

## Prevalence of Depression and Anxiety Disorders in People Living with HIV/AIDS in a Tertiary Hospital in South Western Nigeria

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### Abstract

**Background:** In sub-Saharan Africa, HIV/AIDS constitutes a major burden with its attendant mental health related challenges. The aim of this study was to determine the prevalence of depression and anxiety disorder among HIV patients attending a tertiary institution in south western Nigeria.

**Method:** A cross-sectional study conducted among HIV patients attending HIV/AIDS clinic of the Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria. A semi-structured questionnaire was administered to collect socio-demographic characteristics with the incorporation of Hospital anxiety depression questionnaire to assess the prevalence of depression and anxiety in the study and control groups.

**Results:** A total of 424 HIV positive study participants were recruited. A corresponding age and sex matched 429 control subjects were also enrolled. The mean age of HIV positive patients and controls are  $42.2 \pm 9.5$  years and  $43.4 \pm 12.4$  years respectively. There was a female preponderance among both study populations. The prevalence of depression among PLHIV was 39.6% whereas depression was lower in the (22.0%) control group. Likewise anxiety was reported in PLHIV and control group as 32.6% and 28.7% respectively. Female gender, illiteracy, being divorced/widowed, unemployed and low income and low CD4 count were associated with depression while factors associated with anxiety disorder included lower age, female gender, low income, and low CD4 count.

**Conclusion:** The prevalence of depression and anxiety are high in the HIV patients, hence proper integration of mental health care into the HIV programme is inevitable to give patients holistic care.

**Keywords:** Prevalence; Depression; Anxiety; HIV/AIDS; Antiretroviral treatment; PLHIV

### Introduction

HIV/AIDS is a disease of major global concern with significant burden in sub-Saharan Africa. It is globally estimated that 36.7 million people are living with HIV (PLHIV) in 2016, of which 1 million people died of AIDS and 1.8 million new infections in the same year [1]. PLHIV often suffer from depression and anxiety as they adjust to the impact of the diagnosis and face the difficulties of living with a chronic life-threatening illness, of which cure is yet to be discovered [2].

Depression is the commonest psychiatric syndrome reported in PLHIV, however, the majority of the patients with depressive symptoms also had prominent anxiety symptoms and fulfilled the ICD-10 criteria for generalized anxiety disorder [3]. Adjustment disorder is the most common psychiatric disorder that manifests as anxiety, and is common after receiving an HIV diagnosis. Anxiety disorders are a serious concern for PLHIV with poor coping strategies and social support network, such as family, friends, or a faith community [4]. The prevalence of depressive illness among PLHIV on antiretroviral therapy in sub-Saharan Africa is estimated to range from 29 to 63.1% [5-9].

The prevalence of anxiety disorders among PLHIV as reported in another study in Nigeria was 21.7% while mixed anxiety and depression was 5.3% [10]. However, the overall prevalence of psychiatric disorders was reported to be as high as 59.1% among PLHIV [11].

Various risk factors for developing these psychiatric disorders among these patients have been reported in Africa and these include low income, perceived stigma of the infection, poor level of social support, stage of the disease, unemployment, being unmarried, females, low level of formal education and comorbid opportunistic infections [8-11]. These comorbid states have dual relationships with HIV/AIDS which could affect patients' adherence to antiretroviral drugs, quality of life and life expectancy [11,12].

There is however paucity of data on the burden of mental health problems among PLHIV in Nigeria and no studies investigating this key aspect in the management of PLHIV in Ekiti State. Most of the available studies focused only on depressive illness, others had no control group and relatively small sample size [10,11]. Hence, this study aimed at determining the prevalence of depression and anxiety among PLHIV comparing the findings with age and sex matched control who are HIV sero-negative patients.

## Materials and Methods

### Study design

A Hospital based cross-sectional study which was conducted among patients accessing care for HIV infection in Ekiti State University Teaching Hospital (EKSUTH). The hospital is located in Ado-Ekiti, Ekiti state situated in the south western region of Nigeria. Ekiti state is located within 7° 40' N 5° 15' E with an estimated population of 2,384,212 as at 2006 population census [13].

### Study population

Adult HIV patients on follow up who were diagnosed of this infection and have been on treatment for at least 6 months were recruited for the study. The HIV patients receive treatment at the Medical Outpatient Department where specialists in HIV medicine regularly attend to them like other medical cases. Critically ill patients and non-consenting individuals were excluded from the study. Another group of HIV negative who consented to HIV screening, attending the General Outpatient Department (GOPD) served as control were age and sex matched [14].

### Sampling size calculation

The sample size was calculated using the online statistical software from Raosoft Incorporated. The estimated sample size was 327 from a population of 2150 HIV patients in our facility, using 50% as response distribution. Twenty percent of the calculated sample size was added to account for incompletely filled questionnaires thereby making a total of 392. We further increased this number to 424 to increase the power of the study.

### Survey instrument

A pretested semi-structured questionnaire was administered by two research assistants who obtained information on socio-demographic profile, stigmatization, suicidal ideation, medication use, HIV screening results. In addition, the Hospital Anxiety Depression scale was used to assess the prevalence of this condition. The same instrument was administered to an unexposed age and sex matched group, who were HIV negative, who presented at the general outpatient department for treatment. The HADS consists of 14 items; the anxiety (HADS-A) and depression (HADS-D) subscales each include 7 items. It has been validated for use as a screening tool for

depression and anxiety disorders in general medical outpatient clinics and widely used in clinical practice and research [15,16].

### Statistical analysis

Obtained data were analysed using SPSS statistical software version 20 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were initially used to explore the data and to present results of prevalence and socio-demographic data. Categorical variables were expressed in proportions while continuous variables in mean (standard deviation). A comparison of categorical variables was done using Pearson's Chi-square test while student's t-test was used for comparing continuous variables. A p-value of less than 0.05 was considered statistically significant.

### Ethical considerations

Ethical approval to conduct the study was obtained from the institution's ethics and research committee. Informed verbal and written consent was obtained from every participant and they were ensured of the anonymity and confidentiality by assigning numerical codes to each questionnaire. HIV/AIDS patients found to have depression and anxiety were referred to the psychiatrist's clinic for further evaluation.

## Results

### Sociodemographic characteristics

A total of 424 HIV positive patients were recruited with a corresponding age and sex matched control group of 429 HIV negative patients. The mean age of the HIV positive patients was 42.2 ± 9.5 years while the control group was 43.4 ± 12.4 years. There was a female preponderance in both the exposed and control groups as the male to female ratios were 1 to 2.8 and 1 to 1.8 respectively. A major percentage (76.2%) of HIV positive patients were married and likewise (68.1%) in the control group. More than half of the respondents in both the HIV positive and control were self-employed (61.1% and 50.1% respectively).

Almost two thirds (63.4%) of the HIV positive patients had a monthly income less than 140 dollars while just about half (52.4%) of the control group had a monthly income less than 140 dollars. Only 16.9% and 14.2% of the HIV positive patients and control group respectively had no formal education as shown in Table 1.

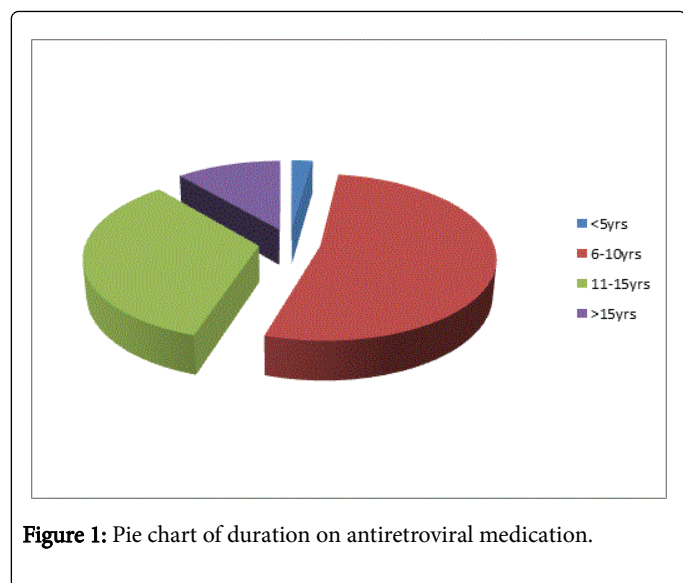
| Variable              | HIV n (%)   | Control n (%) | Test/chi <sup>2</sup>    | p-value  |
|-----------------------|-------------|---------------|--------------------------|----------|
| Age (mean ± SD)       | 42.16±9.537 | 43.37±12.380  | t=-1.598                 | 0.11     |
| <b>Sex</b>            |             |               |                          |          |
| Male                  | 111 (26.2)  | 154 (35.9)    | chi <sup>2</sup> =0.347  | 0.556    |
| Female                | 313 (73.8)  | 275 (64.1)    |                          |          |
| <b>Marital status</b> |             |               |                          |          |
| Single                | 45 (10.6)   | 90 (21)       | chi <sup>2</sup> =22.352 | < 0.0001 |
| Married               | 323 (76.2)  | 292 (68.1)    |                          |          |
| Divorce               | 28 (5.9)    | 11 (2.6)      |                          |          |

|                                        |            |            |                          |         |
|----------------------------------------|------------|------------|--------------------------|---------|
| Widow (er)                             | 31 (7.3)   | 36 (8.4)   |                          |         |
| <b>Occupation</b>                      |            |            |                          |         |
| Civil servant                          | 131 (30.9) | 129 (30.1) | chi <sup>2</sup> =30.859 | <0.0001 |
| Retired                                | 7 (1.7)    | 38 (8.9)   |                          |         |
| unemployed                             | 27 (6.4)   | 47 (11.0)  |                          |         |
| Self employed                          | 259 (61.1) | 215 (50.1) |                          |         |
| <b>Education</b>                       |            |            |                          |         |
| Primary                                | 68 (16.0)  | 60 (14.0)  | chi <sup>2</sup> =15.116 | 0.002   |
| Secondary                              | 144 (34.0) | 105 (24.5) |                          |         |
| Tertiary                               | 197 (46.5) | 252 (58.7) |                          |         |
| None                                   | 4 (0.9)    | 1 (0.2)    |                          |         |
| <b>Average monthly income</b>          |            |            |                          |         |
| <140 dollars                           | 269 (63.4) | 225 (52.4) | chi <sup>2</sup> =8.887  | 0.012   |
| 140-280 dollars                        | 86 (20.3)  | 77 (17.9)  |                          |         |
| >280 dollars                           | 12 (2.8)   | 28 (6.5)   |                          |         |
| Exchange rate at 357 naira to 1 dollar |            |            |                          |         |

**Table 1:** The sociodemographic characteristics of the study and control groups.

**Clinical characteristics**

Most (70.3%) of the HIV positive patients are currently on antiretroviral (TDF+3TC+EFV) medication combination. More than half of the HIV seropositive patients had been on the antiretroviral medications for a period of 6 to 10 years. However, very few of the respondents were on antiretroviral medications for 5 years and below as shown in Figure 1.



**Figure 1:** Pie chart of duration on antiretroviral medication.

The median CD4 count of the patients at diagnosis was 224.0 cells/ul with interquartile range (IQR) of 110.5 to 400 cells/ul. A remarkable increase in median current CD4 count to 405.0 cells/ul (IQR 266.0 to 575 cells/ul) was observed and with a median viral load of 42.0 (IQR 20.0 to 555.0).

About a third of the exposed group was unaware of their spouses' HIV status and among those that knew, 79.8% of them had HIV negative partners. Serodiscordant couples constituted a major percent (79.8%) of the married respondents while seroconcordant couples were 20.2%.

**Psychiatric morbidity**

The prevalence of depression among the HIV positive patients and control group was 39.6% and 22.0% respectively (p<0.001). However, the prevalence of anxiety disorder was 32.6% and 28.7% among the exposed and control groups respectively (p> 0.219). The co-existence of both anxiety and depression in HIV positive patients and control was 21.9% and 14.5% respectively as shown in Table 2.

More of cases of depression were reported in females (42.5% of females compared to 31.5% of males) (CI=0.009-0.132). Married HIV positive patients had the least proportion (37.2%) of depression whereas the highest proportion of depression was found among widows (58.1%) followed by divorced patients (48.0%). These differences were found to be significant with p value of 0.03.

| Variable               | Depression Test          | p value | Anxiety Test            | p value |
|------------------------|--------------------------|---------|-------------------------|---------|
| Age                    | T test=-0.769            | 0.442   | T test=1.972            | 0.049*  |
| Sex                    | Chi <sup>2</sup> =4.115  | 0.043*  | Chi <sup>2</sup> =6.986 | 0.008*  |
| Marital status         | Chi <sup>2</sup> =5.986  | 0.03*   | Chi <sup>2</sup> =1.001 | 0.801   |
| Educational level      | Chi <sup>2</sup> =13.710 | 0.003*  | Chi <sup>2</sup> =1.150 | 0.765   |
| Occupation             | Chi <sup>2</sup> =13.768 | 0.003*  | Chi <sup>2</sup> =2.663 | 0.446   |
| Income                 | Chi <sup>2</sup> =8.101  | 0.017*  | Chi <sup>2</sup> =6.205 | 0.045*  |
| Known HIV of partner   | Chi <sup>2</sup> =13.981 | 0.001*  | Chi <sup>2</sup> =0.283 | 0.595   |
| HIV status of partner  | Chi <sup>2</sup> =2.168  | 0.338   | Chi <sup>2</sup> =5.180 | 0.075   |
| Comorbidity            | Chi <sup>2</sup> =9.000  | 0.061   | Chi <sup>2</sup> =9.000 | 0.061   |
| Viral load             | Corr coef=0.004          | 0.955   | Corr coef=-0.065        | 0.372   |
| CD4 COUNT at diagnosis | Corr coef=0.044          | 0.383   | Corr coef=-0.55         | 0.275   |
| Current CD4 count      | Corr coef=-0.166         | 0.001*  | Corr coef=-0.102        | 0.043*  |

**Table 2:** Factors associated with depression and anxiety disorder.

Almost all the retired HIV positive patients (71.4%) had depression as opposed to those who were still gainfully employed (p value=0.003). Similarly, HIV infected patients without formal education and only primary education had high rates of depression (100.0% and 51.5% respectively) (p value=0.003).

Depression was also associated with lower socioeconomic class (less than \$140/month) as assessed with monthly income with p value=0.017, insomnia (p<0.0001), low current CD4 count (p value=0.001), unaware of spouses' HIV status (P<0.001) and having thoughts of suicide (p<0.0001).

In contrast, female sex (P value<0.008), lower age of respondents (P value<0.049), presence of insomnia (P value<0.0001), low income (P value <0.045), and low current CD4 count (P value<0.043) were significantly associated with anxiety disorder among HIV positive patients in this study.

## Discussion

This study found a higher prevalence of depression and anxiety disorders among HIV patients compared to the controls as well as a higher prevalence of comorbid occurrence of both conditions in HIV patients.

Previous studies have reported similar prevalence of 29.0% and 40.0% for depression and 21.7% for anxiety disorders among HIV patients [6,7,10]. However prevalence as high as 63% and 77.1% has been reported among HIV patients in other studies [9,16]. This calls for a proper integration of mental health services in HIV care so as to address the prevailing psychosocial needs of PLHIV as they adapt to the challenge of living with a chronic and at the moment incurable disease.

Similarly, we found a higher prevalence rate of 21.9% for comorbid anxiety and depression in this study among HIV positive patients compared to a rate of 14.5% among the controls. The prevalence rate among the HIV positive patients was far higher than a prevalence rate

of 5.3% reported in another study in this environment [10]. However, similar prevalence has been reported in another study [8]. The differences in the various prevalent rates may be due to the different diagnostic tools, sample size variations and different locations of the study.

In this study, depression and anxiety were more common among females. This was also reported by other researchers [8,9,17,18]. Marriage as observed in this study appeared to be protective against depression but not against anxiety disorder, as fewer proportion of married HIV positive patients had depression compared to those who were divorced or widowed. Similar studies have also reported that being unmarried or divorced were risk factors for psychiatric morbidity among HIV patients [8,10]. Possible reasons for the high rate especially among divorced respondents include low self-confidence and possible financial problems [19]. Furthermore, the loss of a close confidant and possibly poor social support system could be responsible for the level of depression among the widowed and divorced. On the contrary, Elbadawi et al. reported high psychiatric morbidity in married HIV patients [9].

The emotional burden associated with low income could be responsible for the reported depression and anxiety in our study. Most of the respondents earned less than two dollar per day and they could be faced with the challenge of meeting financial obligations [20].

Illiteracy was another factor found to be associated with depression but not anxiety disorder. Other studies have also reported similar findings [9,21]. Our study found that the unemployed and retired patients had the highest rate of depression. This was collaborated by other studies who reported that unemployment was a risk factor for psychiatric morbidity among HIV patients [10,22].

This study found that lower age of respondents was a possible risk factor for anxiety disorder but not for depression. Younger age as a risk factor for psychiatric morbidity was also reported by other researchers [10,22]. The current CD4 count as opposed to the CD4 count at diagnosis was inversely correlated with depression and anxiety. Other

studies have also reported that low CD4 count was a risk factor psychiatric morbidity [22-24]. This may be because patients with lower CD4 count are probably having more symptoms of HIV infection and consequently more emotional and physical disability. The high rate of depression among patients who do not know the HIV status of their spouses may be due to the constant worrying of these patients about their infection and perceived consequences of informing their partners about their HIV status [25].

Our study has some limitations as depressive and anxiety disorders often change with time, hence a snapshot analysis might not give exact degree of the condition. However, the advantage of a non-exposed control group helped assess the extent in the general population.

## Conclusion

The prevalence of depression and anxiety is high among PLHIV and could present in a subtle manner. A routine screening for depressive and anxiety symptoms is recommended with a proper integration of mental health services into HIV care to give a comprehensive management to all HIV patients.

## Conflicts of Interest

The authors declare no competing interests.

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