Journal of Family Medicine and Health Care
2018; 4(4): 26-32
http://www.sciencepublishinggroup.com/j/jfmhc
doi: 10.11648/j.jfmhc.20180404.12
ISSN: 2469-8326 (Print); ISSN: 2469-8342 (Online)

Prevalence of Depression and Associated Factors in HIV-Positive Adults Attending an Antiretroviral Clinic in Jos, Nigeria

Halima Mwuese Sule[1, *], Patricia Aladi Agaba[1], Raphael Onu Ojoh[2], Michael Terkura Agbir[3], Kingsley Mayowa Okonoda[4]

[1]Department of Family Medicine, University of Jos/Jos University Teaching Hospital, Jos, Nigeria

[2]Department of Family Medicine, Jos University Teaching Hospital, Jos, Nigeria

[3]Department of Psychiatry, Benue State University, Makurdi, Nigeria

[4]Department of Psychiatry, University of Jos/Jos University Teaching Hospital, Jos, Nigeria

Email address:

haltsav@yahoo.com (H. M. Sule)

[*]Corresponding author

To cite this article:

Halima Mwuese Sule, Patricia Aladi Agaba, Raphael Onu Ojoh, Michael Terkura Agbir, Kingsley Mayowa Okonoda. Prevalence of Depression and Associated Factors in HIV-Positive Adults Attending an Antiretroviral Clinic in Jos, Nigeria. *Journal of Family Medicine and Health Care.* Vol. 4, No. 4, 2018, pp. 26-32. doi: 10.11648/j.jfmhc.20180404.12

Received: November 19, 2018; **Accepted**: December 5, 2018; **Published**: January 14, 2019

Abstract: Clinical depression has been associated with various chronic disease conditions. The chronic course of HIV, fostered by the use of antiretroviral therapy in infected patients, puts them at risk of developing clinical depression which unfortunately, is often underdiagnosed and therefore undertreated. The study estimated the prevalence of depression and associated factors amongst adult patients receiving antiretroviral therapy in a clinic in Jos, using the PHQ-9 questionnaire. Three hundred and fourteen patients with a mean age of 45 ± 10 years were enrolled in a descriptive cross-sectional study. There were 63 males and 251 females, with mean known duration of HIV infection of 11 ± 4 years. Depression was found to be common in the group. Thirty one percent of the patients had depression, and of these, 83 (85%) had mild depression while 12 (12%) had moderate depression and 3 (3%) had moderately severe depression. The factors associated with depression in these patients were analysed using logistic regression. Female gender (P=0.02) as well as age equal to or greater than 45 years (P= 0.03) were shown to be significantly associated with depression. When encountered in such patients, the factors identified to be associated with depression, should serve not only to raise the index of suspicion towards this diagnosis but should also prompt the need to screen for depression. This will contribute to enhancing the chances of diagnosing and treating depression in HIV.

Keywords: Prevalence, HIV, Depression, Adult, Nigeria

1. Introduction

Depression also known as major depressive disorder or clinical depression is a common mental health disorder that results in persistent sadness and loss of interest in activities previously enjoyed, for a period of at least 2 weeks [1]. It is commonly present as comorbidity in many chronic illnesses adding to the overall burden of disease [2]. One of such chronic illnesses is disease caused by infection with the human immunodeficiency virus (HIV) which has become a global pandemic with close to 36.9 million people living with the disease worldwide by the end of 2017, and 1 million deaths from the disease in the same year [3].

The use of antiretroviral therapy (ART) has changed the course of the disease from a terminal to a chronic pathway, with HIV-infected patients living longer [4]. Consequent upon this extended survival is an associated susceptibility to the development of mental health disorders enhanced by the challenges of living with HIV. Mental health disorders are associated with HIV infection in one or more of the

following ways - as a risk factor for acquiring the infection, a comorbidity/complication of infection or as a mediator for disease progression [5].

Depression has been identified by the World Health Organization (WHO) as a major contributor to the global burden of disease and has been labelled the leading cause of disability worldwide [6]. Depression is the commonest mental health disorder among HIV-positive adults [7-9], and it has been found to occur more commonly among the HIV-infected population than in the non-infected [10 – 12]; one study in Nigeria found depression to be five times more common in people living with HIV/AIDS (PLWHA) [11]. Prevalence rates of depression among HIV-infected patients vary globally [10, 13–15], and some settings have documented rates as high as 60% or greater [16 – 18]. In sub Saharan Africa, which accounts for two-thirds of the global HIV pandemic, pooled prevalence estimate rates range between 9-32% [19, 20]. Similar to what obtains in study findings across the globe, researcher in some parts of Nigeria have also demonstrated that depression commonly coexists with HIV infection, in most cases with a high prevalence [21 – 23]. Most of these studies have shown that female gender, low socioeconomic status, lower educational level, low quality of life and lack of social support are some factors correlated with depression in HIV-positive patients. Depression in HIV could be as a result of the impact of any one or more of the following - the direct effect of HIV on the brain, the challenges of coping with the diagnosis, disease symptoms and complications, antiretroviral drug side effects as well as associated social challenges such as stigma, strained relationships, loss of loved ones, job loss and poverty [24].

Depression has a negative consequence on clinical outcomes in HIV-infected patients, by way of reducing medication adherence, quality of life, treatment outcome, worsening progression of the disease thereby increasing morbidity and mortality [25, 26]. Because feelings of sadness and grief often accompany a diagnosis of HIV infection, when these moods are encountered in HIV-positive patients they are commonly considered to be a normal process and this could lead to misdiagnosis or under diagnosis of depression and therefore, undertreatment. The danger in not diagnosing depression where it exists is the resultant failure to provide the appropriate necessary treatment or referral, consequently resulting in poorer patient outcomes. Incorporation of depression screening into HIV care programmes in Nigeria, which is currently not being done in most centres, would help to improve the rate of diagnosis and ultimately treatment with better overall treatment outcomes.

Various tools exist for assessing depression. One of such tools commonly used in primary care is the Patient Health Questionnaire 9 (PHQ-9) [27]. It is a self-administered easy to use adaptation of the Primary Care Evaluation of Mental Disorder (PRIME –MD) diagnostic instrument for common mental disorders [27]. It has been validated for use in primary care and is composed of 9 DSM IV criteria, each of which are scored ranging from 0 (not at all) to 3 (nearly every day) [28]. Its use has been tested and validated in Nigeria [29]. The PHQ-9 can be used to make a diagnosis of depression as well as monitor the severity and response to treatment. The advantage of the PHQ-9 is that it can be administered by varying categories of healthcare staff and it can be administered using different approaches such that in situations where patients experience difficulties in reading or understanding, they can be assisted by a healthcare staff in completing the questionnaire [30].

Though there have been similar studies in Nigeria, none has been conducted among PLWHA in Jos. This current study sought to determine the prevalence and severity of depression, and any associations with sociodemographic and clinical parameters. Such associations, when recognized, would be useful in identifying those at risk and therefore prompt the need for screening to aid early diagnosis and treatment.

2. Methodology

The study was carried out in Jos, Plateau State, northcentral Nigeria. It was a hospital based, descriptive cross-sectional study conducted in one of the largest HIV care centres in the country. Sample size was determined using a standard formula [31]. The participants were recruited over 8 weeks by systematic random sampling and consisted of 314 adults; 63 males and 251 females, aged 18 years or older, enrolled at the Adult Clinic of AIDS Prevention Initiative in Nigeria (APIN), JUTH, who had been receiving antiretroviral therapy for at least 1 year and had given consent to participate in the study. Patients who were not on ART or who had not been on ART for up to 1 year, currently on treatment for depression and very sick patients were excluded from the study. A questionnaire was administered to obtain the following data:

i Sociodemographic information that included age, sex, religion, marital status, monthly income, employment status, educational status, current domicile, known duration of HIV diagnosis and personal/family history of depression.

ii Clinical information that included current ART regimen, most recent CD4 count, most recent viral load level, percentage adherence (from Patients records), and body mass index calculated from patient's weight in kilograms/height in meters squared.

iii Depression category using the PHQ-9 questionnaire: For each of the 9 questions in the questionnaire, there were four possible options and the patients were required to choose 1 for each question. The scores awarded for each of the four options were as follows: 'not at all'-0; 'several days'-1; 'more than half the days'- 2; 'nearly every day' -3. The scores from all nine answers were added to obtain a final total which was graded to determine absence or presence of depression and the severity as follows: 0-4 =minimal or none; 5-9=mild; 10-14=moderate; 15-19=moderately severe; 20-27=severe. Overall,

participants with total scores of 0 – 4 were considered not to have depression while participants with scores of ≥ 5 – 27 were considered to have depression.

2.1. Ethical Consideration

Ethical clearance was obtained from the Human Research and Ethics Committee of Jos University Teaching Hospital (JUTH). Permission to carry out the study was obtained from APIN management. Written informed consent was obtained from all participants. Data obtained was kept anonymous and confidential.

2.2. Data Analysis

Data was analysed using Epi info statistical software version 7 (CDC Atlanta, GA, USA). Variables were expressed as frequencies and percentages. Association between variables was determined using logistic regression. A confidence level of 95% was used for the study and a P value of ≤ 0.5 was considered statistically significant.

3. Results

A total of 314 adult patients were enrolled in the study with 67% of them being urban dwellers. There were 63 males (20%) and 251 females (80%). The age range was 18 – 75 years, with a mean age of 45 ± 10 years, and the largest numbers of participants were in the age group 41 – 50 years. The mean known duration of HIV diagnosis was 11 ± 4 years. A greater proportion of the participants were Christians (83%), married (49%) and had either secondary or tertiary education (54%). More than half of them (56%) were employed, but only 31% earned above the minimum wage of 18,000 Naira. Forty-four percent of the participants had a normal BMI while 52% were either obese or overweight and only 3% were underweight. Majority of the participants (93%) had a viral load of less than 1000 RNA copies/ml, while 50% had a CD4 cell count of equal to or greater than 500 cells/mm^3. More of the participants (43%) had WHO stage 1 disease. Thirty-nine percent of them were on efavirenz-containing ART regimen and 82% of all the participants had an adherence percentage of equal to or greater than 95%. Of the total number of participants, only 1% admitted to a past personal or family history of depression. (Table 1)

Thirty-one percent of the patients had some degree of depression with the greatest proportion of those depressed (26%) having mild depression and only 1% had moderately severe depression. (Table 2)

Logistic regression analysis showed that the female gender and older age group of ≥ 45 years were significantly associated with depression (P-value 0.02 and 0.03 respectively). Religion, marital status, educational level, employment status, monthly income, current domicile, adherence log, CD4 count and viral load level was not significantly associated with depression in this group of patients. (Table 3)

Table 1. *Sociodemographic and clinical Characteristics of participants.*

Variables	Frequency (n = 314)	Percentage %
Age group (years)		
18 – 30	19	6
31 – 40	92	29
41 – 50	118	38
51 – 60	62	20
>60	23	7
Sex		
Male	63	20
Female	251	80
Religion		
Christianity	261	83
Islam	53	17
Marital status		
Never married	24	8
Married	153	49
Separated	13	4
Divorced	19	6
Widowed	105	33
Education status		
No formal education	61	19
Primary	88	28
Secondary	81	26
Tertiary	84	27
Employment status		
Unemployed	138	44
Employed	176	56
Monthly income		
Below NGN 18,000	218	69
Above NGN 18,000	96	31
Known duration of HIV diagnosis		
< 10 years	93	30

Variables	Frequency (n = 314)	Percentage %
≥ 10 years	221	70
Body mass index		
Underweight	10	3
Normal	138	44
Overweight	115	37
Obese	51	16
WHO class		
I	133	42
II	87	28
III	76	24
IV	18	6
Recent CD4 count cells/mm^3		
< 500	157	50
≥ 500	157	50
Recent viral load RNA copies/ml		
<1000	291	93
≥1000	23	7
Efavirenz-containing ART regimen		
Yes	121	39
no	193	61
Adherence percentage		
< 95	58	18
≥ 95	256	82
Past personal history /family history of mental illness		
Yes	3	1
No	311	99

Table 2. *Depression severity among the study participants (n = 314).*

Variables	Frequency	Percentage (%)
Depression severity (PHQ-9 score)		
None (0 - 4)	216	69
Mild (5 – 9)	83	26
Moderate (10 – 14)	12	4
Moderately severe (15 – 19)	3	1
Severe (20 –27)	None	0

Table 3. *Determinants of depression in adult HIV-infected patients.*

Factors	Odds ratio	95% Confidence Interval	P-value
Age group			
18 – 44	1	-	-
45 - > 60	0.5027	0.2751 - 0.9187	0.03*
Sex			
Male	1	-	-
Female	3.0798	1.2329 - 7.6931	0.02*
Religion			
Islam	1	-	-
Christianity	0.4334	0.1847 1.0171	0.06
Marital status			
Never Married	1	-	-
Ever Married	4.5397	0.9703 - 21.2405	0.06
Educational status			
None –Primary	1	-	-
Secondary - Tertiary	0.5671	0.3004 - 1.0705	0.08
Employment status			
Unemployed	1	-	-
Employed	1.6276	0.8061 - 3.2860	0.17
Monthly income			
< N18,000	1	-	-
≥18,000	0.6515	0.3041 - 1.3954	0.27
Duration of HIV diagnosis			
<10 years	1	-	-
≥10 years	1.0392	0.5513 - 1.9588	0.91
BMI kg/m^2			
<25	1	-	-
≥ 25	0.8462	0.5247 – 1.3646	0.50

Factors	Odds ratio	95% Confidence Interval	P-value
WHO stage			
I/II	1	-	-
III/IV	0.8457	0.4984 – 1.4349	0.53
CD4 count cells/mm^3			
<500	1	-	-
≥500	0.6095	0.3398 - 1.0930	0.10
Viral load RNA copies /ml			
<1000	1	-	-
≥ 1000	1.1911	0.4875 2.9102	0.70
Percentage adherence			
<95%	1	-	-
≥ 95%	0.7866	0.3718 - 1.6643	0.53

*statistically significant

4. Discussion

In this study carried out to assess the prevalence of depression and its associated factors among HIV-infected adults, the prevalence of depression was found to be 31%; which encompassed participants with mild, moderate and moderately severe categories of depression, according to PHQ-9 classification. The overall prevalence of 31% was considered to be high and suggests that depression is common among PLWHA attending the adult ART clinic in JUTH.

The prevalence in this study conducted in northcentral Nigeria is comparable to the result of a similar study conducted in Eastern Nigeria where a prevalence of 33% was reported [20]. Other studies in a similar group of patients in Nigeria have shown lower prevalence rates than this current study including reports from Zaria in northern Nigeria (21.3%) [23], Sagamu 23.1% [32], and Lagos 28.7% [33], both in western Nigeria, and Benin in southern Nigeria, 29.3% [11] while yet other studies showed higher prevalence rates as follows: Imo 39.1% [21], Ekiti 39.6% [34], Ilorin 56.7 [35]. These differences may be attributable to factors related to time of study and geographical location. In Botswana and South Africa, prevalence rates ranging between 24-38% [36] and 41-71.8% 18, [37] respectively have been reported. When the prevalence rates in more recent studies including this index study, are compared to rates reported in earlier studies, it is evident that the prevalence rate for depression in HIV-infected persons is on a rising trend. This can be explained by the extended lifespan of PLWHA on ART, and their associated increased proneness to developing depression which adds to the increasing number of cases of depression in PLWHA. A study in the United States (US) reported a prevalence of 25.6 % which is slightly lower than that of this study [10]. Apart from varying geographical location between the two studies, the US study was conducted with a nationally representative sample utilising population based data.

In this study, depression was found to be significantly associated with being female (P= 0.02). This concurs with the findings of several other researchers locally in Nigeria and some parts of Africa and in the US [9] who have also reported depression to be more common in females infected with HIV compared to their male counterparts [10, 11, 21, 23, 32, 35, 38]. In contrast, Bongongo in SA study reported greater male prevalence though this was not statistically significant [18]. The reason for the higher female prevalence seen may be related to women comprising the majority of HIV-infected adults in sub-Saharan Africa which in turn is as a result of various economic, cultural, biological and social factors [39].

Older age of 45 years and above was found to be significantly associated with depression in this study. This may have been related to the fact that older age is usually associated with other chronic illnesses that could predispose to depression. The presence of other chronic illness was not sought in the study participants. The significant association with older age group may also be due to the increased survival to old age afforded by the use of ART, resulting in more people of older age group living with the chronic HIV disease and its challenges that predispose them to the vulnerability of depression known to accompany chronic illnesses. The mean age of 45 ± 10 years in this study population was higher than what was obtained in several other Nigerian studies conducted in a similar group of patients [11, 21, 23, 32, 35]. The US study also reported a larger proportion of participants older than 45 years [10].

This study also reviewed factors such as duration of HIV infection, adherence, Efavirenz-containing ART regimen, employment status, monthly income, educational status, marital status, WHO stage of disease, CD4 cell count and viral load level to determine any significant associations with depression, but none were found, and this is not to different from the results of a similar Nigerian study in Sagamu [32] and elsewhere in Uganda [38]. In other similar studies, several sociodemographic and clinical factors such as social support, unemployment, stigma, illness duration, low income, illiteracy, low CD4, being divorced or widowed, substance abuse, quality of life and stressful life events have been reported to have significant relationships with depression in HIV-infected patients [10, 11, 18, 21-23, 32, 34, 35, 38]. The importance of identifying factors associated with depression in HIV is linked to the need to recognize identifiable risk factors for depression when it is present so as to raise the index of suspicion necessary to prompt healthcare providers to screen such patients for depression. This is even more important where all patients cannot be screened

routinely. The benefit would be early diagnosis and treatment, thereby reducing the rate of undiagnosed and untreated depression and the ensuing complications. This would contribute in reducing the additional burden of depression in PLWHA.

Although using a simple primary care tool such as the PHQ-9 questionnaire to screen patients in ART programmes is desirable as a routine to be incorporated in HIV care programs, this may not be entirely feasible in developing countries like Nigeria due to shortage of the required manpower in large and busy clinics, however an awareness of the risk factors associated with depression could help to identify selected cases for screening and subsequent treatment or referral.

Despite the high prevalence of depression in HIV reported by many studies including the current study, when symptoms of depression occur in patients they are often unnoticed or assumed to be a reaction to their HIV diagnosis, and therefore remain untreated thus adding to the burden of HIV and worsening outcomes.

Limitations of this study include the small size which may have obscured findings. Also, because the study was hospital based the findings cannot be generalized. None the less, this study can form the background for larger community based studies using the same tool to yield less obscure and more generalizable results.

5. Conclusion

The prevalence of depression in this group of HIV-infected patients was high and significantly associated with being female and being aged 45 years or older. Feelings of sadness in PLWHA should not be dismissed as normal, rather such symptoms should call for further screening in them for depression, particularly in females and older persons belonging to age group 45 years and older.

Conflict of Interest

The authors declare no conflict of interest

Acknowledgements

The authors acknowledge the US Department of Health and Human Services, Health Resources and Services Administration (U51HA02522) and the Centers for Disease Control and Prevention (CDC) in partnership with APIN Lte (PS 001058) who fund HIV/AIDS care and treatment services at APIN, JUTH, Jos Nigeria. The authors bear sole responsibility for the content of this research.

References

[1] WHO 2017. Depression. Available from: http://www.who.int/mental_health/management/depression/en/ Accessed on May 18, 2018.

[2] Ferrari AJ, Charlson FJ, Norman RE, Patten SB, Freedman G, Murray CJ et al. Burden of depressive disorders by country, sex, age and year: findings from the Global Burden of Disease Study 2010. PLoS Med. 2013; 10(11): e1001547.

[3] WHO 2017. Global Health Observatory data. Available from: http://www.who.int/gho/hiv/en/ . Accessed on May 18, 2018.

[4] Calvin J. HIV/AIDS, chronic diseases and globalisation. Global Health. 2011; 7:31

[5] Benton T. Depression and HIV/AIDS. Curr Psych Rep.2008; 10(3): 280-5.

[6] WHO 2018. Depression. Available from: http://www.who.int/news-room/fact-sheets/detail/depression . Accessed November 17, 2018

[7] Rabkin JG. HIV and Depression: 2008 review and update. Curr HIV/AIDS Rep. 2008; 5(4):163-71.

[8] Brandt R. The mental health of people living with HIV/AIDS in Africa: a systematic review. Afr J AIDS Res. 2009; 8(2):123-33.

[9] Valente SM. Depression and HIV disease. J Assoc Nurses AIDS Care. 2003; 14(2): 41-51.

[10] Do AN, Rosenberg ES, Sullivan PS, Beer L, Strine TW, Schulden JD, Fagan JL et al. 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. 2014; 9(3): e92842.

[11] Chikezie UE, Otakpor AN, Kuteyi OB, James BO. Depression among people living with human immunodeficiency virus infection/acquired immunodeficiency syndrome in Benin City, Nigeria: A comparative study. Niger J Clin Pract. 2013; 16(2):238-42.

[12] Ciesla J. A., Roberts J. E. Meta-Analysis of the Relationship Between HIV Infection and Risk for Depressive Disorders. Am J Psychiatr. 2001; 158(5): 725–30.

[13] Mohammed M, Mengistie B, Dessie Y, Godana W. Prevalence of depression and associated factors among HIV patients seeking treatments in ART Clinics at Harar town, eastern Ethiopia. J AIDS Clin Res. 2015; 6:474.

[14] Hussain S, Devi N, Gupta AK, Azharuddin M. Prevalence and correlates of depression among HIV-positive patients in Bihar, India: a cross-sectional study. Sex Transm Infect. 2017; 93(2): A167.

[15] Yun LWH, Maravi M, Kobayashi JS, Barton PL, Davidson AJ. Antidepressant treatment improves adherence to antiretroviral therapy among depressed HIV-infected patients. J Acquir Immune Defic Syndr. 2005; 38(4):432–38.

[16] WHO. 2017. Let's talk: Depression among people with HIV. Available at http://www.who.int/hiv/mediacentre/news/hiv-depdepession/en/ . Accessed May 19, 2018.

[17] Bhatia MS, Munjal S. Prevalence of depression in people living with HIV/AIDS undergoing ART and factors associated with it. J Clin Diagn Res. 2014; 8(10): WC01-WC04.

[18] Bongongo T, Tumbo J, Govender I. Depressive features among adult patients receiving antiretroviral therapy for HIV in Rustenburg district, SA. S Afr J Psych. 2013; 19(2): 31-4.

[19] Bernard C, Dabis F, Rekeneire N. 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): e0181960.

[20] Onyebuchi-Iwudibia O, Brown Amy. HIV and depression in Eastern Nigeria: The role of HIV-related stigma. AIDS Care. 2014; 26(5): 653-7.

[21] Aguocha CM, Uwakwe RU, Duru CB, Diwe KC, Aguocha JK, Enwere OO, and Olose EO. Prevalence and socio-demographic determinants of depression among patients attending HIV/AIDS Clinic in a teaching hospital in Imo State, Nigeria. Am J Med Sci Medic. 2015; 3(6): 106-12.

[22] Adewuya AO, Afolabi MO, Ola BA, Ogundele OA, Ajibare OA, Oladipo BF. Psychiatric disorders among the HIV-positive population in Nigeria: a control study. J Psychosom Res. 2007; 63(2):203-6.

[23] Olisah VO, Baiyewu O, Sheikh TL. Adherence to highly active antiretroviral therapy in depressed patients with HIV/AIDS attending a Nigerian university teaching hospital clinic. Afr J Psychiatr.2010; 13(4): 275-9.

[24] Gibbie T, Mijch A, Ellen S, Hoy J, Hutchison C, Wright E et al. Depression and neuro-cognitive performance in individuals with HIV/AIDS: 2-year follow-up. HIV Medicine.2006; 7(2): 112-21.

[25] Nanni MG, Caruso R, Mitchell AJ, Meggiolaro E, Grassi L. Depression in HIV infected patients: a review. Curr Psychiat Rep. 2015; 17(1): 530.

[26] Hartzell JD, Janke IE, Weintrob AC. Impact of depression on HIV outcomes in the HAART era. J Antimicrob Chemother. 2008; 62(2):246-55.

[27] Cameron IM, Crawford JR. Lawton K, Reid IC. Psychometric comparison of PHQ-9 and HADS for measuring depression severity in primary care. Br J Gen Pract. 2008; 58(546):32-6.

[28] Kroenke K, Spitzer RL, WilliamJB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001; 16(9):606-13.

[29] Adewuya AO, Ola BA, Afolabi OO. Validity of the patient health questionnaire (PHQ-9) as a screening tool for depression amongst Nigerian university students. J Affect Dis. 2006; 96:89-93.

[30] New York State Department of Health. Administering the Patient Health Questionnaires 2 and 9(PHQ 2 and 9) in integrated care settings. 2016. Available at: https://www.health.ny.gov/health_care/medicaid/redesign/dsrip/docs/2016-07-01_phq_2_and_9_clean.pdf . Accessed May 28, 2018.

[31] Jekel JF, Katz DL, Elmore JG. Sample size, randomisation and probability theory. In; Epidemiology, biostatistics and preventive medicine. 2nd ed. Philadelphia, USA: W. B Saunders; 2001:194-9.

[32] Obadeji A, Ogunlesi AO, Adebowale TO. Prevalence and predictors of depression in people living with HIV/AIDS attending an outpatient clinic in Nigeria. Iran Psychiatr Behav Sci. 2014; 8(1):26-31.

[33] Adeyuwa AO. Afolabi MO, Ola BA, Ogundele OA, Ajibare AO, OLadipo BF, Fakande I. Relationship between depression and quality of life in persons with HIV infection in Nigeria. Int J Psych Med. 2008; 38(1):43-51.

[34] Adeoti AO, Dada MU, Fadare JO. Prevalence of depression and anxiety disorders in people living with HIV/AIDS in a tertiary hospital in southwestern Nigeria. Med Rep Case Stud. 2018; 3(1):150.

[35] Shittu RO, Issa BA, Olanrewaju GT, Mahmoud AO, Odeigah LO, Salami AK, Aderibigbe SA Prevalence and Correlates of depressive disorders among people living with HIV/AIDS, in north central Nigeria. J AIDS Clin Res. 2013; 4:11.1000251.

[36] Lawler K, Mosepele M, Seloilwe E, Ratcliffe S, Steele K, Nthobatsang R et al. Depression among HIV-positive individuals in Botswana: A behavioral surveillance. AIDS Behav. 2011; 15(1):204-8.

[37] Freeman, M., Nkomo, N., Kafaar, Z., & Kelly, K. Mental disorder in people living with HIV/AIDS in South Africa. S Afr J Psych. 2008; 38(3):489–500.

[38] Kinyanda E, Hoskins S, Nakku J, Nawaz S, Patel V. Prevalence and risk factors of major depressive disorder in HIV/AIDS as seen in semi-urban Entebbe district, Uganda. BMC Psychiat. 2011; 11:205.

[39] Ramjee G and Daniels B. Women and HIV in sub-Saharan Africa. AIDS Res Ther. 2013; 10(1):30.