

Original Research Article

Prevalence and Severity of Depression Among Adults Living with HIV/AIDS Accessing Care at the ART Clinic of a Tertiary Health Facility in North-Central Nigeria

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Abstract

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Depression is a significant mental health concern globally. Among people living with HIV/AIDS (PLHIV), depressive symptoms are particularly prevalent, and this can impact the effective management of the disease. Nigeria ranks fourth in the global HIV/AIDS burden. Several factors have been associated with the development of depression among PLHIV. This study aimed to explore the prevalence of depression among PLHIV and its association with socio-demographic characteristics to enhance disease management and patient care. A hospital-based, cross-sectional study was conducted at the anti-retroviral therapy (ART) clinic of Bingham University Teaching Hospital (BHUTH), Jos Nigeria. Using a simple random sampling, adults living with HIV/AIDS receiving treatment at the ART clinic from September to December 2022 were recruited. The Patient Health Questionnaire-9 (PHQ-9) and a socio-demographic questionnaire were used. Data analysis was performed using SPSS version 26 and the level of significance was set at a p-value of 0.05. Five hundred and ninety-two (592) patients participated. There was a predominance of females (421, 71.1%). More than half (341, 57.6%) of participants were married. One hundred and ninety-four (32.8%) of them had attained a tertiary level of education. A 44.9% prevalence rate of depression was found. Participants with mild depression were 191 (32.2%), while 59 (10.0%) were moderately depressed, 12 (2.0%) had moderately severe depression, and 4 (0.7%) were severely depressed. There was a significant association between depression and the participants' age ($\chi^2 = 26.58$, $p = 0.04$), gender ($\chi^2 = 8.02$, $p = 0.03$), occupation ($\chi^2 = 24.04$, $p = 0.02$), and educational level ($\chi^2 = 28.79$, $p = 0.03$). This study highlights the significant prevalence of depression and its severity among adults living with HIV/AIDS and identifies some socio-demographic factors associated with depression. It is therefore crucial to adequately integrate mental health care into the management program of PLHIV to curtail the menace of depression.

Keywords: Adults living with HIV/AIDS, ART Clinic, Depression, Jos-Nigeria

INTRODUCTION

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), depression is a common and serious mood disorder that is characterized

by persistent feelings of sadness and hopelessness, and loss of interest in activities once enjoyed (The Diagnostic and Statistical Manual of Mental Disorders Fifth Edition,

DSM-V, 2023). It is associated with a disturbance in sleep and appetite. An estimated 5% of adults suffer from depression globally (The Diagnostic and Statistical Manual of Mental Disorders Fifth Edition, DSM-V, 2023). Human Immunodeficiency Virus (HIV) and acquired immunodeficiency syndrome (AIDS) has remained a global public health issue (World Health Organization, 2023; Du et al., 2023). The World Health Organization (WHO) ranked HIV/AIDS as the second in the top 10 causes of disease-related life loss among adults in 2019 (Du et al., 2023; Abbafati et al., 2019). In 2021, the WHO also reported that 38.4 million people were living with HIV, with about 1.5 million new infections and 650 thousand deaths due to HIV-related causes (World Health Organization, WHO. Global progress report on HIV, viral hepatitis, and sexually transmitted infections, 2023). Nigeria is ranked with the second highest HIV/AIDS burden in Africa, after South Africa (Aika and Odili, 2019).

The psychosocial effects of HIV infection can lead to various mental disorders if not managed effectively (World Health Organization and UNAIDS, 2023). Among people living with HIV/AIDS (PLHIV), depressive symptoms have emerged as a common comorbidity with a prevalence of 20% – 40% (Du et al., 2023; Pence et al., 2018). Depression in PLHIV is about 2 – 3 times higher than in those without HIV (Du et al., 2023; Adeoti et al., 2018). In sub-Saharan Africa, studies have reported a higher prevalence rate of depression among PLHIV ranging between 29% and 63% (Adeoti et al., 2018). In addition, PLHIV are prone to social discrimination, stigma, lack of social support, low self-esteem, and loneliness (Du et al., 2023). Although mental illnesses like depression can complicate HIV infection, studies have also shown that the prevalence of HIV among mentally ill individuals is higher than in the general population (Obadeji et al., 2014). Also, individuals with mental disorders are more vulnerable to infection with HIV probably due to a higher prevalence of poverty, social isolation, and high risk of sexual abuse.

The extensive use of antiretroviral therapy (ART) has increased the percentage of PLHIV that have a life span comparable to those not infected (World Health Organization, 2023; Du et al., 2023; Wang et al., 2018). However, the psychological impact of realizing that one has a positive HIV diagnosis, coupled with the neurobiological effects of the virus, and the side-effects of ART, may contribute to the development of depression in PLHIV (Wang et al., 2018). Several other factors have been identified as being associated with the development of depression among PLHIV, such as the stage of the HIV disease, comorbid opportunistic infections, disease-associated stigma, low educational status, low socioeconomic status, unemployment, being unmarried, and having poor social support (Adeoti et al., 2018; Wang et al., 2018). Depression affects an individual's health

outcome. For PLHIV, depression may influence accessibility to ART, adherence to ART, and ultimately increase the mortality rate of PLHIV (Pence et al., 2018; Olagunju et al., 2012). It is important to recognize that poor medication adherence can further exacerbate the consequences of depression, leading to immunological failure, and an increased risk of HIV transmission.

However, a distressing reality remains that depression is seldom clinically recognized in PLHIV (Olisah et al., 2011). Depression is common among PLHIV but is largely under-recognized and undertreated (Van-Copenhagen and Duvenage, 2019). This is a growing concern with public health issues. Consequently, our study aimed to investigate the prevalence of depression among adults living with HIV/AIDS accessing care at a tertiary health facility in Jos, Northcentral, Nigeria, and to explore the association between their sociodemographic characteristics and the severity of depression. By highlighting these important aspects, this research endeavors to contribute to the improvement of HIV/AIDS management and ultimately enhance the overall well-being of PLHIV.

METHODOLOGY

Study Area

This study was conducted among patients receiving care at the ART clinic of Bingham University Teaching Hospital (BHUTH), Jos Plateau State, North-central Nigeria. It is a tertiary health facility that provides care to people in the state and the surrounding communities.

Study Design

It was a hospital-based, cross-sectional study conducted among patients receiving care at the ART clinic of Bingham University Teaching Hospital, a tertiary health institution on the Plateau, North Central Nigeria. The study was carried out from September 2022 to December 2022.

Study Population

The study population comprised about 4,500 adult patients living with HIV/AIDS of 18 years and above who were accessing care at the ART clinic at the Bingham University Teaching Hospital, Jos.

Inclusion and exclusion criteria

Adults living with HIV/AIDS who had been on follow-up

and have been on treatment for at least 6 months were eligible to participate in this study. It has been noted that the first 6 months of HIV diagnosis and initiation of ART are critical, which may adversely affect a patient's state of health (Siniscalchi et al., 2020; Ayisi-Boateng et al., 2022; Deshmukh et al., 2017). All adult patients living with HIV/AIDS accessing care at the clinic who consented to the study were included. Patients who were critically ill and pregnant women were excluded from the study.

Sample Size Determinization and sampling procedure

The Leslie-Kish formula for cross-sectional studies was used to calculate the sample size, $n = Z^2 p (1-p) / d^2$ (Creative Research Systems. Sample size formulas, 2012). In this formula, n was the minimum sample size, Z was 1.96 at a confidence level of 95%, p was taken to be 50% prevalence, and d was the degree of accuracy desired which was set at 0.05. From a population of about 4,500 patients accessing care at the ART clinic, using a 50% prevalence rate and 95% confidence level, a minimum sample size of 384 was obtained. To account for incompletely filled questionnaires and to increase the power of the study, the sample size was increased to 600. Five hundred and ninety-two (592) participants completed the questionnaire giving a response rate of 98.7%. Simple random sampling was employed to recruit the study participants. Patients who visited the ART clinic during the study period were interviewed and eligible patients were recruited.

Study tools

A modified structured questionnaire with questions on the participants' socio-demographic characteristics was administered. The PHQ-9 questionnaire tool was utilized in screening for the presence of depression (Manea et al., 2012; Kroenke et al., 2001). It is a reliable and validated screening tool for depression. It is a nine-item depression screening tool, widely acknowledged for its association with the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) criteria (Manea et al., 2012). This nine-item depression screening tool captures the frequency of specific depressive symptoms over the past two weeks. Responses to each item were scored on a scale from 0 to 3, resulting in a total score ranging from 0 to 27. Higher scores indicated greater depression severity. A PHQ-9 score less than 5 was indicative of absent or minimal depression, and not requiring treatment (Manea et al., 2012). Scores between the range of 5 to 9 represented mild depression, 10 to 14 were associated with moderate depression, while scores between 15 and 19 denoted moderately severe depression. Severe depression was defined by PHQ-9

scores of 20 to 27 (Manea et al., 2012).

The PHQ9 questionnaire was combined with a socio-demographic and socioeconomic questionnaire administered as an interviewer-administered questionnaire.

Data processing and analysis

The data obtained were analyzed using IBM SPSS Statistics for Windows, version 26 (IBM Corp., Armonk, N.Y., USA). The distribution of the variables was presented in frequencies and percentages. Chi-square was done to test the relationship between the study participants' sociodemographic characteristics and the presence of depression. The level of significance was set at a p -value of 0.05.

Ethical consideration

Ethical approval to conduct this study was obtained from the Health and Research Ethics Committee (HREC) of Bingham University Teaching Hospital, Jos. The nature and purpose of the study were explained to the participants before recruitment into the study. Participants were also informed that they could withdraw from the study at any point without any repercussions. Informed written consent was obtained from the participants.

RESULTS

Socio-demographic characteristics of the study participants

Five hundred and ninety-two (592) patients participated in this study. The majority (221, 37.3%) of the participants were between the ages of 36 and 45 years, and the least (24, 4.1%) were in the age group ≥ 66 years. This study had more females (421, 71.1%) than males. More than half (341, 57.6%) of participants reported being married and 20.1% were widowed, while the others were either single or divorced. However, 5 (0.8%) of the participants declined to report their marital status. Most of the participants were employed; the majority of whom were self-employed (303, 51.2%) and formally employed (167, 28.2%) either by the government or private establishment. Although a high percentage of the participants were employed, only 33 (5.6%) were earning between N101,000-N200,000 which is equivalent to \$135 – \$266 monthly. A high percentage (339, 57.3%) were however earning less than or equal to N50,000, an equivalent to \$67 monthly. The percentage of participants with tertiary and secondary education was within the same range, 32.8%, and 31.4% respectively. This is shown in Table 1.

Table 1. Distribution of the socio-demographic characteristics of the study participants

Characteristic		Frequency	Percent
Age	18 – 35	96	16.2
	36 – 45	221	37.3
	46 – 55	159	26.9
	56 – 65	92	15.5
	≥ 66	24	4.1
	Total	592	100
Gender	Male	171	28.9
	Female	421	71.1
	Total	592	100
Marital status	Single	91	15.4
	Married	341	57.6
	Widowed	119	20.1
	Divorced	36	6.1
	No response	5	0.8
	Total	592	100
Occupation	Formally employed	167	28.2
	Self-employed	303	51.2
	Unemployed	47	7.9
	Retired	71	12
	No response	4	0.7
	Total	592	100
Monthly income (N)	≤ 50,000	339	57.3
	51,000 - 100,000	74	12.5
	101,000 – 200,000	33	5.6
	≥ 201,000	126	21.3
	No response	20	3.4
	Total	592	100
Educational level	Informal	19	3.2
	Primary	141	23.8
	Secondary	186	31.4
	Tertiary	194	32.8
	None	49	8.3
	No response	3	0.5
	Total	592	100

N = Naira

Prevalence and severity of depression among the study participants

This study recorded a prevalence rate of 44.9% (266 study participants) of depression. Those who had mild depression were 191 (32.2%) and 59 (10.0%) were moderately depressed. In addition, 12 (2.0%) had moderately severe depression and 4 (0.7%) were severely depressed. This is depicted in Figure 1.

Association between the sociodemographic characteristics of the study participants and the severity of depression

From this study, the participant's age ($\chi^2 = 26.58$, $p = 0.04$), gender ($\chi^2 = 8.02$, $p = 0.03$), occupation ($\chi^2 = 24.04$, $p = 0.02$), and educational level ($\chi^2 = 28.79$, $p = 0.03$) were found to be significantly associated with the development of depression. Though 44.0% of the

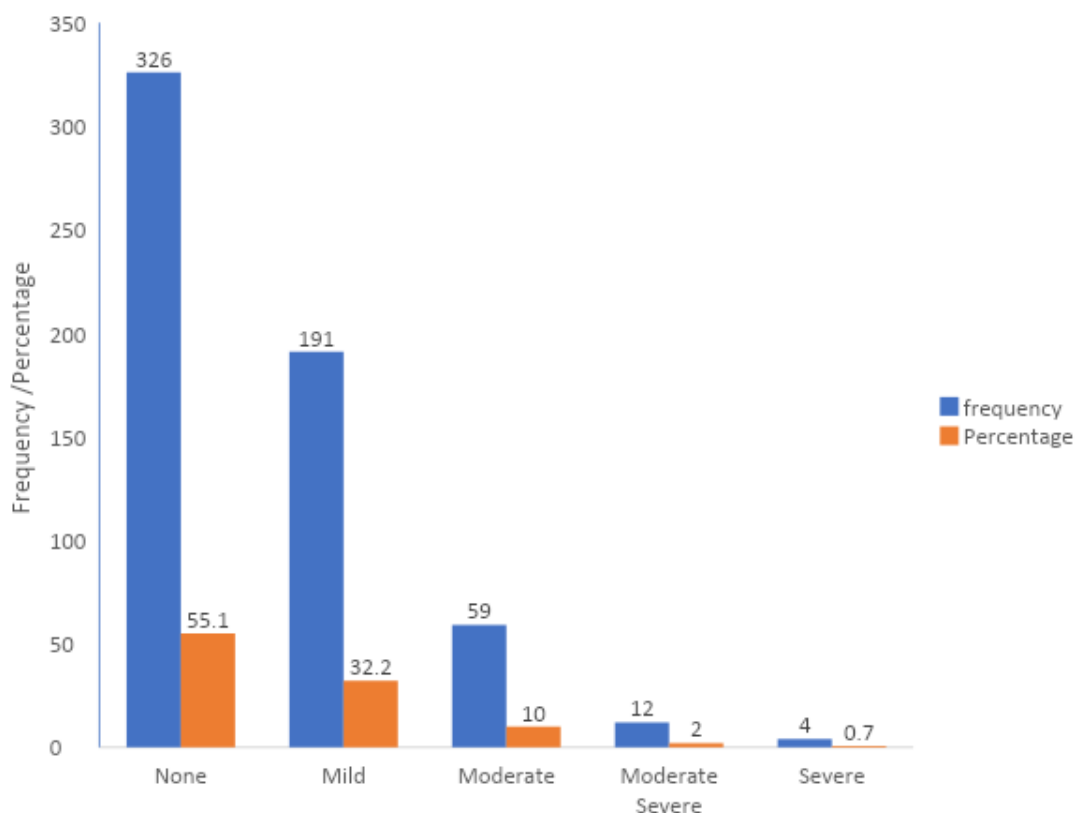


Figure 1. Bar chart showing the prevalence of depression among the study participants.

Table 2. Association between the socio-demographic characteristics of the study participants and the severity of depression

Socio-demographic characteristics	Severity of Depression					Chi-square	p-value
	No Depression	Mild	Moderate	Moderately Severe	Severe		
Age						26.578	0.044*
18-35	51	35	6	4	0		
36-45	116	70	31	1	3		
46-55	101	43	11	4	0		
56-65	48	33	9	2	0		
≥66	10	10	2	1	1		
Gender						8.016	0.031*
Male	106	51	9	4	1		
Female	220	140	50	8	3		
Marital status						12.883	0.378
Single	51	31	6	2	1		
Married	200	101	33	5	2		
Widowed	57	42	14	5	1		
Divorced	15	15	6	0	0		
Occupation						24.036	0.020*
Formally employed	107	52	7	1	0		
Self-employed	153	96	42	9	3		
Unemployed	29	14	4	0	0		
Retired	36	28	4	2	1		
Monthly income						19.364	0.080
≤ 50,000	176	113	39	8	3		
51,000 -100,000	51	20	3	0	0		
101,000 – 200,000	25	5	3	0	0		
≥ 201,000	53	48	10	4	1		

Table 2. Continue

Educational status						28.789	0.025*
Informal	14	4	1	0	0		
Primary	66	53	16	6	0		
Secondary	98	60	25	2	1		
Tertiary	123	54	14	1	2		
None	23	19	3	3	1		

* = significant p-value

participants who were single and 41.4% who were married had a form of depression, marital status was not statistically significant ($\chi^2 = 12.88$, $p = 0.38$) with depression. This association is shown in Table 2.

DISCUSSION

From this study, the overall prevalence of depression was 44.9%. This high prevalence suggests that depression is common among adults living with HIV/AIDS. This aligns with the findings from other low and middle-income countries (LMICs) in the Asia-Pacific regions (Ross et al., 2022). A study conducted in India by Deshmukh et al. reported a prevalence of 50.0% of depression among adults living with HIV/AIDS (Deshmukh et al., 2017). Another study by Liu et al in China also reported a rate of 40.9% of depression (Liu et al., 2018). A systematic review and meta-analysis conducted by Lofgren et al reported a significantly high burden of depression in Africans with HIV/AIDS (Lofgren et al., 2020). This was reflected in this study. A study conducted in South Africa reported a rate of 53.8% depression among adults living with HIV/AIDS (Van-Copenhagen and Duvenage, 2019). Another study from Sudan reported an even higher rate of 63.1% of depression among them (Elbadawi and Mirghani, 2017). Other African countries such as Tanzania and Ethiopia have reported a prevalence rate of depression in adults living with HIV/AIDS between the range of 30% and 40% (Madundo et al., 2023; Tiwari et al., 2017; Dorsisa et al., 2020; Girma et al., 2021; Yousuf et al., 2020). In a neighboring country, Cameroon, a study by Kanmogne et al found a prevalence of 33.7% of depression while Ayisi-Boateng et al from their study conducted in Ghana reported a depression rate of 53.4% (Ayisi-Boateng et al., 2022; Kanmogne et al., 2017).

Similar studies in Nigeria have reported high prevalence rates. Shittu et al from their study conducted in another North-central part of Nigeria found a 56.7% prevalence rate of depression among adults living with HIV/AIDS (Shittu et al., 2014). Their study, however, was done in a Secondary Health facility about 10 years before this study. A study conducted in Abuja; North-central Nigeria reported a lower prevalence rate of 23.2% (Egbe et al., 2017). An even lower rate of 14.2% was reported

by Olisah et al in a study done in Northwest Nigeria (Olishah et al., 2011). These lower rates may be due to the variance in the study tools used for depression screening and the location. The other study used the Center for Epidemiologic Studies Depression Scale (CES-D) to screen for depression (Olishah et al., 2011). However, a study conducted in South-Eastern Nigeria, that used the same screening tool (PHQ-9) as this study, reported a prevalence rate of 33.3% (Onyebuchi-Iwudibia and Brown, 2013). Some studies from Southwest Nigeria found prevalence rates between 23% and 40% (Adeoti et al., 2018; Obadeji et al., 2014; Amoko et al., 2016). Another study in South-south Nigeria reported a prevalence of 24.6% of depression (Aika and Odili, 2019). In addition to the different screening tools for depression used in the different studies that may explain the variance in the prevalence rate of depression, another possible reason is the difference in sociocultural and ethno-religious variations that exist between the North and South of Nigeria.

This study found a prevalence of 32.2% with mild depression, 10.0% had moderate depression, 2.0% with moderately severe depression, and 0.7% were severely depressed. Similar findings were reported by Ross et al in a study among several Asian-Pacific countries; it reported 29%, 12%, 5%, and 2% for mild, moderate, moderately severe, and severe depression respectively among PLHIV (Ross et al., 2022). However, it is worth noting that the prevalence of severe depression in this study was relatively lower, which could reflect the effective care and support provided by a tertiary health facility.

There was a significant association between depression and the socio-demographic factors of age, gender, occupation, and educational status in this study. From this study, a significant proportion of young adults in the age group of 36 – 45 years were depressed. Also, a significant proportion of females were depressed compared to their male counterparts. Similar findings were reported by studies conducted in other African countries (Elbadawi and Mirghani, 2017; Madundo et al., 2023; Dorsisa et al., 2020; Girma et al., 2021; Kanmogne et al., 2017). Studies done in several parts of Nigeria also reported a significantly increased risk of depression among females compared to males (Adeoti et al., 2018;

Obadeji et al., 2014; Shittu et al., 2014). The higher prevalence of depression reported among females may be multifactorial with a combination of biological, psychological, and socio-cultural factors.

From this study, a higher proportion of widowed (52.1%) and divorced (58.3%) were depressed, however, this was not statistically significant. Similarly, Adeoti et al from their study done in Southwest Nigeria found a significant association between being either divorced or widowed and having depression among adults living with HIV/AIDS (Adeoti et al., 2018). A study by Yousuf et al conducted in Ethiopia reported a significantly higher risk of having depression among PLHIV who were divorced (Yousuf et al., 2020). Some other studies conducted both in other African countries and within Nigeria also reported a significant association between being single and the development of depression (Ayisi-Boateng et al., 2022; Shittu et al., 2014; Amoko et al., 2016). On the contrary, a study in Sudan reported that depression was significantly associated with married individuals living with HIV/AIDS (Elbadawi and Mirghani, 2017). These findings may be due to the complex interplay between marital status and the psychosocial well-being of an individual, coupled with the psychological impact of living with HIV/AIDS.

The educational level, occupation, and monthly income of an individual can be said to be intertwined. In this study, there was a significant association between depression and the educational level with the occupation of the participants. Similar findings of depression being significantly associated with a low educational level, low socioeconomic status, illiteracy, and unemployment have been reported from studies conducted in other regions of Nigeria (Adeoti et al., 2018; Shittu et al., 2014; Amoko et al., 2016). Individuals with low educational levels and unemployment were reported as significantly associated with depression from studies conducted in India, Ethiopia, and Cameroon (Deshmukh et al., 2017; Yousuf et al., 2020; Kanmogne et al., 2017). These findings further emphasize the role education and income play in the mental health of an individual. A higher educational level often reflects better health literacy, empowerment, and healthy coping strategies, which may be protective factors against the development of depression. In addition, socioeconomic disparities can impact an individual's access to healthcare services, adherence to medication, social support, and overall quality of life, which may ultimately influence the risk of developing depression among adults living with HIV/AIDS.

CONCLUSION

This study has highlighted the high prevalence of depression among adults living with HIV/AIDS. It has also identified age, gender, educational level, and occupation as the sociodemographic factors associated with

depression. Findings from this study have reflected the importance of evaluating depression in PLHIV. It is therefore crucial to advocate for the adequate integration of mental health care into the management program of PLHIV to curtail the menace of depression among them.

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