management of anxiety as part of HIV care. Adeoti et al. (2018) also

reported high levels of anxiety among people living with HIV in Nigeria and emphasised the need to integrate mental health services into HIV treatment programmes.

The relatively higher prevalence of anxiety observed in the present study may be explained by the fact that the study specifically focused on adults aged 50 years and above, who often face additional challenges associated with ageing, long-term HIV treatment, fear of disease progression, social isolation, stigma, and multiple chronic health conditions. As highlighted in Chapter Two, Holodniy and Nguyen (2008) noted that older people living with HIV experience higher rates of mental health problems than the general population, while Ng'ang'a et al. (2018) observed that mental disorders are common among people living with HIV in Kenya and recommended strengthening mental health services within HIV care.

The findings, therefore, underscore the importance of integrating routine anxiety screening using validated tools such as the GAD-7 into HIV treatment services. Early identification and appropriate psychological interventions, including counselling and psychosocial support, would help improve mental well-being, treatment adherence, and quality of life among older people receiving HIV treatment. This recommendation is consistent with Temesgen et al. (2019) and Adeoti et al. (2018), who emphasised the importance of incorporating mental health services into routine HIV care.

CONCLUSIONS

The study concludes that depression is common among older people receiving HIV treatment in Homa Bay Township Sub-County. Nearly half of the respondents exhibited moderate to severe depressive symptoms based on the PHQ-9 assessment, indicating that depression is a significant mental health concern in this population. These findings underscore the need for routine depression screening and appropriate psychosocial support as part of comprehensive HIV care.

This study established that depression and generalised anxiety disorder are common among older people receiving HIV treatment. Future studies should employ longitudinal or mixed-methods designs to explore the psychosocial, economic, and health-related factors that influence the development and progression of depression and anxiety among older people living with HIV.

REFERENCES

1. Abayomi, O., Adelufosi, A., Adebayo, P., Ighoroje, M., Ajogbon, D., Oqunwale, A. (2013). HIV Risk Behavior in Persons with Severe Mental Disorders in A Psychiatric Hospital in Ogun, Nigeria. *Ann Med Health Sci Res* 2013; 3:380–384.
2. Abdilahi, Y. (2020). Anxiety and Depression Among Women Living with HIV: Prevalence and Correlations College of Medicine and Health Sciences, Jijiga University, Jijiga, Ethiopia
3. Acuda, S.W., Sebit M.B., (1996). Serostatus surveillance testing of HIV-I infection among Zimbabwean psychiatric inpatients, in Zimbabwe. *Cent Afr J Med* 42:254–257.
4. Adeoti, A.O., Dada, M.U., Fadare, J.O. (2018). Prevalence of Depression and Anxiety Disorders in People Living with HIV/AIDS in a Tertiary Hospital in South Western Nigeria. *Med Rep Case Stud* 3: 150. doi:10.4172/2572-5130.1000150
5. Algarin AB, Zhou Z, Cook CL, Cook RL, Ibañez GE (2019). Age, sex, race, ethnicity, sexual orientation: intersectionality of marginalized-group identities and enacted HIV related stigma among people living with HIV in Florida. *AIDS Behav* 23 (11):2992–3001. doi: 10.1007/s10461-019-02629-y
6. Alonso, J., Liu, Z., Evans-Lacko, S., (2018). Treatment gap for anxiety disorders is global: results of the world mental health surveys in 21 countries. *Depress Anxiety*. 35 (3):195–208. Doi:10.1002/Da.22711.
7. American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* Washington, DC: American Psychiatric Association;
8. Antelman, G., Kaaya, S., Wei, R., Mbwambo, J., Msamanga, G.I., Fawzi, W.W, et al (2007). Depressive symptoms increase risk of HIV disease progression and mortality among women in Tanzania. *Acquired Immune Deficiency Syndrome* 44:470–477.
9. Autenrieth, C.S., Beck, E.J, Stelzle D, et al. (2020) Global and regional trends of people living with HIV aged 50 and over: estimates and projections for 2000-2020. *PLo*

10. Badiee, J., Moore, D. J., Atkinson, J. H., Vaida, F., Gerard, M., Duarte, N. A., . . . Grant, I. (2012). Lifetime suicidal ideation and attempt are common among HIV+ individuals. *J Affect Disord*, 136(3), 993-999. doi:10.1016/j.jad.2011.06.044
11. Bavinton, B.R., Pinto A.N., Phanuphak, N., Grinsztejn, B., Prestage, G.P., Zablotska-Manos, I.B., (2018). Viral suppression and HIV transmission in sero discordant male couples: an international, prospective, observational, cohort study. *Lancet HIV*; 5:e438–e447.
12. Beckerman, N.L., & Auerbach, C. (2010). Posttraumatic stress disorder and HIV a snapshot of co-occurrence. *Soc Work Health c*; 49:687–702] .
13. Berhe, B. G. (2018) Depression among adult HIV/AIDS patients attending art clinics at Aksum town, Aksum, Ethiopia: a cross-sectional study. College of Health Sciences, Aksum University, Aksum, Ethiopia
14. Bernard, C., Dabis, F., de Rekeneire, N. (2017). Prevalence and factors associated with depression in people living with HIV in sub-Saharan Africa: a systematic review and meta-analysis' *PLoS One*. 2017;12(8) doi: 10.1371/journal.pone.0181960. e0181960–e0181960.
15. Bhatia, M.S., & Munjal, S. (2014). Prevalence of depression in people living with hiv/aids undergoing art and factors associated with it. *J Clin Diagn Res* 8:Wc01–Wc04.
16. Bing, E.G., Burnam, M.A., Longshore, D., Fleishman, J.A., Sherbourne, C.D., London, A.S. (2001). psychiatric disorders and drug use among human immunodeficiency virus-infected adults in The United States. *Arch Gen Psychiatry* 58:721–728.
17. Bird, S.T., Bogart, L.M. (2001) Perceived race-based and socioeconomic status (ses)-based discrimination in interactions with healthcare providers. *Ethn Dis*; 11:554–563.
18. Bogart, L.M., Wagner, G.J., Galvan, F.H, Landrine, H., Klein, D.J., Sticklor, L.A. (2011). Perceived discrimination and mental health symptoms among black men with HIV. *Cult Divers Ethn Minor Psychol*; 17:295–302.
19. Bonfils, K.A., Firmin, R.L., Salyers, M.P., Wright, E.R. (2015) Sexuality and intimacy among people living with serious mental illnesses: factors contributing to sexual activity. *Psychiatr Rehabil J*; 38:249–255.
20. Chibanda, D. (2017). Reducing the treatment gap for mental, neurological and substance use disorders in Africa: lessons from the friendship bench in Zimbabwe. *Epidemiol Psychiatr Sci*; 26:342–347.
21. Chibanda, D., Mesu, P., Kajawu, L., Cowan, F., Araya, R., Abas, M. (2011). Problem-solving therapy for depression and common mental disorders in Zimbabwe: piloting a task-shifting primary mental health care intervention in a population with a high prevalence of people living with HIV. *BMC Public Health* 11(1): 828.
22. Creswell, J.W (2014) *Research Design: Qualitative, Quantitative and Mixed Methods Approach* (4th ed.). Thousand Oaks: CA Sage
23. Curry, A., Latkin, C., Davey-Rothwell, M. (2008). Pathways to depression: the impact of neighbourhood violent crime on inner-city residents in Baltimore, Maryland, USA. *Soc Sci Med*; 67:23–30.
24. Dale, S.K., Bogart, L.M., Galvan, F.H., Wagner, G.J., Pantalone, D.W., Klein, D.J., (2016). Discrimination and hate crimes in the context of neighbourhood poverty and stressors among HIV-positive African American men who have sex with men. *J Commun Health*; 41:574–583.
25. Do, A.N., Rosenberg, E.S., Sullivan, P.S., Beer L, Strine, T.W., Schulden, J.D., (2014). Excess burden of depression among HIV-infected persons receiving medical care in the United States: data from the medical monitoring project and the behavioral risk factor surveillance system. *PLoS One*; 9:e92842.
26. Dowdall, N., Ward, C.L., Lund, C. (2017). The association between neighbourhood-level deprivation and depression: evidence from the south African national income dynamics study. *BMC Psychiatry*; 17:395.
27. Effros, R.B., Fletcher, C.V., Gebo, K., Halter, J.B., Hazzard, W.R., Horne, F.M. (2008) Aging and infectious diseases: workshop on HIV infection and aging: what is known and future research directions. *Clinical Infectious Diseases*.
28. Engel, G. L. (1977). The need for a new medical model: a challenge for biomedicine. *Science* (New York, N.Y.).
29. Engel, G. L. (1982). The Biopsychosocial model and medical education. *New England Journal of Medicine*, 306(13), 802–805. doi: 10.1056/nejm198204013061311

30. Evans, D.L., Charney, D.S., Lewis, L., Golden, R.N., Gorman, J.M., Krishnan, K.R. (2005) Mood disorders in the medically ill: scientific review and recommendations. *Biological Psychiatry*. Aug; 58 (3):175–89.
31. Fialho, R., Pereira, M., Rusted, J., Whale, R. (2017). Depression in HIV and HCV co-infected patients: a systematic review and meta-analysis. *Psychol Health Med*; 22:1089–1104.
32. Fonner, V.A., Dalglish, S.L., Kennedy, C.E., Baggaley, R., O'Reilly, K.R., Koechlin, F.M. (2016). Effectiveness and safety of oral HIV preexposure prophylaxis for all populations. *AIDS* 30:1973–1983.
33. Gacau, K.K., Mugendi, G., Kiragu G, Ngayo, M.O., Omosa, G. (2024). Burden and predictors of anxiety disorder among HIV patients on art in Nairobi Kenya. *PLOS Ment Health* 1(2): e0000072.
34. Global Burden of Disease, (2021). Institute of Health Metrics and Evaluation.
35. Global HIV and AIDAS Statistics (2023) -Fact sheet Available at: <https://www.unaids.org/en/resources/fact-sheet>.
36. Gonzalez, J.S., Batchelder, A.W., Psaros, C., Safren, S.A. (2011). Depression and HIV/AIDS treatment non-adherence: a review and meta-analysis. *Acquired immune deficiency syndrome* 19992011; 58:181–187.
37. Gutkovich, Z., Rosenthal, R.N., Galynker, I., Muran, C., Batchelder, S., Itskhoki, E. (1999). Depression and demoralization among Russian Jewish immigrants in primary care. *Psychosomatics*. 1999 Mar-Apr; 40(2):117-25.
38. He, Q., Hao, C., Pan, D. (2023). Adherence to antiretroviral therapy and its predictive factors among people living with HIV in China: A behavioural theory-based prospective cohort study. *Int.J. Behav. Med.* 30, 555–565.
39. Himelhoch, S., Ehrenreich, M. (2007). Psychotherapy by primary-care providers: results of a national sample. *Psychosomatics* 48(4): 325–330.
40. Himelhoch, S., Medoff, D.R., Oyeniya, G. (2007) Efficacy of group psychotherapy to reduce depressive symptoms among HIV-infected individuals: a systematic review and meta-analysis. *AIDS Patient Care STDs* 21(10): 732–739.
41. Hinkin, C. H., Castellon, S. A., Atkinson, J. H., & Goodkin, K. (2001). Neuropsychiatric aspects of HIV infection among older adults. *J Clin Epidemiol*, 54 Suppl 1, S44.
42. Holodniy, M., Nguyen, N. (2008). HIV infection in the elderly. *clinical interventions in aging*. 2008 Sep; Volume 3
43. Institute of Health Metrics and Evaluation (2023). global health data exchange (GHDx). <https://vizhub.healthdata.org/gbd-results/> (Accessed 4 March 2023).
- a. *Journal of Dermatology*, 61(3), 261–264.
44. Krumme, A.A., Kaigamba, F., Binagwaho, A., Murray, M.B., Rich, M.L., Franke, M.F. (2015). Depression, adherence and attrition from care in HIV-infected adults receiving antiretroviral therapy. *J Epidemiol Community Health*; 69:284–289.
45. Linda, B., Da, Yunfeng, T.E., PhDa, Mabel, P.A., Ha, R. Luke, S, M (2020) medical monitoring project. division of HIV/AIDS prevention, centres for disease control and prevention, 1600 Clifton Rd. NE, MS-E46, Atlanta, GA, US
46. Mann, C. J. (2003). *Observational research methods: Research design II: Cross-*
47. McMahon, S.B., Koltzenberg, M., Wall and Melzack Textbook of pain. (Elsevier, New York, 2003)
48. Milanini, B., Catella, S., Perkovich, B., Esmaeili-Firidouni, P., Wendelken, L., Paul, R., Valcour, V. (2017). Psychiatric symptom burden in older people living with HIV with and without cognitive impairment: the UCSF HIV over 60 cohort study. *AIDS Care*, 1-8. doi:10.1080/09540121.2017.1281877
49. Motumma, A., Negesa, L., Hunduma, G. (2019). Prevalence and associated factors of common mental disorders among adult patients attending HIV follow up service in Harar town, eastern Ethiopia: a cross-sectional study. *BMC Psychol* 7, 11.
50. Mugavero, M.J., Lin H.Y., Willig, J.H., Westfall, A.O., Ulett, K.B., Routman, J.S. (2009) Missed visits and mortality among patients establishing initial outpatient HIV treatment. *Clin Infect Dis*; 48:248–256.
51. Mwangala, P.N., Wagner, R.G., Newton, C.R., Abubakar, A. (2023) Strategies for improving mental health and wellbeing used by adults ageing with HIV from the Kenyan coast: a qualitative exploration. *Welcome Open Res.* 2023 Jun 22; 7:221. doi: 10.12688/wellcomeopenres.18212.2. PMID: 37415804; PMCID: PMC10320323.

52. Nakimuli-Mpungu, E., Musisi, S., Smith, C.M., Von-Isenburg, M., Akimana, B., Shakarishvili, A.(2021). Mental health interventions for persons living with HIV in low- and middle-income countries: A Systematic Review. *Journal of the International AIDS Society*. Jun;24 (S2)
53. National Institute of Mental Health (2008). "What Is Generalized Anxiety Disorder?"
54. O'Brien, K.K., Ibáñez-Carrasco, F., Solomon, P. (2020). Research priorities for rehabilitation and aging with HIV: a framework from the Canada-International HIV and rehabilitation research collaborative (CIHRRC).
55. Pence, B.W., Mills, J.C., Bengtson, A.M., Gaynes, B.N., Breger, T.L., Cook, R.L. (2018). Association of increased chronicity of depression with HIV appointment attendance, treatment failure, and mortality among HIV-infected adults in the United States. *JAMA Psychiatry*; 75:379–385.
56. Pence, B.W., O'Donnell, J.K., Gaynes, B.N. (2012). The Depression treatment cascade in primary care: a public health perspective. *Curr Psychiatry Rep*; 14:328–335.
57. Rabkin, J.G. (2008). HIV and depression: review and update. *Current HIV/AIDS Rep*. 2008 Nov;5(4):163-71.
58. Rodger, A.J., Cambiano, V., Bruun, T., Vernazza, P., Collins, S., Van Lunzen, J. (2016). Sexual activity without condoms and risk of HIV transmission in Sero-different couples when the HIV-positive partner is using suppressive antiretroviral therapy. *JAMA*; 316:171–181
59. Sabin, C.A., & Reiss, P. (2017). Epidemiology of ageing with HIV: what can we learn from cohorts? *AIDS*;31 Suppl 2:S121–
60. Salik, I., Marwaha. R. (2022) *Electroconvulsive therapy*. StatPearls Publishing; Treasure Island (FL).
61. Satz, P., Myers, H. F., Maj, M., Fawzy, F., Forney, D. L., Bing, E. G., . . . Janssen, R. (1997). Depression, substance use, and sexual orientation as cofactors in HIV-1-infected men: cross-cultural comparisons. *NIDA Res Monogr*, 172, 130-155.
- a. *sectional, case-control, and cohort studies*. **Emergency Medicine Journal**,
62. Setia, M. S. (2016). *Methodology series module 3: Cross-sectional studies*. Indian
63. Shapiro, T., & Emde, R. N. (1991). Introduction: Some empirical approaches to psychoanalysis. *Journal of the American Psychoanalytic Association*, 39, 1-3
64. Smith Fawzi, M.C., Eustache, E., Oswald, C. (2012) Psychosocial support intervention for HIV-affected families in Haiti: implications for programs and policies for orphans and vulnerable children. *Soc Sci Med* 74(10): 1494–1503.
65. Steves, C.J., Spector, T.D., Jackson, S.H.(2012) Ageing, genes, environment and epigenetics: what twin studies tell us now, and in the future. *Age and ageing*. 2012 Sep;41(5) :581-6
66. Tan, T., Zhou, C., Lu, R., Chen, C., Bai, C., Li L., Wu, G. (20220).Depression and associated factors among men living with HIV/AIDS aged 50 years and over in Chongqing, China. *J Multidiscip Healthc*. 2022 Sep 9;15:2033-2040.
67. Terlizzi EP, Zablotsky B. (2019). Mental health treatment among adults: United States. NCHS Data Brief, no 380. Hyattsville, MD: National Center for Health Statistics. 2020
68. Trickey, A., Lei, Z., Caroline, A., C., Jonathan, A.C. (2022). Life expectancy of people with HIV on long term antiretroviral therapy in Europe and North America: A cohort study, University of Bristol.
69. UNAIDS. (2018) Global HIV & AIDS Statistics – 2018 fact sheet. Geneva, Switzerland: UNAIDS.
70. UNAIDS. (2025) Global HIV & AIDS Statistics – 2025 fact sheet. Geneva, Switzerland: UNAIDS.
71. United Nations (2019). World population ageing: Highlights, In ST/ESA/SER. A/430.
72. United Nations Programme on HIV/AIDS (2021). End Inequalities. End AIDS. Global AIDS Strategy 2021–2026. Geneva.
73. World Health Organization (2015). Mental health atlas. Geneva, Switzerland: WHO.
74. World Health Organization (2022). HIV Statistics 2022. Geneva, Switzerland: WHO.
75. World Health Organization (2025). HIV Statistics 2026. Geneva, Switzerland: WHO.
76. World Health Organization. (2014). Global health expenditure database. Geneva, Switzerland: WHO.
77. Xiaojie, H. (2018). The Double burdens of mental health among aids patients with fully successful immune restoration: a cross-sectional study of anxiety and depression in China
78. Yimer, S., Girma, Z., Mengistu, N., Shumye, S. (2021) Determinants of common mental disorders among people living with HIV/AIDS attending art service in southern Ethiopia. *HIV AIDS (Auckl)*. 2021 Sep 1

BIOGRAPHY

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