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Prevalence and pattern of depression among HIV positive patients on treatment at the ART clinic of UDUTH, Sokoto, Nigeria

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ABSTRACT

Background: Depression is one of the most frequently observed psychiatric disorder among patients with HIV/AIDS and it has been associated with increased risky behaviors, noncompliance to anti-retroviral treatment, and higher risk for co-morbid survival. **Aim:** This study was conducted to determine the prevalence and pattern of depression among HIV positive patients on treatment at the ART clinic of UDUTH, Sokoto, Nigeria. **Materials and Methods:** This was a cross-sectional study among 419 patients (selected by systematic sampling technique) attending the ART clinic of Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria. A structured interviewer-administered questionnaire was used to collect data on the research variables. Data were analyzed using IBM SPSS version 20 statistical computer software package. **Results**: Two hundred and twenty-seven (54.2%) of the 419 participants were identified as having depression, with 179 (42.7%) having mild depression, 46 (11.0%) having moderate depression, and 1 (0.2%) each having moderately-severe and severe depression. Depression was more prevalent among females (62.9%), those that were unemployed (79.3%), and those who have lived with HIV for 5 years and below (64.5%) as compared to the other groups. Also, depression was less prevalent among those that were married (58.5%) and those who had family support (60.2%) as compared to the other groups. **Conclusion:** This study showed high prevalence of depression among HIV positive patients attending the ART clinic of UDUTH, Sokoto. These findings underscore the need for HIV/AIDS care providers to make screening for depression and implementation of interventions for its prevention the core components of their services.

Keywords: Prevalence, pattern, depression, HIV patients

INTRODUCTION

Human immunodeficiency virus (HIV) is a disease of major public health concern and has recently attracted the attention of psychosocial research (Shanthi et al., 2007). In 2016, about 36.7 million people were estimated to be living with HIV (UNAIDS, 2017). A cause for concern is the emergence of depression (a mood disorder that causes a persistent feeling of sadness and loss of interest) as one of the most frequently observed psychiatric disorder among patients with HIV/AIDS with prevalence rates ranging from 20% to above 70% across the globe.

In addition, depression has been associated with increased risky behaviors, noncompliance to anti-retroviral treatment, and higher risk for co-morbid survival (Berger-Greenstein et al., 2007; Berhe and Bayray, 2013; Rabkin, 2008).

The negative impact of depression on the course of HIV may manifest in maladaptive self-care behaviors such as sexual risk taking, substance abuse and poor adherence to highly active anti-retroviral therapy (HAART) (Shittu et al., 2013). Poor adherence to antiretroviral treatment (ART) regimes results in increased risk of developing viral resistance. In addition, depression keeps people out of the workplace, reduces productivity at school and work, and has tremendous negative effects on the economy (Cassano and Fava, 2002).

HIV-infected patients have to adapt to a set of disease specific factors which often lead to depression such as medical, psychological and social factors, as well as the general threat of death. These patients suffer from shame, stigma, and discrimination, which can also cause mental health problems (Collins et al., 2008; Wingood et al., 2007).

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They tend to adapt maladaptive coping styles; these patients may not recognize or report depressive symptoms, instead they may present with behavioral changes which may indicate the presence of underlying depression (Shanthi et al., 2007). In a meta-analysis, people with HIV seropositivity were found to be twice more likely to be diagnosed with major depressive disorder than those with HIV seronegativity (Shanthi et al., 2007).

In a study in India, the prevalence of depression in patients with HIV under ART was 58.75%. The prevalence of depression increased with the severity of symptoms, being unemployed, uneducated, unmarried, belonging to joint families, did not have or had low family income, migrants, having indifferent or poor relationship with spouse, and having poor social support (Bhatia and Munjal, 2014).

Studies in Africa revealed that in persons living with HIV/AIDS (PLWHA), depression is associated with poorer health status overall, including low weight gain, low CD4 progression (Kingori et al., 2015), suicide (Kinyanda et al., 2012), and also with faster progression to AIDS and increased mortality (Abas et al., 2014). A recent study reported that non-adherent patients had a 3-fold higher risk of presenting with moderate to severe depressive symptoms in comparison to adherent patients (Nel and Kagee, 2013).

The burden of HIV/AIDS continues to increase in Nigeria, current estimates show that about 3.6million people are infected with HIV and the country has the second highest burden of HIV infection in the world (NACA, 2017). In Nigeria, clinical depression has been reported to be the most common mental illness among people living with HIV/AIDS, and with the prevalence ranging from 0-47.8% (Ciesla and Robert, 2001). According to a study by Obadeji et al. (2014) in Ogun state, South-western Nigeria, the prevalence of depression was 23.1% and women accounted for 69.2% of the study population. The prevalence of depressive disorders among people living with HIV/AIDS in North-Central Nigeria was found to be 56.7% (Shittu et al., 2013) with a higher prevalence among females (81.8%) as compared to males (18.2%), thus giving a male: female ratio of 1:4.5.

The factors that have been found to be associated with depression among patients with HIV/AIDS in Nigeria include stigmatization, not belonging to support groups, being female, having suicidal attempt, longer duration of illness, lack of social support, lower education and poor antiretroviral (ARV) adherence, negative self-image, and poor quality of life (Ndu et al., 2011; Chikezie et al., 2013; Obadeji et al., 2014; Sale and Gadanya, 2008; Farley et al., 2011; Onyebuchi-Iwudibia and Brown, 2014; Adewuya et al., 2008).

Depression should be diagnosed and treated in people undergoing treatment for HIV/AIDS in view of its effects on the health and wellbeing of these people. Unfortunately, despite its high prevalence both in the general population and among patients on treatment for HIV/AIDS, depression is commonly under-diagnosed and consequently untreated in general medical practice. In primary care, physicians miss between one half to two-thirds of patients having depression (Bhatia, 2014).

In a study in the United States, Asch et al. (2003) interviewed patients using the Composite International Diagnostic Interview (CIDI) and reviewed their medical records for the previous 2½ years. Of 1,140 patients, 37% had CIDI-defined major depression, and 45% of these did not have a documented diagnosis of depression in their medical records. The researchers concluded that practitioners should be more attentive to diagnosing co-morbid depression in HIV-infected patients.

The problem may be worse in Africa; in a study of psychiatric disorders in HIV-positive individuals in urban Uganda, Petrushkin et al. (2005) found 82.6% total prevalence of psychiatric disorders, and none of them had been assessed for co-morbid psychiatric conditions by their physician, or were receiving mental health treatment. A study conducted in Nigeria (Odejide and Morakinyo, 2003) also found poor recognition of minor psychiatric conditions by general practitioners.

The gross under-diagnosis of depression in patients with HIV/AIDS is believed to be related to the fact that the warning signs of depression are often misinterpreted as an inevitable reaction to being diagnosed with HIV, or as a result of symptoms of HIV disease. For instance, the medical sequelae of HIV infection, its associated opportunistic infections, and the side effects of antiretroviral treatment can mimic symptoms of depression (including fatigue, concentration problems, somatic symptoms, decreased appetite and weight loss); however, from a cognitive-behavioral perspective, these physical symptoms can be part of a cycle of continued depression (Safren et al., 2012).

There is increasing evidence that major depression impacts negatively on the course of HIV infection in Nigeria (Obadeji et al., 2014), yet few studies have looked at the pattern of depression among people living with HIV/AIDS in this environment. This study was conducted to determine the prevalence and pattern of depression among HIV positive patients on treatment at the ART clinic of UDUTH, Sokoto, Nigeria. The findings from the study would be useful to policy makers, human resource managers and caregivers in designing appropriate intervention for addressing the driving forces behind the high burden of depression among patients with HIV/AIDS; this will substantially help to promote optimal patient care and improve treatment outcomes.

MATERIALS AND METHODS

Study Design, Population and Area

A cross-sectional study was conducted among HIV positive patients attending the anti-retroviral therapy (ART) clinic of Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto, Nigeria, in July and August 2017. The hospital is a tertiary healthcare facility with a bed capacity of 850, and consists of 25 clinical departments and units where preventive, curative and rehabilitative services are provided to the inhabitants of Sokoto state, the neighboring states of Kebbi and Zamfara, and the neighboring Niger republic. It is also one of centers designated for treating patients with HIV/AIDS in Sokoto state, Nigeria. All retropositive male and female clients attending the ART clinic who consented to participate were considered eligible for enrolment into the study. Those who were too ill to respond to the questions in the questionnaire and those with a past history of mental illness were excluded.

Sample Size Estimation and Sampling Technique

The sample size was estimated at 419 using the statistical formula for calculating the sample size for descriptive studies (Araoye, 2004), a 57.0% prevalence of depression among HIV patients in a previous study (Shittu et al., 2013), a precision level of 5%, and an anticipated 90% response rate.

The eligible participants were selected by systematic sampling technique using the list of clients attending the clinic during the period of the study to constitute the sampling frame. The clinics are held from Mondays to Fridays, and about 500 clients are seen monthly (i.e., an average of 25 clients are seen on each clinic day). One of 2 patients presenting consecutively at the clinic and meets the eligibility criteria was recruited into the study over a 2 month period until the required sample size of 419 was obtained.

Data Collection and Analysis

A structured interviewer-administered questionnaire was used to obtain information on the respondents' socio-demographic characteristics, while the Patient Health Questionnaire-9 was used to screen the patients for depression. The Patients Health Questionnaire (PHQ-9) is a multipurpose instrument for screening, diagnosing, monitoring and measuring the severity of depression. It is a brief, 9-item, patients self-report depression assessment tool that was derived from the interview-based PRIME-MD (Spitzer, 1999). Psychometric evaluation of the PHQ-9 revealed a sensitivity ranging from 62%-92% and a specificity between 74%-88% (Shittu et al., 2013). The responses to each of the 9 items that assessed depression in the respondents were scored as: not at all (0), several days (1), more than half the days (2), and nearly every day (3). The total depression score was obtained by adding up the scores of the 9 items; this gives a minimum total score of "0" and a maximum total score of "27", based on which depression level was graded as: no depression (1-4), mild (5-9), moderate (10-14), moderately severe (15-19) and severe (20-27) depression (Bernard et al., 2017). Data were analyzed using IBM Statistical Package for the Social Sciences (SPSS) version 20.0 software. Frequency distribution tables were constructed; and cross tabulations were done to examine the relationship between categorical variables. The chi-square test was used to compare differences between proportions. All levels of significance were set at $p < 0.05$.

Ethical Consideration

Institutional ethical clearance was obtained from the Ethical Committee of Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria. Permission to conduct the study was obtained from the Management of the hospital; and informed written consent was also obtained from the participants before questionnaire administration.

RESULTS

Socio-demographic characteristics of respondents

All the 419 questionnaires administered were adequately completed and found suitable for analysis, giving a response rate of 100%. The ages of the respondents ranged from 19 to 65 years (mean = 37.1 ± 10.0 years), with a larger proportion 168 (40.1%) of the 419 respondents in the 30 to 39 years age group. Majority of respondents were females (66.8%), married (74.2%), practiced Islam as religion (79.5%), and had at least

secondary education (77.5%). Majority of respondents (57.0%) have lived with HIV/AIDS for less than 5 years, and most of them (93.6%) reported having family support (Table 1).

Table 1: Socio-demographic characteristics of respondents

Variables	Frequency (%) n = 419
Age groups (years)	
< 20	3 (0.7)
20-29	90 (21.5)
30-39	168 (40.1)
40-49	100 (23.9)
50-59	48 (11.5)
≥60	10 (2.4)
Sex	
Male	139 (33.2)
Female	280 (66.8)
Marital status	
Single	64 (15.3)
Married	311 (74.2)
Separated	1 (0.2)
Divorced	18 (4.3)
Widowed	25 (6.0)
Religion	
Christianity	85 (20.3)
Islam	333 (79.5)
Traditional	1 (0.2)
Level of education	
No formal education	7 (1.7)
Quranic school only	60 (14.3)
Primary	27 (6.4)
Secondary	158 (37.9)
Tertiary	166 (39.6)
Occupation	
None	29 (6.9)
Student	37 (8.8)
Housewife	148 (35.3)
Farmer	12 (2.9)
Civil servant	94 (22.4)
Business	88 (21.0)
Others (artisans)	11 (2.6)
Duration of illness (years)	
0-5	239 (57.0)
6-10	139 (33.2)
11-15	41 (9.8)
Family support	
Present	392 (93.6)
Absent	27 (6.4)

Prevalence of depression among respondents

Two hundred and twenty-seven (54.2%) of the 419 participants were identified as having depression, with 179 (42.7%) having mild depression, 46 (11.0%) having moderate depression, and 1 (0.2%) each having moderately-severe and severe depression (Figure 1).

Pattern of depression among respondents

Variations were observed in the distribution of depression by the respondents' socio-demographic variables. Depression was more prevalent among females (62.9%) as compared to males (59.0%); it was more prevalent among the unemployed (79.3%) as compared to students, housewives and those that were employed; and it was also more prevalent among those who have lived with HIV for 5 years and below (64.5%) as compared to those who have lived with it for 6 years or more. In addition, depression was less prevalent among those that were married (58.5%) as compared to those that were single, separated, divorced and widowed; and it was also less prevalent among those who had family support (60.2%) as compared to those who did not (77.8%). However, the differences observed were not statistically significant ($p > 0.05$) as shown in Table 2.

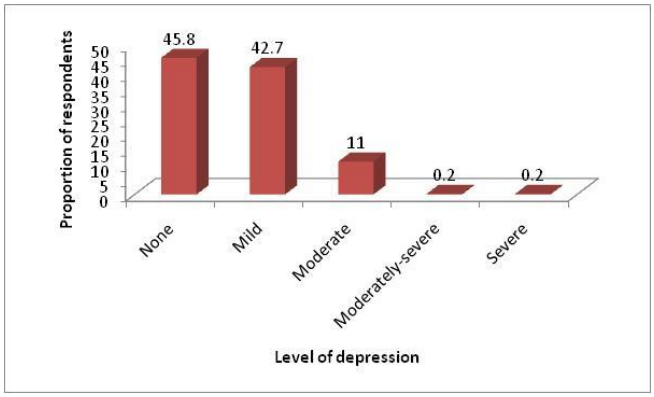

Figure 1: Prevalence of depression among respondents

DISCUSSION

The relatively young population of the respondents in this study with a mean age of 37.07 ± 10.01 years is similar to the finding in a study in South-eastern Nigeria that also reported a mean age of 37.4 ± 9.8 years (Aguocha et al., 2015); this could be related to the fact that heterosexual sex is the main mode of transmission of HIV infection in Nigeria, thus placing the sexually active young populations across the country at very high risk of HIV infection (UNAIDS, 2011).

The preponderance of females (66.8%) as compared to males (33.2%) in this study is in agreement with the findings in a study in Ethiopia (Mohammed, 2017) where 63.2% of the participants were females, and another study in North-central Nigeria (Shittu et al., 2013) where 81.8% of the respondents were females; and it corroborates the documented relatively better health seeking behavior of females as compared to males (Otwombe et al., 2015). The high prevalence of depression among the respondents in this study (54.2%)

Table 2: Pattern of depression among respondents

Variables	Depression status		Test of significance
	Depressed Frequency (%)	Not depressed Frequency (%)	
Age groups (years)			
< 20	1 (33.3)	2 (66.7)	χ^2= 0.496,
20-29	59 (65.6)	31 (34.4)	p = 0.481
30-39	105 (62.9)	2 (37.1)	
40-49	53 (53.0)	47 (47.0)	
50-59	34 (70.8)	14 (29.2)	
≥60	4 (40.0)	6 (60.0)	
Sex			
Male	82 (59.0)	57 (41.0)	χ^2= 6.881,
Female	176 (62.9)	104 (37.1)	p = 0.230
Marital status			
Single	42 (65.6)	22 (34.4)	χ^2= 6.015,
Married	182 (58.5)	129 (41.5)	p = 0.198
Separated	1 (100)	0 (0)	
Divorced	14 (77.7)	4 (22.3)	
Widowed	20 (80.0)	5 (20.0)	
Level of education			
No formal education	6 (85.7)	1 (14.3)	χ^2= 3.553,
Quranic school only	40 (66.7)	20 (33.3)	p = 0.470
Primary	15 (55.6)	12 (44.4)	
Secondary	84 (52.8)	75 (47.2)	
Tertiary	96 (57.8)	70 (42.2)	
Occupation			
None	23 (79.3)	6 (20.7)	χ^2= 8.960,
Student	26 (70.3)	11 (29.7)	p = 0.176
Housewife	96 (64.9)	52 (35.1)	
Farmer	8 (66.7)	4 (33.3)	
Civil servant	53 (56.3)	41 (43.7)	
Business	46 (52.2)	42 (47.8)	
Others (artisans)	6 (54.5)	5 (45.5)	
Duration of illness (years)			
0-5	156 (64.5)	86 (35.5)	χ^2= 2.715,
6-10	82 (58.6)	58 (41.4)	p = 0.257
11-15	19 (51.4)	18 (48.6)	
Family support			
Present	236 (60.2)	156 (39.8)	χ^2= 3.254,
Absent	21 (77.8)	6 (22.2)	p = 0.071

contrasts with the finding in a study in South-eastern Nigeria (Aguocha et al., 2015) where a relatively lower proportion of participants (39.1%) were found to be depressed. This could be due to differences in the socio-economic status of the participants, as majority of the participants in this study were housewives, whereas most (91.9%) of the participants in the other study were gainfully employed. Lower rates of depression have been reported amongst PLWHA in developed countries as compared to developing countries (Tung et al., 2009). Studies conducted in the United States of America majorly reported relatively lower depression prevalence rates ranging from 8.5% to 25.6% (Ownby et al., 2010; Su et al., 2013; Gonzalez et al., 2009). The higher prevalence of depression in developing as compared to developed countries is believed to be related to the higher levels of psychosocial problems and illness burden among PLWHA in the developing countries, such as being blamed for cause of illness, stigmatization, discrimination and social isolation

(UNAIDS, 2015). In addition, the belief that a diagnosis of HIV is tantamount to a death sentence also contributes to the higher levels of depression in the developing countries.

Similar to the higher prevalence of depression among females (62.9%) as compared to males (59.0%) in this study, reports from studies conducted in other places majorly showed higher prevalence of depression in females as compared to males (Bhatia and Munjal, 2014; Mohammed et al., 2015; Aguocha et al., 2015; Eshetu et al., 2015). Generally, women are believed to be more prone to depression, and the gender specific risk factors for common mental disorders that have been found to disproportionately affect women include gender based violence, socioeconomic disadvantage, low income and income inequality, low or subordinate social status and rank, and unremitting responsibility for the care of others (WHO, 2017).

Furthermore, it is believed that the proneness of women to depression could be explained by socio-cultural, psychological and biological factors (Burton, 2017). Socio-culturally, women have to go to work just like men, but they may also be expected to bear the brunt of maintaining a home, bringing up children, and caring for older relatives. Women live longer than men, and extreme old age is often associated with bereavement, loneliness, and poor physical health; and so they invariably develop depression. Psychological explanations include the fact that women are generally more interested in relationships than men. Relationship problems are likely to affect them more, and so they are more likely to develop depression. Biologically, women are much more subjected to fluctuating hormone levels. This is especially the case around the time of childbirth and at the menopause, both of which are associated with an increased risk of developing depression (Burton, 2017).

In this study, the prevalence of depression was higher among respondents that were unemployed as compared to those that were employed. This may be because economic insecurity leads to stress, frustration, dysfunctional family life and feeling of worthlessness. A study by Hutton et al. (2004) found a direct relationship between unemployment and depression in HIV patients. The higher prevalence of depression among respondents with low levels of education as compared to those with higher levels of education in this study is in concordance with the finding in a study by Bhatia and Munjal (2014), and a plausible explanation for this is the fact that those with higher levels of education are more likely to be gainfully employed (as they have the requirements for employment in the formal sector) and be able to meet their daily needs.

The lower prevalence of depression in participants with family support (60.2%) as compared to those without family support (77.8%) in this study is not surprising in view of the warmth and care those with family support receive; these decrease the stress they face, and enable them to have mental, economic and social stability (Nogueira and Bonolo, 2006). These findings highlight the importance of family/social support in the care of patients with HIV/AIDS (as it provides them with practical help and buffers the stresses of living with illness) in addition to providing additional evidence in support of the association established between social support and better treatment adherence, improved clinical outcomes, reduced symptomatology, and the adaptation of beneficial lifestyle activities in previous studies (Strom and Egede, 2013; Miller and DiMatteo, 2013). It is therefore necessary for the Management of hospitals and other HIV/AIDS care providers to establish functional social support groups at their respective facilities.

CONCLUSION

This study showed high prevalence of depression among patients with HIV infection attending the ART clinic of UDUTH, Sokoto; and it was more prevalent among females, the unemployed, those newly infected, those not currently married and those with no family support. These findings underscore the need for HIV/AIDS care providers to make screening for depression and implementation of interventions for its prevention the core components of their services.

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Conflict of interest

None declared.

REFERENCES

Abas M, Ali GC, Nakimuli-Mpungu E, Chibanda D (2014). Depression in people living with HIV in sub-Saharan Africa: time to act. Trop. Med. Int. Health 19: 1392–1396.

Adewuya AO, Afolabi MO, Ola BA, Ogundele OA, Ajibare AO, Oladipo BF (2008). Relationship between depression and quality of life in persons with HIV infection in Nigeria. Int. J. Psych. Med. 38:43-51.

Aguocha CM, Uwakwe RU, Duru CB, Diwe KC, Aguocha JK, Enwere OO, Olose EO (2015). Prevalence and socio-demographic determinants of depression among patients attending HIV/AIDS clinic in a teaching hospital in Imo state, Nigeria. AJMSM 3(6): 106-112.

Araoye MO (2004). Research methodology with statistics for health and social sciences. 2nd Edition. Ilorin, Nigeria: Nathadex Publishers.

Asch SM, Kilbourne AM, Gifford AL, Burnam MA, Turner B, Shapiro MF, Bozzette SAJ (2003). Underdiagnosis of depression in HIV: who are we missing? Gen. Intern. Med. 18(6):450-60.

Berger-Greenstein JA, Cuevas CA, Brady SM, Trezza G, Richardson MA, Keane TM (2007). Major depression in patients with HIV/AIDS and substance abuse. AIDS Patient Care STDS 12:942-55.

Berhe H, Bayray A (2013). Prevalence of depression and associated factors among people living with HIV/AIDS in Tigray, North Ethiopia: A cross-sectional hospital based study. Int. J. Pharm. Sci. Res. 4 (2):761.

Bernard C, Dabis F, de Rekeneire N (2017) Prevalence and factors associated with depression in people living with HIV in sub-Saharan Africa: a systematic review and meta-analysis. PLoS ONE 12(8): 0181960.

Bhatia MS, Munjal S (2014). Prevalence of depression in people living with HIV/AIDS undergoing ART and factors associated with it. J. Clin. Diag. Res. 8(10):1-4.

Burton (2017). 7 Reasons why depression is more common in women. Lawyers with depression. Available at: http://www.lawyerswithdepression.com/articles/7-reasons- depression-common-women. [Last accessed on 2017 Nov 16].

Cassano P, Fava MJ (2002). Depression and public health: an overview. Psychosom. Res. 53(4): 849-57.

Chandra P, Ravi V, Desai A, Subbakrishna DK (1998). Anxiety and depression among HIV- infected heterosexuals—a report from India. J. Psychosom. Res. 45: 401–409.

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

Ciesla JA, Roberts JE (2001). Meta-analysis of the relationship between HIV infection and risk for depressive disorders. Am. J. Psych. 158(5): 725-30.

Collins PY, Elkington KS, von Unger H, Sweetland A, Wright ER, Zybert PA (2008). Relationship of stigma to HIV risk among women with mental illness. Am. J. Orthopsychiatry.78:498–506.

Eshetu DA, Woldeyohannes SM, Kebede MA, Techane GN, Gizachew KD , Tegegne MT, Misganaw BT (2015). Prevalence of depression and associated factors among HIV/AIDS patients attending ART clinic at Debrebirhan referral hospital, North Showa, Amhara Region, Ethiopia. J. Clin. Psych. 9(2):13–25.

Farley J, Miller E, Zamani A, Tepper V, Morris C, Oyegunle M (2010). Screening for hazardous alcohol use and depressive symptomatology among HIV-infected patients in Nigeria: prevalence, predictors, and association with adherence. J. Int. Assoc. Physicians AIDS Care (Chic) 9: 218-26.

Gonzalez J, Hendriksen E, Collins E, Duran R, Safren S (2009). Latinos and HIV/AIDS: examining factors related to disparity and identifying opportunities for psychosocial intervention research. AIDS and Behavior 13: 582-602.

Hutton HE, Lyketsos CG, Zenilman JM, Thompson RE, Erbelding EJ (2004). Depression and HIV risk behaviors among patients in a sexually transmitted disease clinic. Am. J. Psych. 161: 912–14.

Joint United Nations Programme on HIV/AIDs (UNAIDS) (2017). UNAIDS DATA 2017. Geneva, Switzerland, UNAIDS. Available at: https://www.unaids.org/sites/default/files/media_asset/20170720_Data_book_2017_en.pdf [Last accessed on 2018 October 8].

Joint United Nations Programme on HIV/AIDs (UNAIDS) (2011). Global AIDS Response Progress Reporting. Geneva, Switzerland Available at: https://www.unaids.org/en/media/unaids/contentassets/documents/document/2011/JC2215_Global_AIDS_Response_Progress_Reporting_en.pdf [Last accessed on 2018 October 8].

Joint United Nations Programme on HIV/AIDS (UNAIDS) (2015). Global Report: Annexes'. UNAIDS Report on the global AIDS epidemic. Available at: http://aidsinfo.unaids.org [Last accessed on 2017 Nov 18].

Kingori C, Haile ZT, Ngatia P (2015). Depression symptoms, social support and overall health among HIV-positive individuals in Kenya. Int. J. STD AIDS 26: 165–172.

Kinyanda E, Hoskins S, Nakku J, Nawaz S, Patel V (2012). The prevalence and characteristics of suicidality in HIV/AIDS as seen in an African population in Entebbe district, Uganda. BMC Psychiatry 12: 63.

Miller TA, DiMatteo MR (2013). Importance of family/social support and impact on adherence to therapy. Diab. Metab. Syndr. Obes. 6: 421-26.

Mohammed M, Mengistie B, Dessie Y, Godana W (2015). Prevalence of depression and associated factors among HIV patients seeking treatments in ART clinics at Harar town, Eastern Ethiopia. J. AIDS Clin. Res. 6: 474.

National Agency for the Control of AIDS (NACA)(2017). National Strategic Framework on HIV and AIDS 2017-2021. Abuja, Nigeria: NACA. Available at: https://www.childrenandaids.org/sites/default/files/2017-11/NATIONAL-HIV-AND-AIDS-STRATEGIC-FRAMEWORK.pdf [Last accessed on 2018 October 8].

Nel A, Kagee A (2013). The relationship between depression, anxiety and medication adherence among patients receiving antiretroviral treatment in South Africa. AIDS Care 25: 948–955.

Ndu AC, Arinze-Onyia SU, Aguwa E, Obi IE (2011). Prevalence of depression and role of support groups in its management: a study of adult HIV/AIDS patients attending HIV/AIDS clinic in a tertiary health facility in South-Eastern Nigeria. J. Public Health Epidemiol. 3: 182-186.

Nogueira CL, De Fatima Bonolo P (2006). Anxiety and depression assessment prior to initiating antiretroviral treatment in Brazil. AIDS Care.18: 529–536.

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

Odejide O, Morakinyo J (2003). Mental health and primary care in Nigeria. World Psychiatry 2(3): 164–165.

Onyebuchi-Iwudibia O, Brown A (2014). HIV and depression in Eastern Nigeria: the role of HIV-related stigma. AIDS Care. 26: 653-657.

Otwombe K, Dietrich J, Laher F, Hornschwh S, Nkala B, Chimoyi L, Kanda A, Gray GE, Miller CL (2015). Health seeking behaviors by gender among adolescents in Soweto, South Africa. Global Health Action, 8:1, 25670.

Ownby RL, Jacobs RJ, Waldrop-Valverde D (2010). Depression care and prevalence in HIV- positive individuals. Neurobehav. HIV Med. 2: 73-83.

Petrushkin H, Boardman J, Ovuga E (2005). Psychiatric disorders in HIV-positive individuals in urban Uganda. Psychiatric Bulletin 29: 455-458.

Rabkin JG (2008). HIV and depression: 2008 review and update. Curr. HIV/AIDS Rep. 5(4):163-71.

Safren, S A, O'Cleirigh, CM., Bullis JR, Otto MW, Stein MD, Pollack MH (2012). Cognitive behavioral therapy for adherence and depression (CBT-AD) in HIV-infected injection drug users: a randomized controlled trial. J. Consult. Clin. Psychol. 80(3): 404–15.

Sale S, Gadanya M (2008). Prevalence and factors associated with depression in HIV/AIDS patients aged 15–25 years at Aminu Kano Teaching Hospital, Nigeria. J. Child Adoles. Mental Health 20(2): 95-99.

Shanthi AG, Damodharan J, Priya G (2007). Depression and coping: A study on HIV positive men and women. Sri Ramachandra J. Med. 15-19. Available at: https://www.sriramachandra.edu.in/university/pdf/research/journals/nov.2007/book_4.pdf [Last accessed on 2019 Jan 3].

Shittu RO, Issa BA, Olanrewaju GT, Mahmoud AO, Odeigah LO, Salami AK , Aderibigbe SA (2013). Prevalence and correlates of depressive disorders among people living with HIV/AIDS, in North Central Nigeria. J. AIDS Clin. Res. 4: 251.

Spitzer RL, Kroenke K, Williams JB (1999). Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. JAMA 282 (18): 1737–1744.

Su X, Lau JT, Mak W (2013). Prevalence and associated factors of depression among people living with HIV in two cities in China. J. Affective Disorders 149: 108-115.

Strom JL, Egede Le (2013). The impact of social support on outcomes in adult patients with type 2 diabetes: a systematic review. Curr. Diab. Rep. 12(6): 769-81.

Tung MY, Gee ML, Guan NC (2009). Identifying depression among the Human Immunodeficiency Virus (HIV) patients in University Malaya Medical Centre, Kuala Lumpur, Malaysia. ASEAN J. Psychiatry 10: 1-13

Wingood GM, Diclemente RJ, Mikhail I, McCree DH, Davies SL, Hardin JW, Harris Peterson S, Hook EW, Saag M (2007). HIV discrimination and the health of women living with HIV. Women Health 46: 99–112.

World Health Organization (WHO) (2017). Gender and women's mental health. Geneva Switzerland: WHO. Available at: http://www.who.int/mental_health/prevention/genderwomen/en/ [Last accessed on 2017 Nov 25].

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