Original Article

The Impact of Comorbid Clinical Depression on The Health-Related Quality of Life of Adults on Highly Active Antiretroviral Therapy in Maiduguri, Northeastern Nigeria

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ABSTRACT

Background: Globally, depression compromises the quality of life (QOL) of people suffering from it. We assessed the impact of comorbid depression on the health-related quality of life (HRQOL) of adults on highly active antiretroviral therapy (HAART) in northeastern Nigeria in this study. **Materials and Methods:** Three hundred and three adults on HAART were recruited for this study from the ART clinic of the University of Maiduguri Teaching Hospital in northeastern Nigeria. The depressive disorder module of the Composite international diagnostic interview (CIDI version 3.0) and the WHO quality of life instrument (WHOQOL-BREF) were used for the evaluation of depression and quality of life respectively. **Results:** The prevalence of depression in this study was 19.8%. The depressed respondents rated their HRQOL poorer than their nondepressed counterparts on the physical, psychological, social relationships and environmental domains as well as the global outcome, as shown by these statistically significant findings ($T = 9.739$, $P = <0.001$), ($T = 8.972$, $P = <0.001$), ($T = 6.533$, $P = <0.001$), ($T = 8.913$, $P = <0.001$), and ($T = 10.018$, $P = <0.001$), respectively. Female gender, CD4 counts $<200/mm^3$ and diagnosis of depression were significant predictors poor QOL. **Conclusion:** Depression has a negative impact on the QOL of the respondents. We therefore recommend incorporation of the routine screening of this important psychiatric comorbidity into the care of this vulnerable group in order to optimize patient care.

Key words: *Comorbid depression, highly active antiretroviral therapy (HAART), northeastern Nigeria*

INTRODUCTION

Depression is a common psychiatric condition that

affects mood and causes significant distress and impairment in the level of functioning, with variable lifetime prevalence between 3% and 17% and 1-year point prevalence of 10% in the general population.[1-4] It accounts for 4.4% of the total disability-adjusted life years (DALYs) and for about 12% of the years lived with disability (YLD), thus, making it the fourth leading contributor to the global burden of disease and the largest contributor of nonfatal disease burden globally according to the WHO in the year 2000.[5] Depression has been shown to be a common comorbid condition in many chronic disorders including HIV

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infection whose status has changed from a rapidly fatal disease to a chronic one due to the introduction of the antiretroviral drugs.[6-12]

The prevalence of depression in HIV infected clinic populations varies widely from 22% in the United States, 28.7% in Nigeria, 38.7% in South Africa, and up to 54.3% in Uganda.[13-16] Several social, clinical, and methodological factors such as socioeconomic status, progression of the HIV disease, similarities between the somatic symptoms of HIV infection and depression, as well as sample size have been attributed to this variation. A meta-analysis of data from ten studies that examined the prevalence of depression among HIV seropositive individuals conducted by Ciesla *et al.* revealed a two-fold increase in the prevalence of depression when compared with the HIV-negative individuals.[17] Research has also shown that depression in people living with HIV (PLHIV) may be responsible for additional illness burden, reduction of adherence to the ARVs and thus acceleration of progression to AIDS illness as well as reduction in the quality of life of the patients.[18-22]

The World Health Organization has defined Quality of Life as individuals' perception of their position in life in the context of the culture and the value systems in which they live and in relation to their goals, expectations, standards, and concerns.[23] This concept has evolved to become one of the major goals in studies regarding the Human Immunodeficiency Virus (HIV) infection, because, due to advances in the treatment with the use of antiretroviral drugs, there has been a decrease in opportunistic infections, and an increase in the overall survival rate of people living with the virus. Quality of life studies among people living with HIV/AIDS indicate that it is affected by many individual, social, cultural, and emotional factors, related mainly to the impact of the diagnosis and the distress of living with a 'stigmatizing illness' most especially in the African context where the disease is perceived by many to be contracted solely through 'immoral means'. Different variables, such as gender, living and health conditions, have been evaluated for their relationship with the quality of life of patients with HIV infection with variable outcomes; however, depression has been reported more consistently to have significant effect on the different dimensions of their health-related quality of life.[14,20,24]

Results from different research in patients with HIV infection and the general population have consistently shown that mood disorders particularly depression, have a substantial negative impact on the quality of life of the sufferers.[14,20,24,25] In a study, to assess the impact of comorbid psychiatric conditions on the health-related quality of life of HIV+ subjects receiving medical care in the United States, a national probability sample of the subjects was recruited in which the participants were screened for psychiatric conditions with the CIDI and the HRQOL was rated with a 28-item instrument. It revealed that 36% of the subjects screened positive for current depression and 26% were positive for dysthymia. Furthermore, the participants with a probable diagnosis of mood disorder had significantly worse functioning and well-being than those without a mood disorder diagnosis on all the HRQOL dimensions including the physical and mental health composites.[26] Another study found lower QOL among participants who were depressed and were also receiving highly active antiretroviral therapy (HAART) and that identifying and treating depression in the subjects improved their HRQOL.[27]

On the African continent, Hughes *et al.*, in 2004, conducted a study in South Africa that compared the QOL in HIV-seropositive and HIV-seronegative subjects and they found poorer QOL among the seropositive subjects.[21] In Nigeria, Adewuya *et al.* found a significant correlation between the diagnoses of depression with poorer QOL in all the quality of life domains except the social relationship domain. Lower educational level, poor social support, and comorbid medical problems were also associated with poorer QOL in that study.[14] Other studies done in Nigeria on the same subject matter included those of Ogbuji *et al.* in the Southwestern and that of Olisah *et al.* in the northwestern regions of the country that had almost similar outcomes.[22,25]

According to the last HIV Seroprevalence Sentinel Survey conducted in Nigeria, 4.1% of the country's over 150 million people are living with HIV-infection, thus, the country is currently rated third highest worldwide in terms of the concentration of people living with the virus just after South Africa and India.[28] In Nigeria, despite the increase in major HIV/AIDS initiatives at the national level, there are still a lot of shortcomings and barriers in terms of provision and access to HIV-related services. The UNAIDS reported in 2007 that only 26% of those in need of antiretroviral therapy in the country had access to the treatment regime and the situation has not significantly changed since then.[29] Furthermore, where the HIV/AIDS treatment program are available, there is the virtual absence of mental health services and as such only a small proportion of people living with HIV/AIDS on HAART may receive the requisite mental health care. The future in Nigeria is still bleak despite the fact that it has been proven that integrating psychiatric and psychosocial interventions are of immense benefit to both the mental and the physical health of people living with HIV.[30]

The aims of study were (1) to compare the quality of life of people living with HIV/AIDS on antiretroviral therapy with and without comorbid clinical depression and (2) to determine the sociodemographic and clinical predictors of poor QOL among the subjects.

MATERIALS AND METHODS

Study settings and population

This was a cross-sectional study conducted at the outpatient antiretroviral therapy (ART) clinic of the University of Maiduguri Teaching Hospital (UMTH) in Northeastern Nigeria. At the time of data collection, the ART clinic had 5,574 registered patients with 3,594 of them already placed on treatment with the highly active antiretroviral therapy (HAART) regime.[31]

The study population consisted of adults who were on HAART and who have given their consent to participate. Those on HAART must have fulfilled one of the criteria for placement on ART as stipulated by the Nigerian guidelines which include (1) WHO Stage IV disease irrespective of the CD4 cell count, (2) WHO Stage III disease with CD4 cell count below 350/mm³, and (3) WHO Stage I or II disease with CD4 cell count of less than or equal to 200/mm³.[32] The exclusion criteria include: Those below 18 years of age, those with marked cognitive impairment, those with comorbid chronic or severe physical illnesses capable of impairing their response, and nonconsenting adults. To determine whether the potential respondents were eligible for the study or not on the grounds of cognitive impairment, all the participants were screened by a single investigator by carrying out a basic cognitive functioning assessment. Thus, the patients were assessed for orientation in time, place and person, attention and concentration, as well as the immediate, recent, and remote memories. Based on the outcome of this clinical test alone, those respondents found to have impairment on any of these cognitive domains were excluded. The study enrolled a representative sample of 350 adults who were already on HAART and the systematic random sampling technique (*n*th sampling) was adopted with a sampling ratio of 1:10. Therefore, the sampling interval was every other tenth patient until the total number of 350 patients was reached. The list of all patients in the clinic constituted the sampling frame and the starting point on the list was chosen at random using the random number tables.

Ethical consideration

Ethical clearance was obtained from the ethical review board of the University of Maiduguri Teaching Hospital. Written informed consent was also obtained from the study participants. In order to ensure confidentiality, codes were used for data entry and analysis.

Measurements

The Enzyme Linked Immunosorbent Assay (ELISA) technique was used for the diagnosis of HIV. For positive results, confirmation was done using the STAT-PAK test (Chembio diagnostic system Inc, 2008, USA) as part of the hospital's policy.

An anonymous sociodemographic questionnaire designed by the author soliciting for the age, sex, and occupational status of the respondents using the social class stratification by Borofka and Olatawura was used. This system classified individuals based on their occupations into: social class I, (which consists of highly skilled professionals like Doctors, Lawyers, business executives, etc), social class II (which consists of intermediate skilled professionals like, Technicians, nurses, etc), social class III (which consists of low skilled respondents like junior clerks, drivers, mechanics, junior military and police personnel), social class IV (which consists of unskilled respondents like petty traders, subsistent farmers, messengers, etc), and social class V (which consists of unemployed respondents).[33] Other critical sociodemographic information such as marital status and years of education were also incorporated into the questionnaire.

Basic clinical information such as the CD4 counts and the CDC staging of the disease were obtained from the respondents' medical records.

Clinical depression was assessed using the Hausa version of the depressive disorder module of the Composite International Diagnostic Interview (CIDI) used during the World mental health survey in Nigeria. Three of the investigators in this study were trained as project supervisors by the Ibadan centre of the African Regional Office (AFRO) of the WHO in 2004 for the world mental health survey initiative and were granted the permission to use the instrument by the centre. It was designed with the property of generating diagnosis according to both the International Classification of Diseases 10th Revision (ICD 10) of the World Health Organization and the Diagnostic and Statistical Manual 4th Edition (DSM IV) of the American Psychiatric Association.[34,35] The interviews of CIDI are presented in a modular form thus permitting the selective investigation of a diagnosis of interest to the exclusion of other diagnostic groups. Apart from the English version, this instrument has also been presented in different languages including Taiwanese, German, Afrikaans, and Yoruba, etc, and have all been demonstrated to have excellent psychometric properties.[4,36,37] Diagnosis of depression was made by the author using the ICD-10 criteria by matching the symptoms generated by CIDI with the ICD-10 diagnostic criteria. Independent studies conducted by different authors comparing the

degree of concordance between the depressive module of the CIDI and clinician's diagnosis of depression using either the DSM-IV or the ICD-10 criteria have consistently shown acceptable degrees of concordance with Kappa values (K) in the range of 0.71 to 0.93 across different samples thus making it a valid module for the detection of depression in both clinical and nonclinical samples.[36,37]

Data on Quality of Life were collected using the World Health Organization Quality of Life BREF (WHOQOL-BREF) Scale. The WHOQOL-BREF is a shorter version of the original WHOQOL-100 and consists of 26-items that are scored over four major domains, namely: physical, psychological, social relationships, and environment.[38] The responses of the WHOQOL-BREF are scored in a Likert scale fashion from 1 to 5, with higher scores denoting higher Quality of Life and vice versa. The WHOQOL-BREF was chosen for this study because it contains domains of life function critical to HRQOL, and as a generic scale, provides information that is comparable across patient groups and populations with different languages and culture. In addition, because of its brevity, it takes a relatively shorter time to administer (about 6 min in this study) that makes it appropriate for use in busy clinics as obtained in the setting of this study. However, the potential disadvantage is that the WHOQOL-BREF may not focus on areas of importance to a particular patient population (which in this case, were the patients living with HIV); hence, specific instrument like the WHOQOL-HIV would have been more appropriate. The raw domain scores were then converted to their actual values using the transformation equations as propounded by the WHOQOL group. The global score was then calculated by summing all the items scored without regards to the domains. For the interpretation of the individual domain scores, the scores were classified as 'fair' if they fall within the mean score ±1 standard deviation. Values below these were regarded as 'poor' while values above these were regarded as 'good' as earlier done by Olusina and Ohaeri.[39]

The WHOQOL-BREF used in this study was translated to Hausa, the local language that is understood by majority of the respondents. This was done by a psychiatrist and a linguist. Precise semantic and idiomatic equivalents were considered as far as possible. The back translation, which was performed independently by another set of psychiatrist and linguist, was compared to the original copy and found to be satisfactory. The copyright permission to translate and use this instrument was obtained from the WHO. The Amharic, Persian, Hindi, and Taiwanese versions of this instrument have also been used in previous studies and have all been shown to have excellent psychometric properties.[40-43]

All the instruments were administered to the respondents by resident doctors in their third year of the residency programme through face to face interview. As part of the preparation for the study, the interviewers were all trained on the use of the CIDI and the WHOQOL-BREF as well as their scoring systems and have all been certified to possess high proficiency levels. The interviews were conducted with utmost confidentiality with each of the respondents seen separately in a private room where the questionnaires were administered.

Statistical analyses

The data were analysed using SPSS version 16.0. The prevalence of depression was assessed using descriptive statistics. Participants were classified either as depressed or nondepressed based on their CIDI-ICD-10 diagnosis. Chi square (χ^2) was used for qualitative variables with Yates correction and Fischer's exact probability applied where necessary, while t-test was used for quantitative variables.

For the purpose of statistical analysis of the Quality of Life variables of the respondents, those whose QOL scores were within the range of 'fair' and 'good' outcomes were categorized together and labelled 'good' while those with poor outcome were categorized separately and labelled 'poor'. The reason for the merger of the 'fair' and 'good' subcategories into a single 'good' category during data analysis was because some of the cells in the resulting table of QOL categorization (for both participants with and without depressive disorder) had values which were less than 5 in the good categories. Hence, this was done to facilitate the computation of the chi-square test during analysis.

To assess the predictors of QOL (poor versus good), bivariate analysis was conducted on all sociodemographic and clinical variables and step-wise logistic regression was subsequently performed on variables that were found to be statistically significant in order to determine the independent predictors/determinants of QOL. Significance was computed at $P \leq 0.05$, two tailed.

RESULTS

Of the 350 patients who were recruited for the study, the data of only 303 respondents (86.6%) were finally analyzed. The data of the 47 patients that were not analyzed included those who declined to give informed consent ($n = 17$), those with comorbid debilitating physical illnesses and severe cognitive impairment that affected their response ($n = 11$) and those whose questionnaires could not be analyzed due to missing data ($n = 19$).

Prevalence of depression and the sociodemographic profile of the respondents

Of the 303 HIV positive subjects, sixty (60) representing 19.8% of the respondents met the ICD-10 Diagnostic criteria for Depression as diagnosed by the CIDI. Out of the 303 patients on antiretroviral therapy, 164 (54.1%) were males and 139 (45.9%) were females. The ages of the respondents ranged from 18 to 54 years with a mean age of 35 years (SD ± 8.20). Majority of the patients, 61.7%, were less than 38 years of age. Seventy Six representing 25.1% had formal education and 40.6% of the patients were married. One hundred and ninety five representing 64.36% of the HIV+ respondents on HAART therapy belong to social classes IV and V.

The association between the sociodemographic and clinical variables included in this study and the diagnosis of clinical depression revealed that only female gender ($P < 0.001$) was found to be statistically significant. These findings are illustrated in Table 1.

Internal consistency and interdomain correlations of the WHOQOL-BREF

To measure the internal consistency, the Cronbach's alpha was calculated for each of the domains of the instrument. Most of the domains of the Hausa version of the WHOQOL-BREF had a high value of Cronbach's alpha ($\alpha = 0.7$). However, the social relationship domain had a lower internal consistency ($\alpha = 0.58$) as compared to the other domains [Table 2]. Further analysis of the interdomain correlations showed that there were statistically significant associations between the domains [Table 3].

Quality of life outcomes of the retroviral positive respondents

After controlling for potential confounding variables such as age, sex, occupation, and CD4 lymphocyte count, with staging and social support, HIV+ patients with comorbid depression had lower mean scores in all the domains as well as the global outcome indicating poor QOL. The QOL scores of the depressed and the nondepressed respondents in the various domains and the global outcome are presented in Table 4. On the physical and psychological domains, the depressed respondents rated their physical and psychological wellbeing poorer than their nondepressed counterparts and the findings were statistically significant ($t = 9.739$, $P = <0.001$) and ($t = 8.972, P = <0.001$), respectively. The outcomes were similar in the social relationship and the environmental domains, where the depressed respondents had poorer outcomes when compared to the nondepressed respondents and both findings were statistically significant ($t = 6.553$, $P = <0.001$) and ($t = 8.913, P = <0.001$), respectively. Finally, for the

global Quality of Life outcome, the depressed patients also fared poorer than their nondepressed counterparts and this finding was also statistically significant ($t = 10.018, P = <0.001$).

Predictors of the quality of life

After subjecting all the sociodemographic and clinical variables to bivariate analysis, only female gender, CD4 cell count $<200/mm^3$ and the diagnosis of depression

Table 1: Sociodemographic and clinical characteristics of the respondents at the ART clinic of UMTH in Maiduguri, northeast Nigeria

Variable value	Depressed freq (%)	Nondepressed freq (%)	Total freq (%)	χ^2	*P*-value
Age (years)					
18-37	42 (70.0)	145 (59.7)	187 (61.7)	2.17	0.14
38-57	18 (30.0)	98 (40.3)	116 (38.3)		
Gender					
Female	43 (71.7)	96 (39.5)	139 (45.9)	20.04	0.001**
Male	17 (28.3)	147 (60.5)	164 (54.I)		
Occupation					
Class I	5 (8.3)	21 (8.6)	26 (8.6)	4.32	0.36
Class II	5 (8.3)	36 (14.8)	41 (13.5)		
Class III	5 (8.3)	36 (14.8)	41 (13.5)		
Class IV	25 (41.7)	82 (33.8)	107 (35.3)		
Class V	20 (33.4)	68 (28.0)	88 (29.1)		
Marital status					
Not married	35 (58.3)	145 (59.7)	180 (59.4)	0.36	0.85
Married	25 (41.7)	98 (40.3)	123 (40.6)		
Education					
Literate	12 (20.0)	64 (26.3)	76 (25.1)	1.03	0.31
Non-literate	48 (80.0)	179 (73.7)	227 (74.9)		
CD4 cell count					
Less than200	15 (25.0)	71 (29.2)	86 (28.4)	0.42	0.52
≥200	45 (75.0)	172 (70.8)	217 (71.6)		
CDC staging					
Stage II	1 (1.7)	20 (9.5)	21 (6.9)	5.47	0.07
Stage III	30 (50.0)	137 (13.3)	167 (55.1)		
Stage IV	29 (48.3)	86 (13.6)	115 (38.0)		

**Statistically significant findings

Table 2: Internal consistency of the Hausa version of the WHOQOL-BREF questionnaire

Domain	Coefficient of internal consistency (Cronbach's alpha)
Physical	0.90
Psychological	0.88
Social	0.58
Environmental	0.71

Table 3: Correlation between the domains of the Hausa version of the WHOQOL-BREF questionnaire

Domain	Physical	Psychological	Social	Environmental
Physical	1	—	—	—
Psychological	0.80	1	—	—
Social	0.65	0.70	1	—
Environmental	0.72	0.74	0.61	1

were found to be statistically significant [Table 5]. These were then entered into logistic regression equation,

Table 4: Comparison of the quality of life (QOL) scores of depressed and nondepressed HIV positive respondents at the University of Maiduguri Teaching Hospital, Nigeria

| Domains | Mean (SD) | | T | *P*-value |
	Nondepressed (*n* = 243)	Depressed (*n* = 60)		
Physical	63.64 (13.2)	43.60 (19.67)	9.739	<0.001**
Psychological	60.49 (13.58)	41.82 (19.33)	8.972	<0.001**
Social	54.89 (15.20)	41.09 (15.29)	6.553	<0.001**
Environment	52.81 (12.27)	36.94 (14.77)	8.913	<0.001**
Global	232.39 (46.82)	163.34 (59.16)	10.018	<0.001**

**Statistically significant findings

Table 5: Sociodemographic and clinical correlates of quality of life among patients on antiretroviral therapy in Maiduguri

Variable	Poor QOL Freq (%)	Good QOL Freq (%)	Total Freq (%)	χ^2	*P*-value
Age (years)					
18-37	25 (64.1)	162 (61.4)	187 (61.7)	0.11	0.86
38-57	14 (35.9)	102 (38.6)	116 (38.3)		
Gender					
Female	33 (84.6)	106 (40.2)	139 (45.9)	27.06	0.001**
Male	6 (15.4)	158 (59.8)	164 (54.1)		
Occupation					
Class I	1 (2.6)	25 (9.5)	26 (8.6)	3.65	0.46
Class II	6 (15.4)	35 (13.3)	41 (13.5)		
Class III	5 (12.8)	36 (13.6)	41 (13.5)		
Class IV	12 (30.8)	95 (36.0)	107 (35.3)		
Class V	15 (38.4)	73 (27.6)	88 (29.1)		
Marital status					
Not Married	21 (53.8)	159 (60.2)	180 (59.4)	0.57	0.49
Married	18 (46.2)	105 (39.8)	123 (40.6)		
Education					
Non-literate	31 (79.5)	64 (75.8)	231 (76.2)	0.26	0.69
Literate	8 (20.5)	200 (24.2)	72 (23.8)		
CD4 cell count					
<200	28 (71.8)	81 (30.7)	109 (36.0)	24.95	0.001**
≥200	11 (28.2)	183 (69.3)	194 (64.0)		
CDC staging					
Stage II	9 (23.1)	98 (37.1)	107 (35.3)	4.03	0.28
Stage III	16 (41.0)	104 (39.4)	120 (39.6)		
Stage IV	14 (35.9)	62 (23.5)	76 (25.1)		
Diagnosis of depression					
Depressed	29 (74.4)	31 (11.7)	60 (80.2)	81.93	0.001**
Not depressed	10 (25.6)	233(88.3)	243 (19.8)		

**Statistically significant findings

of which, female gender, CD4 lymphocyte count and diagnosis of clinical depression were strongly associated with the global Quality of Life (QOL) outcome. Female respondents on antiretroviral therapy were 5.8 times more likely to have poorer quality of life when compared to their male counterparts, OR = 5.78 (95% C.I.: 0.065-0.461). Also, CD4 lymphocyte count was a strong determinant of QOL. In fact, respondents with low CD4 lymphocytes counts, that is, counts below 200/mm^3, were 3.57 times more likely to have poorer QOL in comparison to those with higher counts, OR = 3.57 (95% C.I.: 0.093-0.845). Similarly, the diagnosis of clinical depression has a negative impact on the global QOL outcome. Respondents with comorbid depression were 14.1 times more likely to have poorer QOL when compared to the nondepressed ones, OR = 14.09 (95% C.I.: 0.031-0.165). These findings were presented in Table 6.

DISCUSSION

This study examined the impact of depression, as a dimension of psychological morbidity, on the health-related quality of life of people living with HIV/AIDS on HAART as well as determined the sociodemographic and clinical correlates associated with poor quality of life in this group of respondents in Maiduguri, northeast Nigeria. To the best of our knowledge, this is the first study conducted in this part of the country that attempted to address these two topical issues.

The prevalence of clinical depression found among the respondents in this study was 19.8% according to the ICD-10 diagnostic criteria. This is relatively lower than the rates found in previous studies conducted in the US and other sub-Saharan countries. This relatively lower rate could be attributed to the fact that the respondents recruited for this study who were already on HAART had already spent some time with the ailment (average duration since diagnosis was 18.64 ± 3.7 months) and must have developed some adaptive coping strategies which might be protective against the development of depression. In the previous studies, respondents were recruited based on their HIV seropositivity and as such, even newly diagnosed patients who were yet to adjust psychologically from the shock of the diagnosis were enrolled that automatically increased the possibility of the detection of depression in them.

Table 6: Logistic regression analysis for variables significantly associated with global quality of life (QOL) in the respondents on ART in UMTH, Maiduguri

Variable	β-coefficient	SE	Wald	Odds ratio	95% C.I.	*P*-value
CD4 count	1.274	0.564	5.099	5.75	(0.093-0.845)	0.024**
Gender	1.755	0.500	12.301	8.20	(0.065-0.461)	0.001**
Diagnosis of depression	2.644	0.430	37.860	21.80	(0.031-0.165)	0.001**

**Statistically significant findings

In terms of the sociodemographic characteristics of the respondents, there is a preponderance of males to females (54.1% vs. 45.9%) in this study; this is not in keeping with the overall gender distribution of the disease in sub-Saharan Africa, Nigeria inclusive, from previous surveys which have consistently shown higher rates of HIV positivity in females due to social, economic, cultural, and biological reasons that increased their vulnerability to infection with the virus. The gender discrepancy found in this study could be due to (1) the economic advantage of males over females thus making more men come forward for treatment and (2) possible cultural constraints that limit the free movement of women particularly in northern Nigeria without the consents of their husbands or male guardians thus serving as an impediment in terms of their access to health care. Another finding that is worth commenting on in this study is the fact that over two thirds of the HIV+ respondents belong to the lower social classes (i.e. social classes IV and V). This could be due to the fact that the clinic offers free antiretroviral drugs and other services for patients who come forward to access the services, thus, attracting more people who are less economically empowered. Those HIV+ people belonging to the higher social classes are more likely to seek treatment in private hospitals or in highly confidential settings in order to avoid the 'perceived publicity' associated with their seropositive status and the attendant stigmatization that follows.

From our findings, the Hausa version of the WHOQOL-BREF instrument had a good internal consistency and high interdomain correlation to assess the QOL of PLWHA with and without depression. Although a detailed validity study was not done, the information obtained is indicative of the fact that the Hausa version of the WHOQOL-BREF questionnaire had good construct validity. This is in consonance with the report of previous studies that showed the WHOQOL-BREF to have good reliability and validity across different cultures worldwide.[40,42,44] In this study, patients with comorbid depression had lower QOL in all the domains of WHOQOL-BREF as compared to the nondepressed respondents. Earlier studies have shown that both HIV/AIDS and depression existing as separate entities in patients living with either of them have negative impacts on the QOL of their sufferers,[14,25] expectedly therefore, the occurrence of these two clinical conditions as Comorbidities would impair the QOL of the respondents as found in this study.

In terms of the quality of life outcomes of the respondents on all the domains, a comparative analysis of the mean scores of the nondepressed and depressed respondents carried out revealed that the nondepressed respondents had higher scores on all the domains than their depressed counterparts which were indicative of

better quality of life in the nondepressed respondents. The outcome here is consistent with findings from previous studies conducted by Sherbourne *et al.* (2000),[26] Yen *et al.* (2004),[43] and Liu *et al.* (2006).[27]

On the physical domain, the nondepressed respondents rated their physical health higher than the depressed ones and there was a statistically significant difference between them. This might be because this domain rates parameters such as enough energy, satisfaction with sleep, ability to perform daily living activities, and capacity to work. All these could be independently impaired in patients with depression and could be further compromised when depression coexists with other disease entities including HIV/AIDS.

The psychological domain rates cognitive areas such as enjoying life, feelings of life to be meaningful, ability to concentrate, satisfaction with self, and negative feelings such as blue mood, despair, etc. Here, the depressed respondents also rated their quality of life worse than the nondepressed ones as evidenced by their lower mean QOL score and there was a statistically significant difference. The most likely reason that could be adduced for this outcome, is that depression as a clinical condition, is usually associated with negative cognition and negative self-perception that were all assessed in this domain; hence, the depressed PLWHAs fared poorer than those without comorbid depression. Similar findings were documented by Adewuya *et al.* (2008)[14] and Olisah *et al.* (2011)[22] in Nigeria.

The social relationships domain assesses interpersonal relationships, sex life and support from friends. Here, the depressed respondents also fared poorer than the nondepressed ones and there was a statistically significant difference in their mean QOL scores. This finding is however, different from that of Adewuya *et al.* (2008)[14] who found no significant relationship between depression and HRQOL on this domain. Throughout, Africa, and particularly the setting in which this study was conducted, communal way of life, with the patient having a very large social support base is the norm. However, the stigmatization associated with the diagnosis of HIV and the misconception regarding its etiology are very common, the PLWHAs most of the time conceal their HIV status while suffering in silence. This may be responsible for the impairment of their QOL on this domain.

On the environmental domain which assesses safety in daily life, safety of the physical environment, enough money to meet their needs, opportunity for leisure and satisfaction with the condition of living place, more depressed respondents rated their HRQOL poorer than the nondepressed ones and there was a statistically

significant difference. This result may be attributed to the sociodemographic profile of the respondents. Though, generally, over two thirds of the respondents in this study belong to the lower social classes (i.e. social classes IV and V), more respondents belonging to these social classes were found in the depressed group where 45 out of the 60 patients constituting about 75% were found. Since, social class has direct correlations with certain components of this domain such as the availability of enough money to meet basic needs and satisfaction with the condition of living place, it is an expected outcome that the depressed respondents fared poorer than their nondepressed counterparts on this domain. Moreso, the negative cognitions found in depressive disorders might make the depressed respondents interpret their environment in terms of their safety and leisure activities differently.

Finally, on the global QOL outcome, the depressed respondents rated their quality of life globally poorer than their nondepressed counterparts and there was a statistically significant difference. This finding is due to the fact that the global outcome is a summation or aggregate of the individual domain scores and since their individual domain scores as earlier computed were low, the global outcome will expectedly be low as indicated by our result.

Different studies have identified several factors which affect the QOL of PLWHA. In a multicountry study among patients with HIV, it was found that female gender, older age groups, and the less educated had a lower QOL.[45] A study among African American HIV positive participants revealed that suffering stigmatization and the presence of the symptoms of HIV were associated with poor QOL.[46] In this study, female gender, low CD4 lymphocyte count and depression were associated with poor global QOL outcome. Depression can decrease QOL and can also be the result of poor QOL.[14] Because of the cross-sectional nature of this study, the authors could not establish a cause–effect relationship between depression and QOL. The relationship between CD4 count and poor QOL could also be explained by the fact that lower CD4 counts are most commonly associated with severer stages of HIV/AIDS that usually have symptoms that impair adjustments on virtually all the domains of QOL. While the relationship between poor QOL and the female gender could be due to psychosocial difficulties experienced by women particularly attributable to the patriarchal nature of the society in which the study was conducted.

In contrast with other studies, there were no significant associations between the CDC staging of the disease and other sociodemographic characteristics with QOL.[45,47]

Limitations of the study

The results of this study need to be interpreted with caution as this is the first time that the Hausa version of the WHOQOL-BREF has been used and the content and criterion validities have not been assessed. Secondly, all the HIV positive subjects included in the study were chosen from the UMTH ART Clinic where the antiretroviral drugs are given free. Considering the free antiretroviral therapy given, patients belonging to the lower social classes are likely to be over represented in the study sample, and therefore may not be truly reflective of the HIV/AIDS population in Maiduguri.

CONCLUSION

Depression is a relatively common comorbid condition that affects approximately one in every five patients on antiretroviral therapy and its presence significantly impairs the QOL of the sufferers. The authors hereby recommend that the holistic care of people living with HIV/AIDS should include routine assessment of the patients for possible psychiatric morbidity, most especially depression, so as to improve treatment outcomes and enhance the quality of life of the patients. This could be achieved through the provision of simple screening instruments for psychiatric conditions in all HIV clinics in order to improve on case detection and early institution of therapy. Secondly, consultation-liaison psychiatric services should be extended to patients on highly active antiretroviral therapy in institutions where such arrangement exists, and efforts should be made towards the establishment of such units in settings where none exists for the purpose of optimizing patients care.

ACKNOWLEDGMENTS

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