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RESEARCH ARTICLE

PREVALENCE AND SEVERITY OF DEPRESSION AMONG PEOPLE LIVING WITH HUMAN IMMUNODEFICIENCY VIRUS IN YENAGOA, SOUTHERN NIGERIA

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Abstract

Background: Depression is a mental health condition that affects approximately 350 million people worldwide. People living with HIV and AIDS (PLWHA) are at increased risk of developing this condition. Identification of location-specific factors is crucial to minimizing this presentation in this sub-population.
Aim: The aim of this study was to measure the prevalence, severity, and associated sociodemographic and comorbidity of depression among people living with HIV and AIDS in a laboratory setting in Yenagoa, southern Nigeria.
Methods: This is a cross-sectional study carried out on 282 PLWHA, aged 18 years and over. They receive HIV screening services in the laboratory of the Federal Medical Center, Yenagoa from March to April 2017. Sociodemographic data of respondents and selected comorbidities were collected using a modified structured questionnaire from the World Health Organization STEPS tool. Retrieving CD4+ count results from the laboratory registry, and height, weight, and body mass index (BMI) were measured. The presence of depression was assessed using the Patients Health Questionnaire-9 tool and performed a multivariate logistic regression analysis to identify factors associated with depression with a 95% confidence level.
Results: The mean age of the respondents was 40±8.8 years and most of them were females 195 (69.2%). Seventy-five (26.6%) of the respondents were depressed, of whom 10 (13.3%) had severe depression, while 41 (54.7%) had mild depression. The most common symptoms of depression were fatigue (30.1%) and dysphoria (28.7%). There was an association between depression and CD4+ count <350 cells/µL with an adjusted odds ratio (aOR) of 2.04 (95% CI: 1.14-3.63) and underweight with an aOR of 2.56 (95%CI: 1.01-6.47), while HAART with an aOR of 0.38 (95% CI: 0.18-0.84) was associated with decreased odds of developing depression.
Conclusion: Depression appeared among a significant proportion of people living with HIV and AIDS in Yenagoa, southern Nigeria, and fatigue was the most common symptom of depression. Lack of HAART, low CD4+ count, and being underweight appear to be the major factors negatively associated with depression. There is therefore a need to ensure people living with HIV and AIDS continue to receive HAART to improve CD4+ count and increase BMI.
Keywords: adjusted odds ratio (aOR), Depression, HIV, Mental health, Nigeria, Prevalence.

INTRODUCTION

Depression is an often long-lasting mental health condition[1] that is more than grief or sorrow; more severe and unpredictably persists longer[2]. It is a situation of public health concern globally that affects people in all societies and contributes to the burden of diseases[3] with a high economic load on society[1]. Almost 5% to 10% of the overall populace becomes depressed[2]. Depression was projected to affect approximately 350 million people worldwide[3], and is related to diverse causes consisting of events in someone's everyday life and several physical ailments. Predictions of Global Mortality and Burden of Disease report forecasts depression to be among the three foremost causes of disability by the year 2030[4]. It is one of the everyday health problems in the management of HIV infection and its complications

among People Living with Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) (PLWHA)[5]. Studies presented that PLWHA were more likely to have depression compared to the overall populace as they have about 2-7 times higher chance of developing depression[5,6]. In some locations, depression rates as high as 60.0% have been reported[2] and connected with poor quality of life[7] and high death rates[8]. Depression and HIV infection has been related because as the immune system worsens subsequent to the progression of HIV infection, symptoms such as, weakness, loss of weight, and memory loss occur[9].

A study to evaluate the occurrence of depression, and its risk features in Korea showed that more than 20.0% of the PLWHA suffer from depression related to poor observance to Highly Active Antiretroviral Therapy (HAART), comorbidities, and joblessness[10]. The study of Obadeji and colleagues in Nigeria, showed that of the 23.1% of the PLWHA with depression, 46.7% had mild depression, 50.0% had moderate depression, while 3.3% had severe depression with women accounting for 69.2%[11]. Also, in Nigeria, a comparable study reported a depressive illness of 56.7% among the respondents. The authors connected the depressive illness with gender and poor financial status[1]. In Cameroon, a study presented that the occurrence of depression among PLWHA was 26.7%[12]. A study among PLWHA in the Kathmandu Valley, Nepal reported a depression prevalence of 26.0%[13] while a similar study stated a depression prevalence of 24.5% in Hawassa, Ethiopia[14] . In the capital of Uttar Pradesh, depression prevalence described among PLWHA was 18.2%[15]. In comparison, 53.5% was reported in southern Brazil[16], 42.3% in São Paulo, Southeast Brazil[17], and 43.9% in Tigray, Ethiopia[18]. In sub-Saharan Africa, a systematic review and meta-analysis among PLWHA presented a depression prevalence of 9.0% to 32.0%[19]. A study among PLWHA in Sudan showed a moderate depression of 32.4% and a severe depression of 11.4%[20]. In the southeastern United States, tiredness was detected as one of the most common symptoms of depression among PLWHA while assessing depressive symptoms[20]. In Sao Paulo, South-East Brazil, depression was connected with a low CD4+ count[17]. This was substantiated by a study in Cameroon[12]. Also, studies have revealed that depression is connected with poor observance to HAART[10,15] .

Studies have reported many factors linked with depression among PLWHA, yet, data are still inadequate, contradictory, and may not be applicable in all environments and locations because most studies in the hospital environment were conducted in the wards and clinics settings with a scarcity of data from the laboratory settings, where the operation is dissimilar and where patients are exposed to frequent needle discomfort and trauma, arising from the collection of diverse specimens for laboratory investigations, and the outcome of the tests. It is important to measure the prevalence and severity and identify location-specific evidence associated with depression to minimize the disabling presentations among PLWHA. The aim of this study was to measure the prevalence, severity, and associated sociodemographic and comorbid factors of depression among people living with HIV and AIDS in the laboratory setting in Yenagoa, southern Nigeria.

MATERIALS AND METHODS

Study design and setting

A cross-sectional study was carried out on PLWHA receiving HIV-screening and other services in the laboratory of the Federal Medical Centre (FMC) Yenagoa, Bayelsa State, and southern Nigeria. This hospital laboratory site was selected because it is the central diagnostic facility in Bayelsa State, where PLWHA receives laboratory services.

Study population

Inclusion criteria

This study includes recently detected and old PLWHA, aged 18 years and over who came for HIV screening and the routine CD4+ count, viral load and other laboratory investigations at the Laboratory of FMC, Yenagoa from March to April 2017.

Exclusion criteria

Due to ethical concerns, PLWHA, aged 18 years and over who were pregnant, critically ill, and physically and mentally challenged to respond to questions were excluded.

Sampling technique

Except for the first, every third respondent who met the inclusion criteria and consented to participate was systematically and randomly recruited into the study. Before the survey, two Medical Laboratory Technicians were trained as research assistants for one day on the collection of the sociodemographic, the selected comorbid factors, and the depressive symptoms. The training was on the questionnaires administration, explanation and translation of the questions using Pidgin English, measurement of height and weight, confidentiality, and anonymity.

Sample size determination

To increase the power of the study, 282 respondents were interviewed from an estimated minimum sample size (n=273) calculated with the assumption of an anticipated depression prevalence of 23.1% from an earlier survey in Nigeria[11], the precision of 5%, a standard normal deviate of 1.96 at a 95% confidence level.

Data collection methods

Respondents' characteristics

The respondents' sociodemographic characteristics and selected comorbid factors were collected using an interviewer-administered modified structured questionnaire from the World Health Organization STEPS tool[22]. The CD4+ count results were retrieved from the HIV-laboratory register of FMC, Yenagoa. Physical inactivity was defined as less than five times of 30 minutes of moderate exercise per week, or less than three times of 20 minutes of vigorous activity per week.

Depressive symptoms

The presence of depressive symptoms within two weeks before the interview was assessed using an interviewer-administered Patients Health Questionn-

aire-9 (PHQ-9) tool[23]. PHQ-9 is an instrument used for screening, detecting, monitoring, and measuring severity of depression. Depression scores ranged from 0-3 points for each item, giving a maximum score of 27 from nine questions. For each question, the option, not at all is point 0; several days (point 1); more than half the days (point 2); and nearly every day (point 3). The presence of a depressive symptom was viewed as having a score point of 1-3. Afterwards, the scored points were summed up, and the total score was dichotomized into scores ≥5 (depression) and scored<5 (no depression). The depression category was further graded as mild (score: 5-9), moderate (score: 10-14) and severe (score: 15-27).

Anthropometric measurement

The respondents' height was measured while standing upright without shoes and documented to the nearest centimeters using a measuring tape (Komelon PG85 8m by 25mm Metric Gripper Tape, USA). Weight was measured with a standardized weighing scale (Camry Personal Scale, Model: BR9015A, Colombo) and recorded to the nearest kilogram. Body Mass Index (BMI) was calculated by dividing weight (kg) with height (m^2) and then dichotomized into BMI <18.5Kg/m^2 (underweight) and BMI ≥18.5Kg/m^2 (not underweight).

Statistical analyses

The data were analyzed with Epi Info 7.2 (CDC, Atlanta, USA). The descriptive statistics of the continuous variable (age) were summarized with mean and standard deviation, while the categorical variables were summarized as frequencies and percentages and displayed as tables and a chart. A bivariate analysis was done to test for association between the categorical dependent variable (depression) and categorical independent variables (sociodemographic data and selected comorbid factors). To prevent against residual confounding, the variables of known medical importance and p<0.25 during the bivariate analysis were entered into a multivariate logistic regression analysis to adjust for confounders and identify the factors independently associated with depression with a 95% confidence level.

Ethical consideration

Verbal and written informed consent was obtained from the respondents after clarifying the nature of the study, the benefits, and the risk involved. The study procedure was studied and permitted by the hospital's Ethical Review Committee. All procedures were per the ethical guidelines of the committee.

RESULTS

Respondents' characteristics in Yenagoa

Of the 282 respondents with mean age 40±8.8 (SD) years, the majority 107 (37.9%) were of the age-group 35-44 years, 195 (69.2%) were females, 248 (87.9%) were on HAART, 92 (32.6%) had CD4+ count <350 cell/µL while 23 (8.2%) were underweight, Table 1.

Respondents' depressive symptoms.

The most common symptoms of depression among the respondents were fatigue 85 (30.1%) and dysphoria 81 (28.7%), Table 2.

Prevalence and severity of depression among the respondents in Yenagoa

The overall prevalence of depression was 26.6%. Out of this, 10 (13.3%) of the respondents had severe depression, Figure 1.

Table 1: Characteristics of the respondents (N=282).

Characteristics	Frequency (%)
Age group (Years)	
25-34	80 (28.4)
35-44	107 (37.9)
45-64	95 (33.7)
Sex	
Male	87 (30.8)
Female	195 (69.2)
Education	
≤Primary School	65 (23.1)
≥Secondary School	217 (76.9)
Employment	
Unemployed	209 (74.1)
Employed	73 (25.9)
Marital Status	
Not Married	127 (45.0)
Married	155 (55.0)
Monthly Income	
<₦18000.00	166 (58.9)
≥₦18000.00	116 (41.1)
HAART	
Yes	248 (87.9)
No	34 (12.1)
Homeownership	
Rent home	178 (63.1)
Own Home	104 (36.9)
Alcohol Use	
Never Use	129 (45.7)
Currently or Ever Use	153 (54.3)
Smoking Status	
Never Smoke	234 (83.0)
Ever or Current Smoker	48 (17.0)
Physical Activity	
Inactive	57 (20.2)
Active	225 (79.8)
Diabetes Mellitus	
Yes	20 (7.1)
No	262 (92.9)
Hypertension	
Yes	52 (18.4)
No	230 (81.6)
BMI	
<18.5Kg/m^2	23 (8.2)
≥18.5Kg/m^2	259 (91.8)
CD4+ Count	
<350 cells/µL	92 (32.6)
≥350cells/µL	190 (67.4)

BMI=Body Mass Index, CD4=Cluster of Differentiation, HAART=Highly Active Antiretroviral Therapy

Association between characteristics of respondents and depression in Yenagoa.

Respondents on HAART were 65% less likely to have depression, prevalence odds ratio (POR) of 0.35 (95%CI: 0.17-0.73) compared to persons not on HAART. The odds of having depression were 2.79 times higher among the underweight (BMI <18.5 Kg/m^2) POR 2.79 (1.18-6.64) compared to those who

were not underweight (BMI ≥18.5Kg/m^2). Those with CD4+ count <350 cells/µL had 2.30 times higher chances of depression, POR 2.30 (95% CI: 1.33-3.98) compared to individuals with CD4+ count ≥350 cells/µL, Table 3.

Factors associated with depression among respondents in Yenagoa, Nigeria.

After adjusting for age and other selected variables, the independent factors associated with depression were HAART, adjusted odds ratio (aOR) 0.38 (95%CI: 0.18-0.84); CD4+ count<350 cells/µL, aOR 2.04 (95%CI: 1.14-3.63), and underweight (BMI <18.5 Kg/m^2) aOR 2.56 (95%CI: 1.01-6.47), Table 3.

Table 2: Respondents' depressive symptoms (N=282).

Depressive Symptom	Frequency (%)
Ideation on Suicide	17 (6.0)
Psychomotor Change	36 (12.8)
Poor Concentration	64 (22.7)
Sleep Disturbance	67 (23.5)
Poor Appetite	68 (24.1)
Negative Self-Assessment	69 (24.2)
Anhedonia	72 (25.5)
Dysphoria	81 (28.7)
Fatigue or Tiredness	85 (30.1)

Table 3: Association between depression and respondents' characteristics.

		Depression	Bivariate analysis		Multivariable analysis	
Characteristics	**N=282**	**n (%)**	**POR (95%CI)**	***P*-value**	**aOR (95%CI)**	**P-value**
Age-group (Years)						
25-34	80	23 (28.8)	1			
35-44	107	25 (23.4)	0.76 (0.39-1.46)	0.696	-	-
45-64	95	27 (28.4)	0.98 (0.51-1.90)	0.962	-	-
Sex						
Female	195	54 (27.8)	1		1	
Male	87	21 (24.1)	0.83 (0.46-1.49)	0.533	0.76 (0.38-1.53)	0.444
Education						
≥Secondary school	217	57 (26.3)	1			
≤Primary school	65	18 (27.7)	1.08 (0.58-2.00)	0.820	-	-
Employment						
Employed	73	17 (23.3)	1			
Unemployed	209	58 (27.7)	1.27 (0.68-2.36)	0.457	-	-
Marital status						
Married	155	37 (23.9)	1			
Not married	127	38 (29.9)	1.36 (0.80-2.31)	0.253	-	-
Monthly income						
≥₦18000.00	116	25 (21.6)	1			
<₦18000.00	166	50 (30.1)	1.57 (0.90-2.73)	0.109	1.48 (0.82-2.67)	0.188
HAART						
No	34	16 (47.1)	1			
Yes	248	59 (23.8)	0.35 (0.17-0.73)	0.004	0.38 (0.18-0.84)	0.017**
Homeownership						
Own home	104	28 (26.9)	1			
Rent home	178	47 (26.4)	0.97 (0.56-1.68)	0.924	-	-
Alcohol use						
Never use	129	31 (24.0)	1			
Currently or ever use	153	44 (28.8)	1.28 (0.75-2.18)	0.371	1.24 (0.66-2.35)	0.501
Smoking status						
Never smoke	234	60 (25.6)	1			
Ever or current smoker	48	15 (31.3)	1.32 (0.67-2.60)	0.423	1.30 (0.55-3.07)	0.550
Physical activity						
Active	225	58 (25.8)	1			
Inactive	57	17 (29.8)	1.23 (0.64-2.32)	0.537	1.28 (0.65-2.54)	0.479
Diabetes mellitus						
No	262	67 (25.6)	1			
Yes	20	8 (40.0)	1.94 (0.76-4.95)	0.159	2.59 (0.95-7.07)	0.064
Hypertension						
No	230	62 (27.0)	1			
Yes	52	13 (25.0)	0.90 (0.45-1.80)	0.773	-	-
BMI						
≥18.5Kg/m^2	259	64 (24.7)	1			
<18.5Kg/m^2	23	11 (47.8)	2.79 (1.18-6.64)	0.016	2.56 (1.01-6.47)	0.048**
CD4+ Count						
≥350 cells/µL	190	40 (21.1)	1			
<350 cells/µL	92	35 (38.0)	2.30 (1.33-3.98)	0.003	2.04 (1.14-3.63)	0.016**

**Statistically significant at *P*<0.05, POR=Prevalence Odds Ratio, aOR=Adjusted Odds Ratio, BMI=Body Mass Index, CD4=Cluster of Differentiation, HAART=Highly Active Antiretroviral Therapy

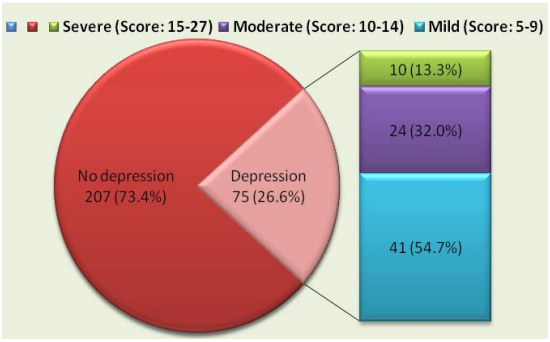

Figure 1: Prevalence and severity of depression among the respondents.

DISCUSSION

This research has established a depression prevalence of 26.6% among PLWHA in Yenagoa, southern Nigeria. Previous studies conducted among PLWHA in Cameroon[12], Kathmandu Valley, Nepal[13], and Ethiopia[14], Iran[26], support this finding. Nevertheless, the occurrence reported in this research is higher compared to the survey carried out in the capital of Uttar Pradesh, [15] Sagamu, Nigeria[11] and lower than the proportion reported among PLWHA in southern Brazil[16], São Paulo, Southeast Brazil[17] and Tigray, Ethiopia[18]. These variations may be attributed to the settings, the different survey tools used, the cut-off points, and the sampling techniques employed. The various survey tools used in these studies were the Beck Depression Inventory[11,15-17] the Structured Clinical Interview for DSM-IV[9], and the Hamilton Depression Rating Scale[18]. Although the prevalence of depression varies in different reports, the findings in this study may be an indicator that depression is a common occurrence among the PLWHA in Yenagoa, southern Nigeria, and lies within the 9.0% and 32.0% reported in sub-Saharan Africa[19]. Concerning the severity of depression, the moderate depression (32.0%) and severe depression (13.3%) reported in this study are comparable to the research conducted in Sudan which presented a moderate depression of 32.4% and a severe depression of 11.4%[20]. Correspondingly, in this study, the most common symptom of depression is fatigue. This finding is supported by a preceding survey in the southeastern United States which described fatigue as one of the most common depressive symptoms[21]. The occurrence of fatigue (30.1%) as the most common symptom of depression in this survey corresponds with the knowledge that it is a significant symptom of HIV infection. Because as HIV infection progresses, it damages the immune system, and symptoms such as fatigue and loss of memory appear[11].

This study also exposed that a low CD4+ count is an independent risk factor associated with depression. Those with a low CD4+ count had a higher chance of coming down with depression compared to those without a low CD4+ count. This result was in agreement with the studies in Sao Paulo, South-East Brazil[17], Southwest Regional Hospitals of Cameroon[12], and Ethiopia[14,24] which reported a connection between depression and low CD4+ count among PLWHA. Studies have revealed that depression is connected with poor devotion to treatment, low quality of life, [7] and high mortality rates[8] because as HIV destroys the immune system, depressive symptoms such as loss of memory start to appear[9]. Thus, this outcome may be connected to poor treatment adherence on the part of those on HAART, and the newly diagnosed not yet on HAART.

Furthermore, findings from this study have established that PLWHA who are on HAART have lower odds of developing depression compared to those who were not on HAART. This observation was in agreement with earlier research which reported an association between depression and poor adherence to HAART[10,15]. Studies have shown that immunological responses have a psychological effect on PLWHA[9,17]. This protective association indicates that HAART leads to an increased CD4+ count level, which improves the immunity and cognitive outcomes of PLWHA. Also, this study has revealed that PLWHA who were underweight (BMI<18.5kg/m^2) have a higher chance of depression compared to persons that were not underweight (BMI ≥18.5kg/m^2). When depressed, many people lose their appetite and lose weight while many people lose weight because of a slowdown in body metabolism[25]. Depression and weight loss are common among PLWHA. Since poor appetite is a common symptom of depression, this could have led to a reduction in BMI. Thus, the low BMI classified as underweight among PLWHA could also be linked to depression because as HIV infection progresses without proper treatment, it destroys the immunity, which terminates in AIDS which leads to weight loss and short-term memory loss[9]. The association between low BMI and depression may be a pointer that underweight PLWHA has a higher odd of depression compared to the PLWHA who are not underweight.

Limitations of the study

Unlike a prospective cohort study which is expensive and where the exposed people are followed up for a period of time for the outcome, this is a cross-sectional study where the respondents' data on exposure and outcome were collected at the same time to save cost and time; consequently, the study association may not establish causality.

CONCLUSIONS

Depression appeared among a significant proportion of people living with HIV and AIDS in Yenagoa, southern Nigeria, and fatigue and dysphoria were the most common symptoms of depression. Lack of HAART, low CD4+ count, and being underweight appear to be major factors negatively associated with depression. There is therefore a need to ensure that people living with HIV and AIDS continue to receive HAART to improve CD4+ counts and increase BMI.

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AUTHOR'S CONTRIBUTIONS

Tebeda BW: conceptualization, data curation, analysis, investigation, methodology, project administration, supervision, validation, visualization, original draft writing, review writing, editing, draft correction. **Inedi FA:** data curation, investigation, methodology, review, draft correction. The final manuscript was read and approved by both authors.

DATA AVAILABILITY

The data and material are available from the corresponding author on reasonable request.

CONFLICT OF INTEREST

None to declare.

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