

*Full Length Research Paper*

# Depression, Self-Stigma and Quality of Life: A Comparative Analysis of Adults on Highly Active Antiretroviral Therapy (HAART) and Diabetics in a Tertiary Health Institution in Northeastern Nigeria

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## Abstract

Despite the change in status of HIV infection to a chronic disorder akin to diabetes mellitus due to the use of antiretroviral medications, HIV+ subjects in sub-Saharan Africa still suffer from the effects of their 'spoiled identity'. This study compared the prevalence of depression and self-stigma among HIV+ and diabetic subjects and evaluated the differential correlation between depression and their quality of life. This study was conducted at the University of Maiduguri Teaching Hospital in Nigeria and the subjects were drawn using systematic random sampling. The Beck Depression Inventory, the 3-item stigma scale and the WHOQOL-BREF were used for data collection. Prevalence of depression was 20.5% in the HIV subjects against 8.3% in the diabetics ( $\chi^2=17.46$ ,  $p<0.001$ ) and the experience of self-stigma was about 4-times more likely in the HIV+ subjects than the diabetics (60.1% Vs 16.7% respectively:  $\chi^2=116.99$ ,  $p<0.001$ ). There were stronger negative correlations between depression and quality of life scores among the subjects on HAART than among the diabetics. Conclusively, we therefore recommend routine clinical surveillance and psycho education on adaptive coping strategies in the management of the HIV+ subjects.

**Keywords:** Depression, Self-stigma, Quality of life, Highly active antiretroviral therapy, North-eastern Nigeria.

## INTRODUCTION

The World Health Organization defined Quality of life (QOL) as "the individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (World Health Organization Quality of Life (WHOQOL) Group, 1994). It is a multidimensional concept that is affected in a complex fashion by the person's physical health, psychological state, level of independence, social

relationships, personal beliefs and their relationship to the salient features of the environment (World Health Organization Quality of Life (WHOQOL) group, 1995). QOL assessment is increasingly becoming important in clinical management as it evaluates the overall well-being within the larger society and its principal focus is to enable people as optimally as possible evaluate their goals and select their lifestyle (Kuyken, 1994; World Health Organization (WHO), 1999). In addition, it is an important variable when assessing the outcomes of different treatment modalities in that it provides useful information that can be incorporated into the planning and evaluation of various treatment approaches (Donaldson and Mohr, 2009). QOL assessment

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introduces empathy into a system of healthcare delivery that tends to focus on symptomatic improvement or on end-points such as CD4 count or viral load in HIV infection or blood glucose level in diabetes mellitus which are rather mechanistic (Casado, 2005).

The use of the highly active antiretroviral therapy (HAART) has changed the status of HIV infection from a rapidly fatal one to a chronic condition comparable to diabetes mellitus and other chronic conditions (Egede, 2007). Despite this development, HIV seropositive individuals in sub-Saharan Africa still suffer from the consequences of stigmatization and societal misperceptions especially regarding the aetiology of the disorder which patients with other chronic conditions do not experience (Simbayi, 2007). These societal misperceptions often impact negatively on the patients' view about themselves and their degree of relatedness with the larger environment. Thus, people living with HIV (PLHIV) and by extension other chronic medical conditions experience enormous psychosocial difficulties which usually serve as 'harbingers' for negative self-perception and other debilitating mental illnesses. Literatures abound that have demonstrated the occurrence of mental illnesses in those with chronic disorders and clinical depression is consistently ranked one of the commonest (Katon, 2011; Carney and Freedland, 2008; Van der Kooy et al., 2007; Katon, 2003; Koenig and Kuchibhalla, 1998).

Comorbid depression in such settings impacts negatively on the quality of life of the sufferers, as well as on their adherence to medications and other forms of therapy thus compromising clinical outcomes (Di Matteo et al., 2000; Ziegelstein et al., 2000; Simansick et al., 1995; Lustman et al., 2000). The experience of stigma among HIV-infected patients on antiretroviral therapy independent of other comorbid conditions remains high and also adversely affects the psychosocial adjustments (Peltzer and Ramlagan, 2011; Herrmann et al., 2013; Lowther et al., 2014). Few researches in Africa have looked at the psychological problems confronting this vulnerable group of people in terms of their self-perception and fewer studies have examined the impact of depression on their quality of life (James et al., 2010; Adewuya et al., 2008). Despite, the improvement in the quality of care and the attendant longevity following the introduction of the antiretroviral medications, HIV seropositive individuals often experience self-stigma which often serves as an obstacle to the revelation of ones' serostatus and by extension health seeking (Cook, 2002; Burack et al., 1993; Petrushkin et al., 2005, Olisah et al., 2011). In spite of the fact, that Diabetes Mellitus is also a chronic disorder with multisystem complications and attendant impairment in health-related QOL and independence, adults living with this disorder based on our clinical experience are often treated compassionately in the African setting. This is in sharp

contrast to how HIV+ individuals are regarded and treated in the society. This study analyzed how the health-related quality of life of PLHIV and diabetics are differentially influenced by the occurrence of depression and internalized stigma. Thus, it is important in that the outcome could serve as the basis for advocacy and for the incorporation of basic mental health care in the management of these categories of patients.

In this study, we regarded both conditions as chronic disorders but we hypothesized that based on their peculiarities; there may be differential views about their perception of self and in the occurrence of depression as a prototype mental illness. The aims of this study were to: (1) evaluate self-stigmatization and occurrence of depression among HIV+ adults as index group and diabetics as the control group, and (2) compare the impact of depression on the health-related qualities of life of the respondents.

## MATERIALS AND METHODS

This was a cross-sectional case-comparison study that assessed depression and quality of life among adults on HAART (as the index group) and diabetics (as the controlled group) at the antiretroviral therapy (ART) and endocrinology outpatient clinics respectively of the University of Maiduguri Teaching Hospital in North-eastern Nigeria. The inclusion criteria for the index group were: all HIV+ adults on HAART based on the Nigerian guidelines between the ages of 18 and 60 years (Nigerian National Guidelines for antiretroviral therapy, 2005), who gave their consent and had enough understanding of English Language. The inclusion criteria for the control group were; adults within 18 to 60 years age bracket, who gave their consent and were diagnosed with diabetes mellitus based on the WHO guidelines (World Health Organization, 2006). The exclusion criteria include: (i) those who refused to give their informed consent or who do not understand English language (ii) those with severe comorbid physical illness or cognitive impairment that could affect their response. The respondents were also appropriately matched for age, years of education and sex. Age difference of  $\pm 5$  years and years of schooling difference of  $\pm 2$  years between the groups were considered acceptable.

At the time of the study, the ART clinic had 3,594 HIV+ adults on HAART while the endocrinology clinic had 1,865 diabetics on treatment (Medical Records UMTH, 2010). The sample size was calculated using a prevalence of depression of 35% among HIV+ subjects in Northern Nigeria obtained by Sale et al. (2008). The systematic random sampling technique ( $n^{\text{th}}$  sampling) was used for data collection. The sampling ratios were 1:10 and 1:5 for the HIV+ and diabetic subjects respectively. Therefore, the sampling intervals were

every other tenth patient for the subjects on HAART and every other fifth patient for the diabetics, until a total of 350 respondents were separately obtained for both groups. Each HIV+ subject interviewed is appropriately matched with a diabetic subject. The lists of all the patients in both clinics constituted the sampling frame, and the starting points on the lists were chosen at random using the random number table.

The following instruments were administered to all the respondents:

(1) An anonymous socio-demographic questionnaire designed by the author soliciting for the age, sex, years of education, marital status and occupational status of the respondents using the social class stratification system by Borofka and Olatawura 1976. This system classified individuals based on their occupations into: social class I, (Highly skilled professionals like Doctors, Lawyers, etc.), social class II (Intermediate skilled professionals like, Technicians, nurses, etc.), social class III (Low skilled respondents like junior clerks, drivers, junior military, etc.), social class IV (Unskilled respondents like petty traders, messengers, etc.) and social class V (Unemployed respondents).

(2) Stigma scale: is a 3-item scale which was originally designed to assess the perceived stigma of stroke (Jacoby, 1994). In this study, it was revised and adapted to make it appropriate for respondents with HIV and Diabetes Mellitus. Respondents were asked to state whether, because of their HIV+ status or diagnosis of diabetes mellitus, they felt that other people were uncomfortable with them, treated them as inferior and preferred to avoid them. It has a scoring system of 0 (no) or 1 (yes) for each item and the overall score is the sum of positive responses, with higher scores associated with a greater sense of stigma. A score of 3 indicates that the person is severely stigmatized by the presence of a disease (0 = no stigma, 1 = mild stigma, 2 = moderate stigma and 3 = severe stigma). Validity and reliability have been well established for the instrument (Cronbach's  $\alpha = 0.72$ ) for epilepsy as a prototype chronic disorder (Lee et al., 2005; Jacoby et al., 2001).

(3) Beck Depression Inventory, 2nd edition (BDI-II): It is a 21 – item instrument and one of the most widely used for screening and analyzing the intensity of Depression. It assesses 4 components of Depression, viz.; cognitive, behavioral, affective and somatic (Steer et al., 1999; Brown et al., 1995). Each item is scored on a scale of 0 to 3 and the total score ranges between 0 to 63, the higher the total score, the severer, the depressive symptoms. In grading the severity of depressive symptoms, the following ranges were used: Minimal range or no depression 0 – 13, mild depression 14 – 19, moderate depression 20 – 28, and severe depression 29 – 63 as proposed by Steer et al. It is widely used and has been validated for use in Nigeria (Adebayo, 1996; Olley et al., 2001; Awaritefe, 1998).

(4) The World Health Organization Quality of Life BREF (WHOQOL-BREF) Scale was used for data collection on Health-related quality of life (HRQOL). This is a shorter version of the original WHOQOL-100 and consists of 26-items that are scored over 4 major domains, namely: physical, psychological, social relationships and environment (WHOQOL Group, 1995). 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 (in this case, HIV+ and diabetic respondents) and populations with different languages and culture (Kuyken et al., 1994). In addition, because of its brevity, it takes a relatively shorter time to administer (about 6 minutes in this study) which makes it appropriate for use in busy clinics as obtained in this setting.

### 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.

### Procedure

The interviews were conducted at three stages by three different interviewers who were blinded to the outcomes of the preceding stage. In the first stage, the sociodemographic questionnaire and the stigma scale were administered to all eligible respondents by a single interviewer. The same respondents were administered the BDI-II by another interviewer who was blinded to the outcome of the first stage, while in the third stage, the WHOQOL-BREF was administered by another interviewer who was also blinded to the BDI-II outcome of the respondents. The blinding protocol was adopted in order to eliminate any investigator's bias.

### Data analysis

The SPSS version 16.0 was used for data analysis. Descriptive statistics were used to summarize the data. The mean scores of the BDI-II, that of the global and domain scores of the WHOQOL-BREF were compared using t-test, while the correlations between depression and the quality of life outcomes across the domains were examined using Pearson product moment correlation coefficient,  $r$ . The value of  $r$  is such that  $-1 \leq r \leq +1$ .

Values of  $r$  greater than 0.8 indicate strong correlation, while values between 0.5 and 0.8 indicate fair correlation and values below 0.5 indicate weak correlation (Parikh et al., 2010). Scatter plots were also used to demonstrate the correlations between the BDI-II outcomes and the global QOL scores between the two groups. The coefficients of determination,  $R^2$  for both groups were determined. The coefficient of determination is such that  $0 \leq r^2 \leq 1$  (Parikh et al., 2010), and denotes the strength of linear association between the two variables, in this case, the BDI scores and the global QOL scores. Significance was computed at  $p < 0.05$ , two tailed.

## RESULTS

Of the 350 HIV+ subjects recruited for the study, the data of only 303 subjects were finally analyzed which yielded a response rate of 86.6%. The data of 47 subjects were not analyzed due to; refusal to give informed consent ( $n=17$ ), comorbid debilitating physical illnesses ( $n=11$ ), and those whose questionnaires could not be analyzed due to missing data ( $n=19$ ). For the diabetics, the data of 288 subjects were finally analyzed which yielded a response rate of 82.3%. The 62 subjects whose data were not computed were due to; refusal to grant informed consent ( $n=13$ ), severe comorbid physical illness (e.g. recovering from Cerebrovascular accident, severe hypertension,) ( $n=11$ ), lack of understanding of English language ( $n=21$ ), incomplete information as result of missing data ( $n=17$ ).

Three hundred and three (303) HIV+ adults on HAART and 288 diabetics were interviewed. Of these figures, males constituted 54.1% and 57.6% in the HIV and diabetic groups respectively. Just 30% of the subjects on HAART were above the 19 to 39 years age bracket while 46% of the diabetics were above that age bracket. The distributions of the other sociodemographic variables for the two groups are presented in Table 1.

### Occurrence of depression and experience of perceived stigma between the groups

More respondents on HAART, 62 (20.5%) met the BDI diagnosis of depression as against 24 (8.3%) of the diabetics and the difference was statistically significant ( $\chi^2 = 17.46$ ,  $p = <0.001$ ). In terms of the BDI-graded severity of depression, over 70% of the respondents in both groups had mild to moderate depression and about equal proportion had severe depression and the difference here was not statistically significant ( $\chi^2 = 5.746$ ,  $p = 0.067$ ). The mean $\pm$  SD BDI score was also higher among the HAART subjects than the diabetics and difference was statistically significant ( $t = 1.705$ ,  $p =$

$<0.001$ ). In terms of the experience of perceived stigma, one hundred and eighty two (60.1%) of the subjects on HAART and 48 (16.7%) of the diabetics felt stigmatized and the difference was statistically significant ( $\chi^2 = 116.99$ ,  $P = <0.001$ ). There was also a statistically significant difference in terms of the severity of depression as over 75% of the subjects on HAART experienced moderate to severe stigmatization as against below 30% of the diabetic subjects ( $\chi^2 = 38.01$ ,  $p = <0.001$ ). These findings are presented in table 2.

### Correlations between BDI- II scores and the QOL scores of the subjects

There were negative correlations between the BDI and QOL scores in the HIV+ subjects with Pearson coefficients ranging from - 0.53 on the social relation domain to - 0.701 on the global outcome and all the values were statistically significant ( $p < 0.001$  on all the outcome measures). The Pearson's correlation coefficients were also negative for the diabetic subjects on all the domains. However, the values only range from - 0.121 on the environmental domain to - 0.188 on the social relationship domain. The values were only statistically significant on the physical and social relationship domains as well as the global measures ( $p=0.025$ ,  $p < 0.001$ , and  $p=0.01$  respectively). The findings are presented in table 3.

The estimated coefficients of determination of the scattered plots yielded  $R^2$  values of 0.182, 0.491 and 0.023 for all the respondents, the HIV+ group, and the diabetics respectively. These findings are depicted in figures 1a,b and c.

## DISCUSSION

This is the first study that assessed depression, self-stigma and quality of life among HIV+ adults on antiretroviral therapy and compared the outcome with those of diabetics in this part of the globe. In this study, there were more males than females in both groups. This could be accounted for by the patriarchal nature of the setting in which the study was conducted where males have easier access to healthcare while females have to be granted permission for health seeking by the male guardians which might impede health care access. Males also have economic advantage over the females which is also an important determinant of access to healthcare. In terms of age distribution, more of the HIV+ respondents were between the 19 to 39 years age bracket, while despite the matching process, higher proportion of older respondents were found in the diabetic group. The most plausible explanation is that HIV is a disorder of those who are sexually active while

**Table 1.** Sociodemographic profile of the respondents

Characteristics	HIV+ [n(%)]	Diabetics [n(%)]	Total [n(%)]
<b>Gender</b>			
Male	164(54.1)	166(57.6)	330(55.8)
Female	139(45.9)	122(42.4)	261(44.2)
<b>Age group</b>			
≤ 19	6(2.0)	0(0.0)	6(1.0)
20 – 29	70(23.1)	25(8.7)	95(16.1)
30 – 39	136(44.9)	131(45.5)	267(45.2)
40 – 49	68(22.4)	79(27.4)	147(24.9)
50 – 59	23(7.6)	39(13.5)	62(10.5)
≥ 60	0(0.0)	14(4.9)	14(2.3)
<b>Years of education</b>			
≤12	197(65.0)	164(56.9)	361(61.1)
>12	106(35.0)	124(43.1)	230(38.9)
<b>Occupation</b>			
Class I	26(8.6)	12(4.2)	38(6.3)
Class II	41(13.5)	58(20.1)	99(16.8)
Class III	41(13.5)	70(24.3)	111(18.6)
Class IV	107(35.3)	128(44.5)	235(40.0)
Class V	88(29.1)	20(6.9)	108(18.3)
<b>Marital Status</b>			
Married 123(40.6)	226(78.5)	349(59.1)	
Single 63(20.8)	36(12.5)	99(16.8)	
Widowed	93(30.7)	10(3.5)	103(17.4)
Divorced	4(1.3)	0(0.0)	4(0.6)
Separated	20(6.6)	16(5.5)	36(6.1)

**Table 2.** A summary of the comparison of the severity of depression and perceived stigma between the two groups

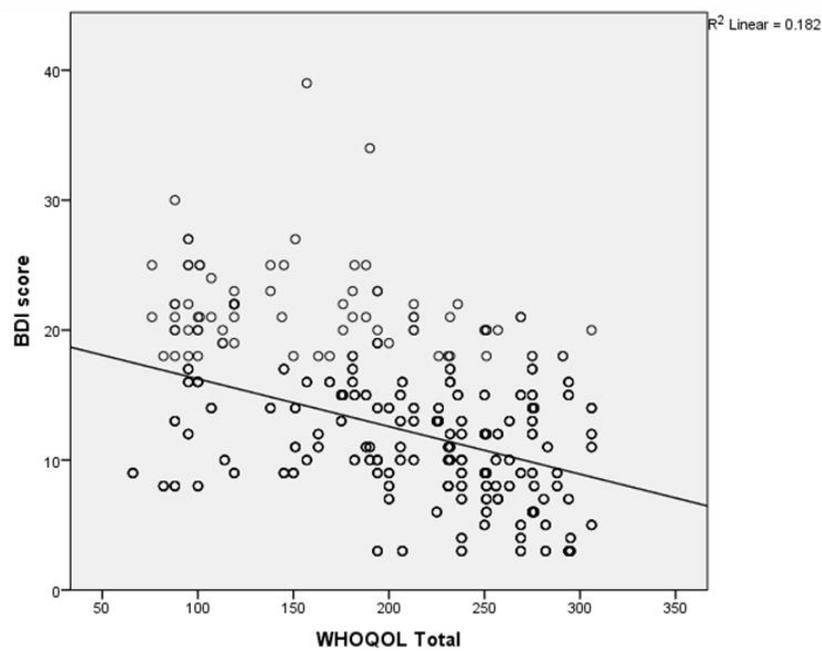
	HIV+ [n=303] Freq (%)	Diabetic [n=288] Freq (%)	Statistics
<b>Occurrence of Depression</b>			
Non-depressed	241(79.5)	264(9.7)	$\chi^2 = 17.46, p = <0.001^{**}$
Depressed	62(20.5)	24(8.3)	
<b>Severity of depression</b>			
Mild	11(17.8)	10(41.7)	$\chi^2 = 5.746, p = 0.067$
Moderate	34(54.8)	8(33.3)	
Severe	17(17.4)	6(25.0)	
BDI scores [Mean (+ SD)]	12.56+/- 5.97	11.81+/- 4.64	$t = 1.705, p = <0.001^{**}$
<b>Occurrence of stigma</b>			
No stigma	121(39.9)	240(83.3)	$\chi^2 = 116.99, p = <0.001^{**}$
Felt stigmatized	182(60.1)	48(16.7)	
<b>Severity of stigma</b>			
Mild	43(23.6)	34(70.8)	$\chi^2 = 38.01, p = <0.001^{**}$
Moderate	87(47.8)	9(18.8)	
Severe	52(28.6)	5(10.4)	

\*\* Statistically significant findings

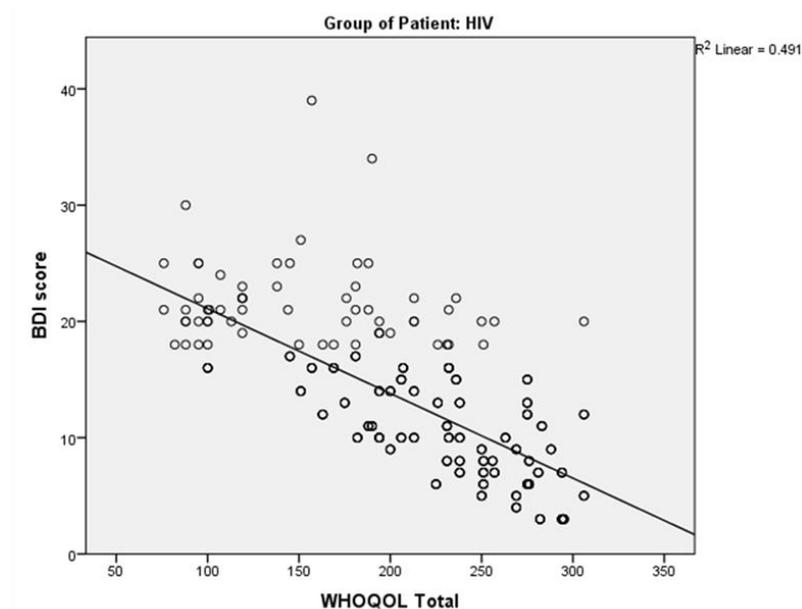
**Table 3.** A comparison of the correlation between the BDI scores and the domains and global quality of life (QOL) scores of the respondents

QOL Scores	HIV+ BDI Score		Diabetic BDI Score	
	Pearson co-eff (r)	p- value	Pearson co-eff (r)	p-value
Physical	- 0.641	<0.001**	- 0.132	0. 025**
Psychological	- 0.639	<0.001**	- 0.131	0. 062
Soc. Relationship	- 0.530	<0.001**	- 0.188	<0. 001**
Environmental	- 0.656	<0.001**	- 0.121	0. 078
Global	- 0.701	<0.001**	- 0.152	0. 010**

\*\*Correlation is statistically significant at the 0.05 level (2 –tailed)



**Figure 1a.** Scatter plot chart for both HIV+ and Diabetic respondents



**Figure 1b.** Scatter plot chart for HIV+ respondents

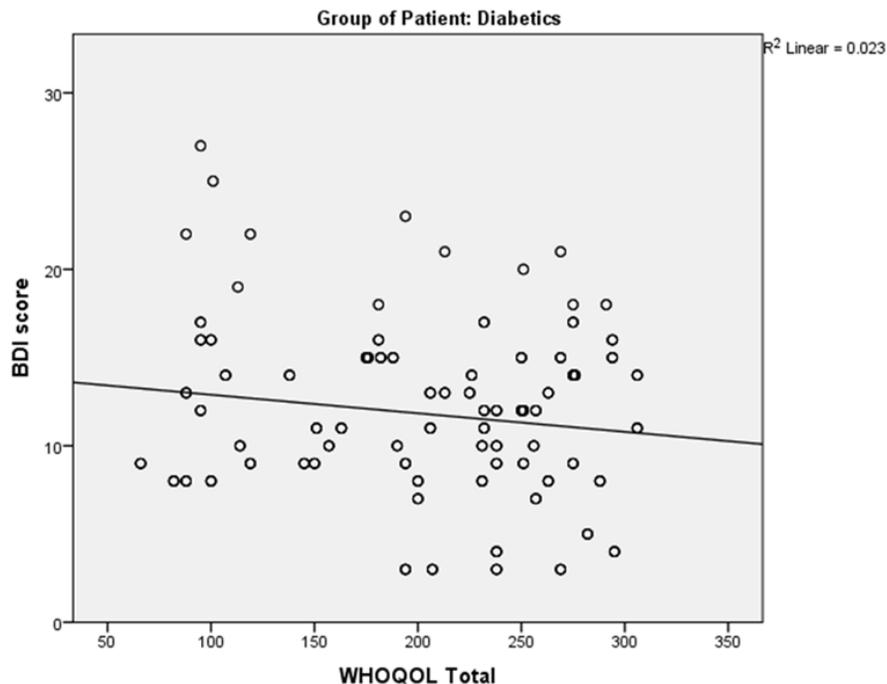


Figure 1c. Scatter plot charts for diabetic respondents

diabetes mellitus is relatively more prevalent in the elderly despite the demographic transitional trend. Over 50% of the respondents in both groups also belonged to the lower occupational classes (classes IV and V). This may be due to the fact that as a public health institution, the costs of medical services are cheaper than in private settings, especially in sub-Saharan Africa where there is no universal coverage by the health insurance scheme.

Based on the prevalence of depression as an outcome measure, depression was about 2.5 times commoner among HIV+ adults than the diabetics (prevalence of 20.5% Vs 8.3% in the HIV+ and diabetics respectively) and the difference was statistically significant. This finding was further supported by the higher mean BDI scores of the HIV+ subjects than the diabetics. The prevalence rates of clinical depression obtained in both groups in this study are higher than the reported prevalence of 3.3% of major depression among community-dwelling adults in Nigeria as estimated by Gureje *et al.* (2006) in the Nigerian survey of mental health and well-being conducted between 2001 and 2003. This corroborates the finding that depression is commoner among those with chronic illnesses when compared to healthy adults as earlier asserted by Egede, (2007). Though, there exist a bidirectional relationship between depression and chronic medical ailments, the reason for this trend could be explained by the emerging evidence from Katon *et al.* (2011) and Kennedy *et al.* (1991) that have all pointed out that the distress, symptom burden, functional impairments, and

physiological changes associated with chronic medical ailments could all be depressogenic.

In terms of the higher prevalence of depression in the HIV+ subjects than the diabetics, it had earlier been inferred by Mbonu *et al.* (2009) that PLHIV are subjects of societal stigmatization and this could alone serve as a significant psychosocial stressor that could predispose them to depression. Secondly, patients already commenced on ARVs are in the advanced stages of the disease, and are therefore more likely to have constitutional symptoms such as poor appetite, weight loss, etc. which may mimic depressive symptoms when the instrument for assessing depression is administered, hence, a higher detection rate. Though, diabetics may have similar constitutional symptoms, their intensity and frequency of occurrence may not be as pronounced as in the HIV+ subjects. Finally, some of the ARVs whose effects have not been independently assessed could have depressogenic effects. Efavirenz is specifically noted for its neuropsychiatric side effects including depression (Subbaraman *et al.*, 2007). HIV+ subjects on these medications are therefore more likely to be categorized as depressed in comparison to their diabetic controls.

Analysis of the occurrence of felt stigma revealed that the HIV+ respondents are 3.6 times more likely to experience it than their diabetic counterparts (prevalence rates of 60.1% Vs. 16.7%) and the difference was statistically significant. The prevalence rate of over 60% of self-stigma among the HIV+ group is similar to the

one reported by Yebei *et al.* (2008) in Kenya but higher than the rate of 28% reported by Lau and Tsui, (2006) in Hong Kong. The demographic and socio-cultural similarities between Nigeria and Kenya may account for the identical findings. HIV infection has been stigmatized in the traditional African settings because of its predominant mode of transmission which in over 80% of cases is through heterosexual contacts and is therefore viewed as a punishment for deviant behaviour. The experience of self-stigma in the context of such a socially stigmatizing illness could therefore be readily discerned. Based on sociological theories regarding the aetiology of stigma, individuals suffer from self-stigma when they internalize negative perceptions regarding themselves, as against perceived stigma where they suffer from other people's prejudicial attitudes and discriminatory behaviour (Jacoby, 1994; Scambler, 2004). The process of internalizing stigma is complex; however, self-stigma has been linked with perceived stigma. In HIV seropositive individuals in the African setting, the fear of negative judgement or discrimination from others profoundly influences the way they view themselves and their coping strategies (Oduguwa *et al.*, 2014). The African view about diabetes mellitus is however not different from that of other common ailments which usually attract empathy from the society. Based on these different perspectives the society views the two conditions, it could be deduced therefore that the HIV+ subjects are more likely to experience self-stigma when compared to their diabetic counterparts.

In terms of the correlation between BDI scores and the global and domains quality of life outcomes, there were negative correlations in both groups, but the HIV+ subjects had fair negative correlations which were all statistically significant. While the diabetics had weak negative correlations and were only statistically significant on the global outcome, physical and social relationships domains. The stronger negative correlation found in the HIV+ subjects denotes that the diagnosis of depression has a more profound negative effect on the quality of life of the HIV + subjects than the diabetics. The finding of poorer QOL in the HIV seropositive subjects is in consonance with that of Hughes *et al.* (2004) in South Africa who found poorer QOL among seropositive subjects than the seronegative ones which in this case are represented by the diabetics. Liu *et al.* (2006) in the United States also reported lower QOL among depressed HIV+ positive subjects on HAART than their non-depressed counterparts. Identical outcomes were reported by Adewuya *et al.* (2008) and Olisah *et al.* (2011) in Nigeria with respect to the relationship between the diagnosis of depression and the quality of life of people living with HIV (PLHIV). The notable contrasting finding to this one is that of Poupard *et al.* (2007) in Senegal who reported lower rate of depression and good QOL scores for HIV+ subjects on

either Efavirenz-based or protease-inhibitor-based antiretroviral medications.

The plausible reasons for the variations in the correlations between depression and the quality of life outcomes of the HIV+ and the diabetic subjects in this study include: (1) Higher proportion of the HIV+ subjects had severer forms of depression than the diabetics. Out of a total of 23 subjects with severe depression, 17 were HIV+ while only 6 were diabetics. Since, the severer the intensity of depression, the more incapacitating it is, it could therefore be assumed that the more likely its negative impact will be felt on the health-related QOL. Hence, the differential correlation between depression and the QOL in the two groups of subjects. (2) Since, clinical depression negatively affects the various dimensions of functioning ranging from psychological, to physical, as well as social and cognitive processes, and these are the respective domains that are assessed in QOL evaluation, the impact of depression on these parameters are therefore more likely to be profound on the HIV+ subjects than the diabetics. (3) Based on our findings too, significantly higher number of the HIV+ subjects compared to the diabetics experienced self-stigmatization and since internalized stigma on its own is adjudged a significant psychosocial stressor, its higher occurrence in the HIV+ subjects could be responsible for the outcome obtained in this study. (4) Finally, the cumulative effects of both depression and self-stigma that are commoner in the HIV+ subjects could contribute to their poorer QOL than the diabetics.

Finally, in terms of the coefficient of determination, that is a measure of how well the regression line represents the data, the  $R^2$  values of 0.49, and 0.023 for the HIV+ and diabetics respectively could be explained thus: For the subjects on HAART, it means that about 50% of the variation in their global QOL, could be explained by the changes in their BDI scores as described by the regression equation. The other 50% of the global QOL variation remains unexplained. While for the diabetics, only about 2% of the variation in their global QOL score could be explained by changes in their BDI scores, the remaining 98% are unexplained. Hence, the correlation between global QOL outcome and the diagnosis of depression could be better explained in the HIV+ subjects than among the diabetics.

### Limitations of the Study

The results of this study need to be interpreted with caution as based on the cross-sectional nature of the study, inferences cannot be made on the cause and effect relationship between depression and quality of life among the subjects. Also, the similarities between some of the clinical manifestations of HIV/AIDS and the biological symptoms of depression may give

exaggerated prevalence of depression among the subjects on HAART.

## CONCLUSION

Despite a change in the status of HIV infection from a rapidly fatal disorder to chronic one due to the introduction of the antiretroviral medications with the attendant longevity, it has been demonstrated in this study that persons living with HIV in sub-Saharan Africa have a compromised health-related quality of life mainly due to the effects of clinical depression and negative self-esteem because of self-stigma. It is therefore recommended that clinical surveillance and psycho education that emphasizes adaptive coping strategies should be incorporated in the management of this vulnerable group. Attention also needs to be given to this group of individuals with respect to the formation of support and advocacy groups as well as pressing for anti-stigma legislations that will protect them and thus ultimately improve the overall quality of life.

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