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Depression and its associated factors among people living with HIV/AIDS attending the HIV/AIDS CLINIC in southwest Nigeria

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A – Study Design, B – Data Collection, C – Statistical Analysis, D – Data Interpretation, E – Manuscript Preparation, F – Literature Search, G – Funds Collection

Summary **Background.** Mental health disorders have received little attention amongst people living with HIV/AIDS (PLWHA). Depression is the most common psychiatric consequence of HIV/AIDS diagnosis. Its prevalence is higher among PLWHA than the general population.
Objectives. To determine the prevalence of depression, to identify its associated factors and, lastly, to determine its association with treatment outcome measures among PLWHA on antiretroviral therapy (ART) aged ≥ 18 years receiving care at the HIV clinic of General Hospital, Lagos.
Material and methods. A cross-sectional study was conducted using the systematic random sampling method to select participants over a period of 14 weeks. An interviewer-administered questionnaire was designed to capture socio-demographic, behavioural, psychosocial, HIV and health-related information, as well as the clinical data of the participants. The Patient Health Questionnaire (PHQ-9) was used to assess depression. The relationships between depression and other participants' characteristics were tested with Pearson's chi-squared (χ^2) test. Logistic regression analysis was used to minimise confounding, and the level of statistical significance was set as a p-value of ≤ 0.05.
Results. The total of 279 respondents, with a mean age of 43.1 ± 10.3 years, were predominantly females (67.7%). The prevalence of depression among the participants was 24%. Factors such as occupation ($p = 0.041$; 95% CI, 0.43 to 3.63), alcohol intake ($p = 0.036$; 95% CI, 0.62 to 3.82), cohabitation ($p = 0.025$; 95% CI, 1.43 to 3.82), stigmatisation ($p = 0.008$; 95% CI, 0.92 to 3.70) and personal history of depression ($p < 0.001$; 95% CI: 1.75 to 6.38) showed statistically significant relationships with depression.
Conclusions. The burden of depression is high among PLWHA. Identifying and unravelling factors associated with depression among PLWHA and advocacy against stigmatisation will play a significant role in reducing this burden.
Key words: depression, mental health, HIV, Acquired Immune Deficiency Syndrome, treatment outcome.

Background

Mental illness is one of the co-morbidities that are often overlooked in treating patients with Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) [1]. Depression and HIV/AIDS are projected to become the world's two leading causes of disability by 2030 [2]. Globally, depression affects more than 300 million people, and this accounts for 121 million People Living with HIV/AIDS (PLWHA) [3]. The average prevalence of depression in low and middle-income countries and sub-Saharan Africa is about 10–20% [4]. In Nigeria, depression is five times more common in people living with HIV/AIDS than an apparently healthy population [5].

Depression is second to substance abuse as the most prevalent psychiatric disorder among HIV positive patients [6]. Despite its high prevalence, it is commonly under-diagnosed and consequently untreated [7].

There is widespread stigmatisation against mental illness in Nigerian communities [8]. This is doubld for PLWHA, as the stigma has also been shown to be associated with HIV/AIDS [9]. Depression silently destroys families and ruins the careers of affected individuals [10]. It adds to the burden of the disease experienced by patients with HIV and increases the risk of morbidity and mortality [11]. Several factors such as social stigma, occupational disability, poor social support, long term physical discomfort and illness have also been attributed to the increasing rate of depression among PLWHA [12].

Sub-Saharan Africa remains the centre of the HIV/AIDS epidemic [13]. However, as life expectancy increases for people living with HIV in this region, more attention is being paid to the impact of co-morbid non-communicable disorders. Much has been written about the importance of certain NCDs in PLWHA, but little attention has been given to the significant mental health burden [14].

There is increasing evidence that depression negatively impacts the course of HIV/AIDS [14]. Although studies done in these areas have identified factors associated with depression, only a few have considered the impact of depression on the treatment outcome measure (CD4 count) of these patients in Nigeria [15, 16]. Thus, this study extends knowledge by addressing the question of whether depression is associated with socio-demographic, behavioural, psychosocial or health-related factors among PLWHA in the study setting.

Material and methods

Study design

A descriptive cross-sectional study was conducted at the HIV clinic of the premier general hospital in Nigeria.

Study setting

General Hospital, Lagos is a 225-bed hospital that provides primary and secondary health care services.

The HIV/AIDS clinic had a total of 7,420 patients registered at the clinic; however, only 3,953 of them remained enrolled for Anti-Retroviral Therapy (ART) at the facility. From the clinic register, it was observed that 3,632 patients had been on ART for at least six months. The average daily attendance of patients on ART for at least six months was 61.

Study population

The study population was made up of HIV-positive clients aged 18 years and above receiving care at the HIV clinic in General Hospital, Lagos.

Sample size estimation

The minimum sample size of 279 was determined from the formula developed by Cochran [17] to yield a representative sample for categorical data. The correction formula was further applied for the study population which, was < 10,000. At a 95% confidence level, desired precision of 5% and a prevalence value of 23% for depression among PLWHA from a previous study done in southwest Nigeria, a minimum sample size of 279 was derived.

Selection criteria

Participants were consenting HIV-positive clients aged 18 years and above who had been on ART for at least six months. Patients who were acutely ill or debilitated and those with chronic physical/mental conditions such as diabetes, hypertension or other psychiatric disorders (such as schizophrenia, bipolar affective disorders, etc.) were excluded.

Sampling technique

The minimum sample size of 279 was achieved through a systematic sampling technique to select the participants from the potential respondents who met the inclusion criteria. The sampling interval (13) was determined as the ratio of the average estimated population size over a 14-week study period (3,632) and the minimum sample size (279) [18]. The first participant was selected by simple random sampling (ballot method). Others were sequentially selected based on the sampling interval (13).

Materials

A seven-part questionnaire was designed to capture data regarding socio-demographic characteristics, behavioural variables, HIV and health-related information, as well as clinical measurements. A validated tool, the Patient Health Questionnaire (PHQ-9), was included in the interviewer-administered questionnaire. Patient Health Questionnaire scores are interpreted as follows: 5–9, 10–14, 15–19 and 20–27, which represent cut-off points for mild, moderate, moderately severe and severe depression, respectively [19].

Data analysis

The data obtained was recorded into a computer and analysed using Statistical Package for Social Sciences (SPSS) version 21 (IBM SPSS Statistics by IBM). The prevalence rates of the categories of depression based on severity was calculated and presented in a frequency table. The relationships between factors associated with depression, such as the socio-demographic, behavioural, psychosocial variables, as well as CD4 count, were determined using the Pearson's chi-squared (χ^2) test. Binary logistic regression analysis was used to analyse factors that showed a statistically significant relationship with depression. Fisher's exact test was applied for bivariate analysis where the cell count was less than 5. The level of statistical significance was set as a p-value of equal or less than 0.05.

Ethical consideration

Ethical approval to conduct the study was granted by the hospital's ethics review committee.

The purpose of the study was explained to the participants and written informed consent was obtained before administration of the questionnaire. The privacy and confidentiality of respondents and anonymity were ensured. There were no anticipated risks to participants. Participants who screened positive for depression were referred for further psychiatric evaluation and treatment.

Results

A total of 279 participants with a mean age of 43.1 ± 10.3 participated in the study. The majority (53.4%) were young adults (< 45 years of age). Of the participants, more than two-thirds (66.7%) were females, more than half (59.9%) were married, and most (74.9%) were from monogamous family settings. Nearly half of the participants had secondary education (43.7%), most (72%) lived above the poverty line, and 70.2% were employed.

Almost a quarter of the participants were depressed (prevalence rate = 24% (CI: 65.8–68.2)).

The relationships between the socio-demographic characteristics of the participants and the presence of depression are shown in Table 1, while Table 2 depicts the relationships between the behavioural/psychosocial characteristics of the participants and depression. There was a statistically significant relationship between depression and the following: occupation (p = 0.016), alcohol intake (p = 0.012), cohabitation (p = 0.007), stigmatisation (p = 0.003), having a family member with HIV (p = 0.047) and personal history of depression (p = 0.001).

Table 1. Relationship between the socio-demographic characteristics of the participants and depression

Variable	Presence of depression		χ^2	p
	No n = 212 (%)	Yes n = 67 (%)		

Age in years
  young adults
  (< 45)
  middle-aged
  adults (45–60)
  elderly (60+)
	107 (50.5)
	97 (45.7)
	8 (3.8)
		42 (62.7)
		24 (35.8)
		1 (1.5)
				0.192*

Gender
  male
  female
	63 (29.7)
	149 (70.3)
		27 (40.3)
		40 (59.7)
			2.608	0.106

Marital status
  single
  married
  divorced
  separated
  widowed
	31 (14.6)
	129 (60.9)
	3 (1.4)
	24 (11.3)
	25 (11.8)
		14 (20.9)
		38 (56.7)
		2 (3.0)
		6 (8.9)
		7 (10.5)
				0.657*

Family setting
  monogamy
  polygamy
	157 (74.1)
	55 (25.9)
		52 (77.6)
		15 (22.4)
			0.342	0.558

Religion
  Christianity
  Islam
  traditional
	146 (68.9)
	64 (30.2)
	2 (0.9)
		48 (71.6)
		19 (28.4)
		0 (0.0)
				0.930*

Ethnicity
  Yoruba
  Igbo
  Hausa
  others
	123 (58.0)
	48 (22.6)
	11 (5.2)
	30 (14.1)
		33 (49.3)
		19 (28.4)
		5 (7.4)
		10 (14.9)
			1.872	0.599

Table 1. Relationship between the socio-demographic characteristics of the participants and depression

| Variable | Presence of depression | | | |
	No n = 212 (%)	Yes n = 67 (%)	χ^2	p
Domicile				0.364*
within Lagos	208 (98.1)	64 (95.5)		
outside Lagos	4 (1.9)	3 (4.5)		
Education			2.507	0.474
none	20 (9.4)	7 (10.5)		
primary	43 (20.3)	10 (14.9)		
secondary	95 (44.8)	27 (40.3)		
tertiary	54 (25.5)	23 (34.3)		
Occupation				**0.016***
professional	39 (18.4)	8 (11.9)		
civil servant	12 (5.7)	2 (3.0)		
artisan	56 (26.4)	15 (22.4)		
unemployed	67 (31.6)	16 (23.9)		
farmer	25 (11.8)	21 (31.3)		
others	13 (6.1)	5 (7.5)		
Income			0.858	0.354
below poverty line (< 19,500 Naira)	44(30.3)	12 (23.5)		
above poverty line (> 19,500 Naira)	101 (69.7)	39 (76.5)		
Family member with HIV			3.936	**0.047**
yes	34 (16.0)	18 (26.9)		
no	178 (84.0)	49 (73.1)		
Personal history of depression			19.97	**< 0.001**
yes	68 (32.1)	42 (62.7)		
no	144 (67.9)	25 (37.3)		
Family history of depression				0.303*
yes	7 (3.3)	4 (6.0)		
no	205 (96.7)	63 (94.0)		

* Fisher's exact test applied.

Table 2. Relationships between the behavioural and psychosocial characteristics of the participants and depression

| Variable | Presence of depression | | | |
	No n = 212 (%)	Yes n = 67 (%)	χ^2	p
Smoking				0.341*
yes	6 (2.8)	0 (0.0)		
no	206 (97.2)	67 (100.0)		
Alcohol			6.249	**0.012**
yes	20 (9.4)	14 (20.9)		
no	192 (90.6)	53 (79.1)		
Other substance				0.437*
yes	3 (1.4)	0 (0.0)		
no	209 (98.6)	67 (100.0)		
Engaged in sexual activities			0.306	0.580
yes	141 (66.5)	47 (70.2)		
no	71 (33.5)	20 (29.8)		
Always use condoms?			4.462	0.107
always	82 (58.6)	24 (50.0)		
never	13 (9.3)	10 (20.8)		
sometimes	45 (32.1)	14 (29.2)		
Co-habitation			7.342	**0.007**
alone	25 (11.8)	17 (25.4)		
with others	187 (88.2)	50 (74.6)		
Disclosed status?			0.063	0.801
yes	186 (87.7)	58 (86.6)		
no	26 (12.3)	9 (13.4)		
If yes, to who?				0.740*
partner	64 (34.4)	18 (31.0)		
family	113 (60.8)	36 (62.1)		
friends	9 (4.8)	4 (6.9)		
Feel stigmatised?			8.546	**0.003**
yes	42 (19.8)	25 (37.3)		
no	170 (80.2)	42 (62.7)		

* Fisher's exact test applied.

As shown in Table 3, there was no statistically significant relationship between depression and the HIV/Health-related characteristics of depression.

Table 3. Relationships between the HIV and health-related characteristics of the participants and the presence of depression

| Variable | Presence of depression | | | |
	No n = 212 (%)	Yes n = 67 (%)	χ^2	p
How long are you aware of your status?			2.282	0.516
< 1 year	13 (6.2)	6 (9.0)		
1–5 years	77 (36.3)	26 (38.8)		
6–10 years	70 (33.0)	24 (35.8)		
> 10 years	52 (24.5)	11 (16.4)		
Mode of infection				0.345*
sex with the same sex partner	23 (10.9)	7 (10.5)		
sex with opposite sex partner	46 (21.7)	22 (32.8)		
injecting drugs	1 (0.5)	0 (0.0)		
blood products	32 (15.0)	11 (16.4)		
don't know	110 (51.9)	27 (40.3)		
Change in ART regimen in the last 3–6 months			0.065	0.798
yes	29 (13.7)	10 (14.9)		
no	183 (86.3)	57 (85.1)		
How would you rate your health?				0.313*
very poor	3 (1.4)	0 (0.0)		
poor	3 (1.4)	4 (5.9)		
Neither good nor poor	14 (6.6)	5 (7.5)		
good	150 (70.8)	46 (68.7)		
very good	42 (19.8)	12 (17.9)		
Duration on ARV			2.800	0.424
< 1 year	20 (9.4)	7 (10.5)		
1–5 years	80 (37.8)	32 (47.7)		
6–10 years	66 (31.1)	18 (26.9)		
> 10 years	46 (21.7)	10 (14.9)		
Adverse effect on ARV			2.119	0.145
yes	45 (21.2)	20 (29.9)		
no	167 (78.8)	47 (70.1)		

* Fisher's exact test applied.

Table 4 shows the majority (73.1%) had CD4 count > 350, and 11.8% had CD4 count < 200. The difference in the distribution of depression across the categories of CD4 count was not statistically significant.

Table 5 revealed that the farmers and the unemployed were 4 times and 1.26 times more likely to be depressed compared to

the professionals. The odds of depression were 3.5 times higher in participants with a personal history of depression than those without. The participants who lived alone were 3 times more at risk of depression than those who lived with others. Stigmatisation almost doubled the odds of depression (1.95), while alcohol users were 1.54 times more likely to be depressed than non-users.

Table 4. Relationship between treatment outcome measure (CD4 count) among the participants and depression

	Presence of depression			
Variable	No $n = 212$	Yes $n = 67$	χ^2	p
CD4 Count				
< 200/μl	22 (10.4)	11 (16.4)	2.717	0.257
200–350/μl	30 (14.1)	12 (17.9)		
> 350/μl	160 (75.5)	44 (65.7)		

Table 5. Binary logistic regression of factors that showed a significant relationship with depression

	Presence of depression (Yes)		95% CI		
Variable		OR	Lower	Upper	p
Alcohol	yes no	1.54 1.0 (R.C)	0.62	3.82	**0.036**
Occupation	professional civil servant artisans unemployed farmer others	1.0 (R.C) 1.10 1.40 1.26 4.01 3.59	0.16 0.47 0.43 1.37 0.83	5.85 4.01 3.63 11.78 15.4	0.987 0.054 **0.041** **0.011** 0.085
Cohabitation	alone with others	3.21 1.0 (R.C)	1.43	7.60	**0.025**
Stigmatisa-tion	yes no	1.95 1.0 (R.C)	0.92	3.70	**0.008**
Personal history of depression	yes no	3.50 1.0 (R.C)	1.75	6.38	**< 0.001**
Family member with HIV	yes no	2.10 1.0 (R.C)	0.97	4.53	0.057

Discussion

The findings from this study suggest a marked burden of depression (24%), which was significantly associated with alcohol intake, stigmatisation, cohabitation, occupational types and personal history of depression amongst PLWHA in the study setting. The depression prevalence of 24% in this study was similar to the rates reported in previous studies in Nigeria [9, 12, 20, 21], as well as within the range of 20% to 30% reported in some African countries [11, 22] and 20% reported in Australia [23]. However, a higher prevalence of 39.1% and 57% was observed in similar studies in southeast and north central Nigeria, respectively [13, 24]. The differences in prevalence rates may be a reflection of the geographical variations in the epidemiology of diseases in Nigeria. A meta-analysis in Ethiopia reported a higher prevalence of 36.6% [25]. The author reported that this finding was similar to other low-income countries [25]. The high prevalence of depression may also be explained by the challenges of coping with the diagnosis, disease symptoms, bereavement, relationship crises, social rejection, co-existing poverty and the side effects of certain antiretroviral medications [26].

Farmers were 4 times more likely to be depressed compared to professionals (such as teachers, lawyers, bankers). 80% of the farmers in this study lived below the poverty line; therefore, their higher odds of being depressed may be connected to their economic situation. Unemployed participants were 1.26 times more likely to be depressed compared to professionals. This might be because a medium or high socioeconomic status promotes access to the required health services and information among professionals. Likewise, a cross-sectional study in South Africa reported that unemployment could cause mental and physical hardships [27]. In contrast to the findings in this study, PLWHA who were employed were twice as likely to be depressed compared with their unemployed counterpart in a study carried out in Benin city, Nigeria [5]. Furthermore, unemployment may correlate with poorer quality of life outcomes, which are related to poor psychological adjustment. Discrimination by employers was reported to affect the disclosure of status by affected individuals, which affects the effectiveness and attention they pay to receiving optimal care [21].

Alcohol intake, cohabitation, experience of stigma and a personal history of depression had statistically significant associations with depression [28]. Among PLWHA, alcohol abuse is associated with depression, non-adherence to medication, as well as an increased risk of engaging in risky behaviour [29, 30]. This study did not screen for alcohol abuse; however, the history of alcohol intake among the participants was significantly related to depression.

Participants who were stigmatised were twice as likely to be depressed as those who were not. Similarly, this stigma had a statistically significant association with depression in a study in northeast Nigeria, which compared depression, self-stigma and quality of life among adult patients on highly active antiretroviral therapy (HAART) and diabetics [31]. This was also in concordance with a study in Ethiopia [32] and south India [33]. These studies reported that PLWHA who were accessing ART services were significantly more likely to experience severe stigma [32, 33].

Participants who lived alone were about 3 times more likely to be depressed than those who lived with others. Similarly, a study in a tertiary hospital in southeast Nigeria evaluated depression among PLWHA and reported that living with others is significantly protective against having a depressive illness [21]. The author suggested that the extended family system played a supportive role. It may be that it reduces hopelessness and helplessness, which are key constructs in the diagnosis of depression [17]. Family members provide support, which reduces stigma and reduces the risk of psychological maladjustment [21].

Concerning treatment outcome measures, there was no statistically significant relationship between the CD4 counts of the participants and the occurrence of depression. This was in agreement with the findings from a study in Sao Paulo, Brazil, which evaluated depression in 46 HIV/AIDS in-patients admitted to the hospital of infectious disease [34]. Likewise, a study in India estimating the prevalence and factors associated with depression among clinically stable PLWHA on ART also found no association between the CD4 counts of the participants and depression [35]. This was also in concordance with a report from a cross-sectional study done in China [36]. However, a contrary finding from a study in northern Nigeria supported the association between depressive disorder and CD4 count. Patients with CD4 counts < 150 cells/μl were more likely to be depressed [15]. It may be inferred from these differences that psychosocial factors (such as stigma, cohabitation, isolation) have a stronger association with depression among PLWHA than the clinical outcome (CD4).

Limitations of the study

The cross-sectional nature of this study may limit the cause-and-effect interpretation of the factors observed. Since the study was hospital-based, it might not be generalisable to the total population of people living with HIV in the study environment.

Recommendations

A community-based study is recommended to yield findings that can be generalisable to the entire population.

Given the high prevalence of depression among patients with HIV/AIDS, mental health services should be an integral part of services offered to PLWHA.

National policies on intervention among PLWHA should be refocused to addressing social problems.

Conclusions

The burden of depression is high among PLWHA in the study setting, with behavioural and psychosocial factors being the major predictors of depression. Physicians play a vital role in identifying these patients and eliciting the specific factors associated with the occurrence of depression in them.

The findings from this study highlight the need for advocacy to ensure the incorporation of mental health care in HIV related programmes.

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