Contributing Factors to Poor Quality Of Life and Validating World Health Organization Quality Of Life Questionnaires in Nigeria

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ABSTRACT
Background: Human Immunodeficiency Virus/AIDs constitute a major challenge to Quality of life (QOL). However, limited studies had been conducted using the WHOQOL (BREF) and WHOQOL-HIV (BREF) together to study QOL.
Aim: This study determined the impact of HIV/AIDS on the QOL of people living with HIV/AIDs (PLWHA) in Nigeria, identified contributing factors to poor QOL in the HIV/AIDs positive population and validate the reliability of WHOQOL-HIV (BREF).
Methods and Result: The study showed that HIV/AIDs had impact on the overall quality of life of PLWHA of some demographic information like marital status, education with $p < 0.05$. Each domain after been broken into domain scale(s) had high Cronbach's alpha reliability scores ranging from 0.513 for social relationships to 0.719 for physical domain (pain domain scale), while relatively high scores were observed in environmental and Spirituality Religion and Personal Believe domain.
Conclusion: The study has rekindled our awareness on the growing trend on the poor quality of life of PLWHA assessed in this study location using the Cronbach's alpha score. The moderate to strong Cronbach's alpha scores recorded in this study indicated a high reliability of the research instruments and the items were highly correlated. The reliability values noted in this study are comparable to those found in the original field test of the WHOQOL-HIV instrument.
Keywords: Impact; Demographic; Domain; Reliability; Score.

I.   INTRODUCTION
Globally, HIV/AIDS infection is one of the leading causes of mortality among young adults and according to a World Health Organization's (WHO) report, in 2018, nearly 37.9 million people have been living with HIV globally, with merely 23.3 million people receiving antiretroviral treatment, and about 770,000 people have died from HIV/AIDS.[1,2]. Over 75% of the deaths occurred in sub-Saharan Africa thereby retarding economic growth and destroying human capital [3] and that 70% of the world HIV positive individuals live in Sub-Saharan Africa [4,3]. Currently, Nigeria has a population of 1.9 million living with HIV with 130,000 new cases of infections and 53,000 AIDs related deaths [5,6]. This shows a reduction in the number of people living with the virus compared to 2012 data with 3.4 million people and 388,864 new infections, this was attributed to better surveillance. Nigeria new survey indicates a national HIV prevalence of 1.4% among adults aged 15-49 years as against 2.8% [7]. Also, Nigeria is now the 4th ranking country with the highest HIV prevalence. However, UNAIDS estimated that around two-thirds of new infections in West and Central Africa in 2017 occurred in Nigeria, despite achieving a 5% reduction in new infections between 2010 and 2017 [8,9]. NACA revealed that a total of 81,481 persons are living with the virus in Ondo State with prevalence rate of 0.9%, 10,000 of which are receiving Antiretroviral (ARV) treatment across the State [10]. In a close relation is Ekiti State with a lower prevalence rate of 0.7% [11]. ARV reduces both the mortality and the morbidity of HIV infection, but routine access to antiretroviral medication is not available in most of the Sub Sahara countries. Despite challenges in scaling up access, institutional reforms and political commitment to tackle the disease, the country has more citizens placed on life saving medication [12]. The rise in uptake of life saving medication may have been due to improved survival rate of PLWHA and adherence to the modified treatment guidelines on ARV. The guideline stipulates that persons with CD4 count of < 350 as against 250 in the previous national ART guidelines [13]. Nigeria has passed through several phases in her response to the epidemic, having launched her National Action Committee on AIDs (NACA) in 2010 with comprehensive National Strategic Framework which included framework to reach 80 percent of sexually active adults and 80 percent of most at-risk populations with HIV counseling and testing; ensured that 80 percent of eligible adults and 100

percent of eligible children received ART; and improve access to quality care and support services to at least 50 percent of people living with HIV [14,15].

Nigeria has shown steady progress on increasing access to treatment for people living with HIV, with the adoption of a test and treat policy in 2016. In recent years, there has been a significant expansion in the country's response to HIV. The number of sites providing services to prevent mother-to-child transmission of HIV has increased eightfold and the number of HIV counselling and testing sites has increased fourfold. A total of 11.3 million adults were counselled and tested for HIV in 2016, four times as many as in 2012 [7]. Ever since the introduction of Highly Active Anti-Retroviral Therapy (HAART) people living with HIV/AIDS have had appreciable rise in life expectancy and can pursue their normal life activities. Therefore, the responsibilities for care and support to PLWHA   goes beyond the administration of drugs alone rather, it must include all supports that will enhance the quality of life of the affected persons [16]. We adopt the use of T squares and factor analysis to determine impact of demographic information quality of life and validate the WHO instruments on the population.

II.   MATERIALS AND METHODS

The data used in the study is a primary data collected by direct interview and filling of the WHOQOL-HIV (BREF) questionnaires by 564 PLWHA attending Haematology/Virology clinics. These include people who are 18 years and older, infected with HIV for at least 6 months [17] who signed the consent letter to participate in the interview. The relative or control data was also collected by interview and filling of WHOQOL (BREF) questionnaires by 806 non-infected persons. The WHOQL-HIV (BREF) is an abbreviated 31-item version with six domains. While the WHOQOL-BREF is an abbreviated 26-item version with four domains. Each item was

rated on a scale of one to five with five indicating better quality of life. The case study for this research is Ondo and Ekiti states in the South West part of Nigeria. The analysis was carried out using SPSS 20.0 (IBM software). A descriptive analysis was performed for the socio-demographic and HIV-related information. T-test was used to identify contributing factors to poor QOL of PLWHA using the combined data of infected and non-infected. Factor analysis was carried out for the validation of WHOQOL-HIV (BREF) among the study population. Statistical tests were considered significant whenever the p-value was less than 0.05. The correlation among the various domains of QoL instrument was estimated using Spearman rank correlation. As a measure of internal consistency, Cronbach's alpha and corrected item-total correlations were calculated for each of the domains as well as for the total scale.

Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group.   It is considered to be a measure of scale reliability. A "high" value for alpha does not imply that the measure is unidimensional. If, in addition to measuring internal consistency, you wish to provide evidence that the scale in question is unidimensional, additional analyses can be performed.Values of the Cronbach's alpha coefficient ≥ 0.7 are acceptable, while values ≥ 0.8 are preferred.

This work was authorized by the Ethical Review Committee of Ondo State Ministry of Health (AD 4693/79) and Ekiti State University Teaching Hospital, Ado-Ekiti Ethics and Research Committee (EKSUTH A 67/2014/02/004).

III.   RESULTS

Table 1 shows the effect of demographic characteristics of PLWHA on the following domains: Physical(PHD), Psychological(PSD), Level-of-Independence(LID), Social-Relationship(SRD), Environmental(END) and Spirituality-Religion-Personal-Believe(SPD) and the overall quality of life.

Table 1: Effect of Demographic Factors on Different Domains (Values in Table are p-values)

VARIABLE	PHD	PSD	LID	SRD	END	SPD	WHOQOL
Q1	0.000*	0.176	0.040*	0.557	0.120	0.111	0.118
Q2	0.059	0.596	0.157	0.599	0.981	0.061	0.223
Q3	0.000*	0.222	0.000*	0.025*	0.002*	0.321	0.000*
Q4	0.117	0.420	0.421	0.578	0.009*	0.992	0.510
Q5	0.009*	0.807	0.002*	0.572	0.066	0.064	0.402
Q6	0.266	0.001*	0.000*	0.002*	0.000*	0.840	0.001*
Q7	0.812	0.510	0.070	0.399	0.778	0.447	0.396
Q8	0.399	0.327	0.565	0.611	0.069	0.071	0.129
Q9	0.104	0.041*	0.001*	0.590	0.018*	0.049*	0.028*

Q10	0.255	0.007*	0.038*	0.119	0.051	0.295	0.053
Q11	0.049*	0.005*	0.000*	0.000*	0.058	0.213	0.000*
Q12	0.167	0.065	0.004*	0.002*	0.000*	0.002*	0.000*
Q13	0.952	0.519	0.128	0.028*	0.343	0.256	0.346
Q14	0.481	0.126	0.150	0.469	0.415	0.164	0.218
Q15	0.009*	0.054	0.042*	0.047*	0.000*	0.000*	0.000*
Q16	0.429	0.326	0.262	0.261	0.543	0.128	0.210
Q17	0.778	0.015*	0.228	0.005*	0.790	0.313	0.092
Q18	0.000*	0.000*	0.000*	0.337	0.041*	0.008*	0.000*
Q19	0.002*	0.008*	0.013*	0.504	0.022*	0.391	0.002*
Q20	0.000*	0.000*	0.000*	0.000*	0.000*	0.022*	0.000*

Q1-(Age);Q2-(Sex);Q3-(Marital-status);Q4-(Do-you-have-children);Q5-(Number-of-Children);Q6-(Education);Q7–(Residence);Q8–(Employment);Q9-(Occupation);Q10-(Last-occupation);Q11-(Medical-Aid);Q12–(Does-your-medical-aid-pay-your-medical-expenses);Q13-(Have-you-disclosed-your-HIV-status-to-anyone);Q14-(If-not-are-you-planning-to-disclose-it-soon);Q15-(Do-you-belong-to-a-support-group);Q16-(When-were-you-diagnosed-with-HIV);Q17-(are-you-taking-ARVS);Q18-(Did-you-experience-side-effect);Q19-(Have-the-side-effect-be-resolved);Q20-(How-has-your-HIV-status-affected-your-life)

Results in Table 1 were discussed based on demographic factors that had impact or effects on the overall WHO quality of life. Question 3 on marital status showed that PHD, LID, SRD, END and WHOQL were significant. Question 6 on highest level of education showed generally that those with tertiary education have better quality of life compared to other groups. PSD, LID, SRD, END and WHOQL were significant. Question 9 on occupation showed generally that those in the student group have lower quality of life compared to other groups. PSD, LID, END and WHOQL were significant. Questions 11 and 12 on medical aids and access to it had impact on the overall quality of life and significant on the domains except END and SPD for Question 11; and PSD for Question 12. Question 15 on membership of a support group was more significant on environment and spirituality domains as well as the overall quality of life. Questions 18 and 19 on side effects had impact on most of the domains as well as on the overall quality of life. Question 20 on effect of HIV status showed generally that those with no effect have best quality of life compared to other groups.

3.1 Contributing Factors to Poor QOL of PLWHA
This section shows how the variables common to both WHOQOL-HIV (BREF) and WHOQOL (BREF) contribute to the quality of lives of PLWHA. The results are shown in Table 2.

Table 2: Comparison test for the combined data (Infected and Non-Infected)

Components-of-QOL	T	Df	p-value	Mean-Difference
Pain-&-discomfort	37.499	1366	.000	2.282
Dependence-on-medication-or-treatment	17.276	1366	.000	.998
Physical-environment-pollution	5.968	1366	.000	.251
Positive-feelings	-2.170	1366	.030	-.098
Spirituality-Religion-&Personal-Believe	-9.727	1366	.000	-.504
Thinking-learning-memory-&concentration	-1.902	1366	.057	-.087
Physical-safety-&-security	3.605	1366	.000	.168

Energy-&-Fatigue	1.209	1366	.227	.055
Body-image-&-appearance	2.547	1366	.011	.132
Financial-resources	-11.272	1366	.000	-.599
Opportunities-for-acquiring-new-information-&-skill	2.698	1366	.007	.126
Participation-in-recreation/leisure-activities	8.456	1366	.000	.409
Mobility	8.364	1366	.000	.334
Sleep-&-rest	6.253	1366	.000	.288
Activities-of-daily-living	2.913	1366	.004	.126
Work-capacity	3.586	1366	.000	.160
Self-esteem	2.695	1366	.007	.120
Personal-relationships	4.035	1366	.000	.184
Sexual-activity	.392	1366	.695	.021
Social-support	-1.848	1366	.065	-.093
Home-environment	7.516	1366	.000	.354
Health-&-social-care: accessibility-&-quantity	4.357	1366	.000	.211
Transport	2.496	1366	.013	.126
Negative-Feelings	23.565	1366	.000	1.290

Table 2 showed that there are differences in the scores of the infected and non-infected persons for most components. Variables with positive mean differences are the ones that have negative impact and contribute poorly to the quality of life of PLWHA, while those with negative mean differences have effect on those not infected with HIV/AIDs.

Physical Domain

3.2 Validity of WHOQOL-HIV (BREF)
Factor analysis was conducted to determine if any underlying structures exist for each item in the six different domains. Table 3 to Table 8 compares the strength of factors in each domains.

Table 3: Physical Domain: Correlation Matrix

	Pain-&-discomfort	Symptoms-of-PLWHA	Energy-&-Fatigue	Sleep-&-rest
Pain-&-discomfort	1.000	.562	.169	.069
Symptoms-of-PLWA	.562	1.000	.052	.007
Energy-&-Fatigue	.169	.052	1.000	.351
Sleep-&-rest	.069	.007	.351	1.000

Table 3 showed a higher correlation between pain and discomfort and symptoms of PLWHA. Rotated component matrix on the items revealed two components. The first component can be renamed into a "Pain Domain Scale" with a reliability test using cronbach's alpha of 0.719. While the second component can be renamed into a "Fatigue and lack of sleep Domain Scale" with a reliability test using cronbach's alpha of 0.517.

Psychological Domain

Table 4: Psychological Domain: Correlation Matrix

	Negative-feelings	Body-image-&-appearance	Thinking-learning-memory-&-concentration	Positive-feelings	Self-esteem
Negative-feelings	1.000	-.006	.066	.108	.050
Body-image-&-appearance	-.006	1.000	.220	.206	.325
Thinking-learning-memory-&-concentration	.066	.220	1.000	.209	.218
Positive-feelings	.108	.206	.209	1.000	.249
Self-esteem	.050	.325	.218	.249	1.000

Table 4 showed only a slightly higher correlation between Body image and appearance and Self-esteem. Rotated component matrix on the items revealed two components. The first component can be renamed into a "Body Image Appearance Domain Scale" with a reliability test using cronbach's alpha of 0.547. While the second was named "Negative feelings Domain Scale" no reliability test was carried out since it is a single item factor.

Level of Independent Domain

Table 5: Level of Independent Domain: Correlation Matrix

	Mobility	Activities-of-daily-living	Work-capacity	Dependence-on-medication-or-treatment
Mobility	1.000	.407	.327	-.038
Activities-of-daily-living	.407	1.000	.471	.087
Work-capacity	.327	.471	1.000	.065
Dependence-on-medication-or-treatment	-.038	.087	.065	1.000

Table 5 showed only a higher correlation between Activities of daily living and Work capacity. Rotated component matrix on the items revealed two components. The first component can be renamed into an "Activities of daily living Domain Scale" with a reliability test using cronbach's alpha of 0.668. While the second was identified by a single item named Dependence on Medication or treatment with factor loading 0.980. A reliability test was not carried out since it is a single item factor.

Social Relationship Domain

Table 6: Social Relationship Domain: Correlation Matrix

	Personal-relationships	Social-support	Sexual-activity	Social-inclusion
Personal-relationships	1.000	.232	.312	.168
Social-support	.232	1.000	.369	.092
Sexual-activity	.312	.369	1.000	.084
Social-inclusion	.168	.092	.084	1.000

Table 6 showed only a higher correlation between social support and sexual activity. The total variance explained revealed only a one-factor structure. Therefore, there was no Rotated component matrix since it is a single factor component. The four items were averaged into a "Social Relationships Domain Scale" with a reliability test using cronbach's alpha of 0.513.

Environmental Domain

Table 7: Environmental Domain: Correlation Matrix

	Physical-safety-&-security	Home-environment	Financial-resources	Health-&-social-care: accessibility-&-quantity	Oppurtunities-for-acquiring-new-informatn-&-skill	Participation-in-recreation/leisure-activities	Physical-environment-pollutn	Transport
Physical-safety-&-security	1.000	.276	.184	.252	.310	.191	.404	.173
Home-environment	.276	1.000	.254	.261	.068	.134	.210	.297
Financial-resources	.184	.254	1.000	.071	.109	.115	.068	.271
Health-&-social care: accessibility-&-quantity	.252	.261	.071	1.000	.246	.194	.291	.226
Oppurtunities-for-acquiring-new-informat-&-skill	.310	.068	.109	.246	1.000	.222	.302	.134
Participation-in-recreation/leisure-activities	.191	.134	.115	.194	.222	1.000	.196	.127
Physical-environment-pollutn	.404	.210	.068	.291	.302	.196	1.000	.144
Transport	.173	.297	.271	.226	.134	.127	.144	1.000

Table 7 showed only a higher correlation between physical safety and security and physical environment (pollution/noise/traffic/climate). Rotated component matrix on the items revealed two components. The first component can be renamed into a "Physical Environment Domain Scale" with a reliability test using cronbach's alpha of 0.625. While the second can be renamed into a "Financial Resources Domain Scale" with a reliability test using cronbach's alpha of 0.518.

Spirituality/ Religion/Personal Beliefs Domain

Table 8: Spirituality/Religion/Personal Beliefs Domain: Correlation Matrix

	Forgiveness-&blame	Concerns-about-the-future	Death-&-dying	SRPB
Forgiveness-&-blame	1.000	.321	.340	.024
Concerns-about-the-future	.321	1.000	.662	-.030
Death-&-dying	.340	.662	1.000	.056
SRPB	.024	-.030	.056	1.000

Table 8 showed a higher correlation between concerns about the future; and death and dying. Rotated component matrix on the items revealed two components. The first component can be renamed into a "Death and dying Domain Scale" with a reliability test using cronbach's alpha of 0.705. While the second was identified by single item SRPB with factor loading 0.997. A reliability

test was not carried out since it is a single item factor.

Summary of the WHOQOL-HIV Domains

The summary of the reliability values for each of the WHOQOL-HIV domains using the Cronbach's alpha scores are presented in Table 9.

Table 9: Reliability Tests on the six (6) domains

Domain	Factor 1	Factor 2	Total Factor
PHD	0.719	0.519	0.514
PSD	0.549		0.470
LID	0.668		0.422
SRD	0.513		0.513
END	0.625	0.518	0.655
SPD	0.705		0.581

Some domains after being broken into domain scales had high Cronbach's alpha reliability scores ranging from 0.513 for social relationships to 0.719 for physical domain (pain domain scale). The reliability scores for each domain as a single factor were less compared to when broken into domain scales.

IV. DISCUSSION

In this research, demographic factors were used to determine the impact of HIV/AIDs on the quality of life of people living with HIV/AIDs in Ondo and Ekiti State in the Western part of Nigeria. The effects of these factors varied from one domain to the other. People above 50 years have lower quality of life compared to younger people. While married people have better quality of life compared to the divorced, widowed and single. It was also revealed that people with up to four (4) children have better quality of life compared with people with less number or without children. The study also showed that level of education enhanced quality of life as people with tertiary education are better. Moreover, people who are employed have better quality of life than students. Access to medical aids and payment of medical expenses by the aids are also factors that have impact on the quality of life of PLWHA. It was also discovered that infected people in the study of interest are less bothered by the side effects of the virus on their bodies which consequently resulted to good overall quality of life despite their HIV status. These are consistent with the reports in the literatures (18, 19).

The identified factors in this study that contributed to poor QOL in PLWHA in the two states were variables with positively signed mean differences from the two instruments, that is, WHOQOL (BREF) and WHOQOL-HIV (BREF). The highest of those variables was pain and discomfort (2.282). Others include: dependence on medication or treatment, participation in leisure activities, home environment, mobility, sleep and rest, work capacity, body image and appearance and self-esteem. However, the following variables: thinking, learning, memory & concentration; energy & fatigue; sexual activity; and social support do not contribute to the quality of life of the population under study. The WHOQOL-HIV (BREF) was found to be reliable on the data used for this study. The study recorded high to moderate Cronbach's alpha scores when the domains were sub scaled for physical, environment and spirituality with 0.719, 0.625 and 0.705 scores respectively. This strong Cronbach's alpha scores indicated a high reliability of the research instruments and that the items were highly correlated. The reliability values noted in this study are comparable to those found in the original field test of the WHOQOL-HIV instrument [20] bearing in mind the number of questions in each domain of the BREF instrument. The original field study reported some relatively low Cronbach's alpha in specific subscales in the environmental and spirituality domains, while this study reported relatively high Cronbach's alpha in these domains. This may be unique to the population of study. The factor analysis also showed that almost all the domain had multiple dimensions. This finding is in line with the original instrument design as each domain is made up of multiple subscales or facets [20,21]. The factors identified in this study almost replicate those suggested in the original instrument.

V. CONCLUSION

The study has rekindled our awareness on the growing trend on the poor quality of life of PLWHA assessed in this study location using the Cronbach's alpha score. As discovered in this study, people who are living with the HIV/AIDs virus should be encouraged to get married and have children, get education and be employed as other members of the society to enhance their quality of life. The government should also continue to pay

for their medications as reflected in the prevalent rates of the two states. Factors found to contribute to poor quality of life could be reduced through regular counseling, proper diet and medication. The study also indicate that the people in this part of the globe place high priority on their spiritual and religion relationship. The instruments are adaptable to the environment from which the data were sourced.

VI. DATA AVAILABILITY STATEMENT

The data used to support the findings of this study are restricted by the Ondo State Ministry of Health and Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria in order to protect patient privacy. Data are available from Aladeniyi, O. B at obaladeniyi@futa.edu.ng for researchers who meet the criteria for access to confidential data.

Conflict of Interest
The authors have no conflict of interest on the work done.

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