

**Original Article****Open Access****Quality of life of people living with HIV and AIDS attending Irrua Specialist Teaching Hospital, Edo State, Nigeria**<sup>1</sup>Adewuyi, B. T., and <sup>\*2,3</sup>Adewuyi, G. M.<sup>1</sup>Department of Family Medicine, Irrua Specialist Teaching Hospital, Edo State, Nigeria<sup>2</sup>Department of Medical Microbiology & Parasitology, Irrua Specialist Teaching Hospital, Edo State, Nigeria<sup>3</sup>Department of Medical Microbiology & Parasitology, Ambrose Alli University, Ekpoma, Edo State, Nigeria\*Correspondence to: [gbolawuyi@yahoo.com](mailto:gbolawuyi@yahoo.com)**Abstract:**

**Background:** With the use of highly active antiretroviral therapy (HAART), life expectancy of HIV-infected persons had increased and the disease is now managed as a chronic one, but the quality of life (QOL) of the patients is now a concern. Social support enhances QOL of patients with chronic illnesses. However, no study has been done to determine the QOL of people living with HIV and AIDS (PLWHA) in our environment. This study therefore assessed the QOL of PLWHA attending antiretroviral therapy (ART) clinic of Irrua Specialist Teaching Hospital (ISTH), Edo State of Nigeria

**Methodology:** A descriptive cross-sectional study design was used. Two hundred and thirty PLWHA attending the ART clinic of ISTH, Irrua, Edo State, Nigeria, were systematically selected for the study. A structured questionnaire was interviewer-administered to collect data on sociodemographic and clinical profiles of selected participants, and the WHOQOL-HIV BREF questionnaire was used to collect data the QOL of each participant. Data were analyzed with IBM SPSS version 20.0.

**Results:** The overall mean QOL score for the participants was  $89.13 \pm 1.18$  (95% CI=87.95-90.31). The scores in three of the six life domains in the WHOQOL-HIV BREF instrument were similar and high; spirituality/religion/personal beliefs ( $16.33 \pm 0.36$ ), physical health ( $15.83 \pm 0.28$ ) and psychological health ( $15.07 \pm 0.24$ ). Lower mean QOL scores were observed in the social relationships ( $13.49 \pm 0.28$ ) and environment ( $13.45 \pm 0.20$ ) domains. Clinical HIV stage, marital status, educational status and gender were significantly associated with mean QOL scores in bivariate analysis while only HIV stage 1 and 2 were significantly associated with good QOL in multivariate logistic regression analysis.

**Conclusion:** It is pertinent that PLWHA are kept in early stages of HIV disease through combination of efforts such as prompt enrolment, commencement and monitoring compliance of HAART, and treatment of opportunistic infections, as well as public health measures including education, de-stigmatization, early diagnosis by extensive accessible screening/testing of at-risk population, social supports and economic empowerment, psychotherapy and social integration of affected individuals especially in a functional home.

**Keywords:** PLWHA, Quality of Life; HIV, HAART

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**Qualité de vie des personnes vivant avec le VIH et le SIDA fréquentant Hôpital Universitaire Spécialisé d'Irrua, État d'Edo, Nigeria**<sup>1</sup>Adewuyi, B. T., et <sup>\*2,3</sup>Adewuyi, G. M.<sup>1</sup>Département de Médecine Familiale, Hôpital Universitaire Spécialisé d'Irrua, État d'Edo, Nigéria<sup>2</sup>Département de Microbiologie Médicale & Parasitologie, Hôpital Universitaire Spécialisé d'Irrua, État d'Edo, Nigéria<sup>3</sup>Département de Microbiologie Médicale & Parasitologie, Université Ambrose Alli, Ekpoma, État d'Edo, Nigéria\*Correspondance à: [gbolawuyi@yahoo.com](mailto:gbolawuyi@yahoo.com)

## Résumé:

**Contexte:** Avec l'utilisation de la thérapie antirétrovirale hautement active (HAART), l'espérance de vie des personnes infectées par le VIH a augmenté et la maladie est désormais gérée comme une maladie chronique, mais la qualité de vie (QOL) des patients est désormais une préoccupation. Le soutien social améliore la qualité de vie des patients atteints de maladies chroniques. Cependant, aucune étude n'a été réalisée pour déterminer la qualité de vie des personnes vivant avec le VIH et le SIDA (PVVIH) dans notre environnement. Cette étude a donc évalué la qualité de vie des PVVIH fréquentant la clinique de thérapie antirétrovirale (ART) de l'hôpital d'enseignement spécialisé d'Irrua (ISTH), État d'Edo au Nigeria.

**Méthodologie:** Une conception d'étude transversale descriptive a été utilisée. Deux cent trente PVVIH fréquentant la clinique ART de l'ISTH, Irrua, État d'Edo, Nigeria, ont été systématiquement sélectionnées pour l'étude. Un questionnaire structuré a été administré par un intervieweur pour collecter des données sur les profils sociodémographiques et cliniques des participants sélectionnés, et le questionnaire WHOQOL-HIV BREF a été utilisé pour collecter des données sur la qualité de vie de chaque participant. Les données ont été analysées avec IBM SPSS version 20.0.

**Résultats:** Le score moyen global de qualité de vie des participants était de  $89,13 \pm 1,18$  (IC à 95% =  $87,95-90,31$ ). Les scores dans trois des six domaines de la vie de l'instrument WHOQOL-HIV BREF étaient similaires et élevés ; spiritualité/religion/croyances personnelles ( $16,33 \pm 0,36$ ), santé physique ( $15,83 \pm 0,28$ ) et santé psychologique ( $15,07 \pm 0,24$ ). Des scores moyens de qualité de vie inférieurs ont été observés dans les domaines des relations sociales ( $13,49 \pm 0,28$ ) et de l'environnement ( $13,45 \pm 0,20$ ). Le stade clinique du VIH, l'état matrimonial, le statut éducatif et le sexe étaient significativement associés aux scores moyens de qualité de vie dans l'analyse bivariée, tandis que seuls les stades 1 et 2 du VIH étaient significativement associés à une bonne qualité de vie dans l'analyse de régression logistique multivariée.

**Conclusion:** Il est pertinent que les PVVIH soient maintenues aux premiers stades de la maladie à VIH grâce à une combinaison d'efforts tels que l'inscription rapide, le début et le suivi de l'observance du HAART et le traitement des infections opportunistes, ainsi que des mesures de santé publique telles que l'éducation, la déstigmatisation, un diagnostic précoce par un dépistage/test accessible étendu de la population à risque, des soutiens sociaux et l'autonomisation économique, la psychothérapie et l'intégration sociale des personnes touchées, en particulier dans un foyer fonctionnel.

**Mots clés:** PVVIH, Qualité de Vie ; VIH, HAART

## Introduction:

The development of highly active anti-retroviral therapy (HAART) has shifted the perception of HIV/AIDS from an acute, fatal disease to a chronic and potentially manageable one (1). Antiretroviral therapy (ART) is capable of improving survival, reducing the occurrence of HIV-related opportunistic infections, improving patients clinical state and social capacity (1,2). Although HAART does not cure HIV disease, it significantly reduces the viral load and slows the progression of the disease, thereby increasing life expectancy of infected persons (2). Therefore, management of chronic debilitating diseases like HIV should aim not only at terminating disease progression and preventing death, but also at restoring or enhancing good quality of life (QOL) of affected individuals.

According to the World Health Organization (WHO), QOL is defined as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, standards, expectations and concerns" (3). There are a lot of advances in the medical management of HIV but the holistic support systems and QOL of these patients are often overlooked (4). The unwillingness to disclose HIV-sero-status due to associated social stigma and discrimination which in turn reduce health-seeking

behaviour and adherent to clinic attendance are still major problems compounding the QOL of PLWHA (5). Also, the side effects of HAART, if present can also affect the QOL of an individual, with the knowledge that the drugs must be taken throughout the lifetime of the individual (1). Therefore, assessment of QOL aiming to provide a comprehensive evaluation of the individual well-being, including an appraisal of their functional role within the family, community integration and personal adjustment to life circumstances is very paramount (6).

Quality of life is considered synonymous with health status, functional and psychological well-being, happiness with life, satisfaction of needs, and assessment of one's own life (3,7). There are six life domains identified in the assessment of QOL. These are physical health, psychological health, level of independence, social relationship, environment, and spiritual/religion/personal domains (3). When QOL is related only to physical well-being or to lack of diseases or symptoms, the other areas of an individual life such as work, family, social relationships or psychological wellbeing are not included (7).

From the early focus on only physical (medical) functioning, QOL has shifted towards a more holistic approach to including all aspects of individual life and wellbeing. Quality, rather than quantity of life, is of paramount

importance for the continuous integration of PLWHA into the society and maintenance of their roles and functions (8). Quality of life in PLWHA is influenced by satisfaction with social support and coping styles, and in chronic diseases like HIV, assessing QOL has become an integral part of follow-up as it provides valuable feedback about therapeutic interventions and are indispensable in cost effective analysis (9).

HIV/AIDS has such serious repercussions on psychological, social and physical well-being, that the assessment of QOL of PLWHA will help to measure the extent of re-integration into the society after the crises they face at initial diagnosis, thus enabling them to meet their daily responsibilities (10). Information such as this is important in the evaluation of the impact of the disease on health outcomes, the effect of intervention already on ground, as well as the planning of other interventions that will help to meet other unidentified needs of PLWHA and improve the QOL of Nigerians living with HIV and AIDS.

While there is abundance of information on QOL of PLWHA, the few studies done in Nigeria were conducted in urban settings. This is the first time that QOL of PLWHA at the ART clinic of the Irrua Specialist Teaching Hospital (ISTH) will be assessed, as no study on QOL has been conducted in the hospital since inception till date. As a result, this study will provide baseline information on the perceived QOL of PLWHA in this rural setting, which has among other effects, social implications on everyone, because a person's perception of wellbeing will determine the acquisition of habits related to tasks, employment and care of others. The aim of this study therefore is to assess the QOL of PLWHA who access care from the ART clinic of ISTH, and to identify factors affecting their QOL.

## Materials and method:

### Study setting and design

This study is a descriptive cross-sectional design conducted at the ART clinic of ISTH Irrua, Edo State, south-south geopolitical region of Nigeria which has the highest prevalence of HIV/AIDS (3.1%) in Nigeria (11).

### Study population and participants:

The study population were PLWHA attending the ART clinic of ISTH Irrua for treatment. Two hundred and thirty participants who have been on HAART for at least 12 months were recruited from the study population by systematic random sampling method. The criteria for exclusion were pregnancy and presence

of co-morbidities such as diabetes mellitus, depression, HIV-encephalopathy, obesity, seizure disorders and hypertension.

### Sample size and sampling technique:

The minimum sample size for the study was determined using the formula for proportion;  $n = z^2 pq / d^2$  (12), where 'n' is the desired sample size, 'z' is the normal standard deviation for the required level of confidence (1.96), 'p' is the estimated prevalence of 83% or 0.83 from a previous study (13), 'q' is 1-p and 'd' is the tolerable margin of error (set at 5% or 0.05). This gave a calculated sample size of 216, which was adjusted (based on 5% attrition rate) to 228, and rounded up to 230 HIV-infected adults as sample size for the study.

Eligible participants were consecutively recruited by systematic random sampling till the sample size was obtained. To calculate the k-value (i. e. sampling interval), the total number of adult PLWHA seen during the period of the study was divided by the sample size. The average number seen per month is 480, therefore, for a study that spanned over 3 months, the k-value was calculated as  $(480 \times 3) / 230$  or 6.26. This made every 6<sup>th</sup> adult participant who meets the eligibility criteria to be recruited for the study. The first participant was selected using a simple random sampling with ballot of numbers one to six. The second participant was randomly selected and subsequent participants were selected at interval of six. No participant was selected twice.

### Ethical consideration:

Ethical approval was obtained from the Ethical Review Committee of ISTH, Irrua and informed consent was obtained from each participant.

### Data collection:

Data collection was done using a two-sectioned structured-questionnaire, administered on consenting PLWHA who met the inclusion criteria for the study. The section A consisted of information regarding socio-demographic and clinical characteristics such as age, sex (gender), marital status, occupation, education level, place of residence, date of first enrolment, CD4 cell count, HIV status of partner, status disclosure and WHO clinical stage of participants. Section B contained a structured questionnaire for assessing QOL using the WHOQOL-HIV BREF instrument (14). WHOQOL-HIV BREF is a shorter version of WHOQOL-HIV instrument, which explores six domains of the QOL and a total of 31 questions for respondents to rate themselves on their QOL during the two weeks preceding the interview. Ans-

wers 1 to 5 were presented on a Likert scale, where 1 indicated low or negative perception and 5 indicated high or positive perceptions.

The six life domains identified in the WHOQOL-BREF instrument are; (i) physical health domain, which measures pain and discomfort, energy and fatigue, sleep and rest, with 4 questions (Q3,Q4,Q14,Q21); (ii) psychological health domain, which measures positive feelings, thinking, learning, memory and concentration, self-esteem, bodily image and appearances, and negative feelings, with 5 questions (Q6,Q11,Q15,Q24, Q31); (iii) level of independence domain which measures mobility and daily life activities, dependence on medications or treatments, and work capacity, with 4 questions (Q5,Q20,Q22,Q23); (iv) social relationship domain including personal relationships, social support and sexual activity, with 4 questions (Q17,Q25,Q26,Q27); (v) environment domain, which measures physical safety and security, home environment, financial resources, health and social care, accessibility and quality, opportunities for acquiring new information and skills, participation in and opportunities for recreation and leisure activities, and physical environment, with 8 questions (Q12, Q13,Q16,Q18,Q19,Q28,Q29,Q30); and (vi) spiritual/religion/personal beliefs domain, which measures forgiveness and blame, concerns about the future, and death and dying, with 4 questions (Q7,Q8,Q9,Q10). There was a general question on QOL, and another question on health in general, giving a total of 31 questions.

The score of the domains was obtained by multiplying the average score of the questions in the domain by 4, resulting in scores ranging from 4-20. The overall QOL score was obtained by the summation of the transformed scores from the six domains, resulting in scores ranging from 24-120. The higher the scores obtained, the better the QOL. Based on the Likert's scale, the QOL for each domain and the overall was categorized into five groups as shown in Table 1.

#### Statistical analysis of data:

After appropriate verification, the data were transferred into a master sheet and analyzed using IBM SPSS 20.0 software. Data collected from the study questionnaire were entered using numerical codes. Frequency distribution tables of variables were generated. Statistical comparison of variables was done using the Chi-squared test for categorical variables, and Students' 't' test (comparison of two means) and analysis of variance (comparison of more than 2 means) for continuous variables. A  $p$ -value of  $<0.05$  was considered statistically significant.

#### Results:

##### Sociodemographic characteristics of study participants:

The sociodemographic characteristics of the participants are as shown in Table 2 below. The ages range of the participants was 20 to 68 years, and the mean age is  $41.13 \pm 9.96$  years.

Table 1: Quality of life categories based on transformed scores

S/N	Category	Domain transformed score	Overall transformed score
1	Very poor	4.00	24.00
2	Poor	4.01 - 8.00	24.01 - 48.00
3	Neither poor nor good	8.01 - 12.00	48.01 - 72.00
4	Good	12.01 - 16.00	72.01 - 96.00
5	Very good	16.01 - 20.00	96.01 - 120.00

Table 2: Sociodemographic characteristics of PLWHA in Irrua Specialist Teaching Hospital, Edo State, Nigeria

Variables	Frequency	Percent
<b>Age group (in years)</b>		
20-29	25	10.9
30-39	83	36.1
40-49	69	30.0
50-59	45	19.6
60-69	8	3.4
<b>Age range (years)</b>	20-68	
<b>Mean age (<math>\pm</math>SD)</b>	41.13 $\pm$ 9.96	
<b>Age group (in years)</b>		
15-45 (reproductive age group)	159	69.1
46-64 (middle age group)	69	30.0
65 (elderly)	2	0.9
<b>Marital status</b>		
Married	138	60.0
Widow/widower	47	20.4
Single	26	11.3
Separated	14	6.1
Cohabiter	3	1.3
Divorced	2	0.9
<b>Gender</b>		
Male	62	27.0
Female	168	73.0
<b>Highest educational level</b>		
No formal education	13	5.7
Primary	75	32.6
Secondary	79	34.3
Tertiary	63	27.4
<b>Occupation</b>		
Artisan	23	9.9
Civil servants	28	12.2
Driving	4	1.7
Farming	29	12.6
Students	10	4.3
Tailoring	7	2.2
Teaching	5	3.0
Trading	97	42.4
*Others	12	5.2
Unemployed	15	6.5
<b>Religion</b>		
Christianity	218	94.7
Islam	12	5.3
Traditional/others	0	0

\*Others=Banker 1, Caterer 1, Clergy 1, Engineering 2, Industrialist 1, Journalist 1, Nurse 1, Policeman 2, Retired 2

### Clinical profiles of the participants:

The clinical profiles of the participants are as shown in Table 3. Using the WHO clinical staging of the participants, 174 (69.6%) participants were in stage 1, 32 (13.9%) in stage 2, 14 (6.1%) in stage 3, and 10 (4.3%) in stage 4. The CD4 cell count of 160 (69.6%) participants was  $\leq 500$  cells/mm<sup>3</sup> while count for the remaining 70 (30.4%) was  $>500$  cells/mm<sup>3</sup>. As regards duration on HAART, 171 (74.4%) participants had been on the ART drugs for 1-5 years,

58 (25.2%) for 6-10 years, while only 1 (0.4%) had been on the drug for up to 11 years.

The body mass index (BMI) was normal for 135 (58.7%) participants (18.5-24.9 kg/m<sup>2</sup>), 82 (35.6%) participants were overweight (BMI 25.0-29.9 kg/m<sup>2</sup>), while 13 (5.7%) were underweight (BMI  $< 18.5$  kg/m<sup>2</sup>). Two hundred and twenty-four participants (97.39%) had good adherence to antiretrovirals, while only 6 (2.61%) had poor adherence to medications (Table 3).

Table 3: Clinical profile of people living with HIV/AIDS in Irrua Specialist Teaching Hospital, Edo State, Nigeria

Variables	Frequency	Percent
<b>CD4 count (in mm<sup>3</sup>)</b>		
≤500	160	69.6
>500	70	30.4
<b>WHO HIV staging</b>		
Stage 1	174	75.7
Stage 2	32	13.9
Stage 3	14	6.1
Stage 4	10	4.3
<b>Duration on HAART</b>		
1-5 years	171	74.4
6-10 years	58	25.2
≥11 years	1	0.4
<b>BMI</b>		
Underweight <18.5kg/m <sup>2</sup>	13	5.7
Normal (18.5 to 24.9kg/m <sup>2</sup> )	135	58.7
Overweight (25.0 to 29.9kg/m <sup>2</sup> )	82	35.6
<b>Adherence to HAART</b>		
Good	224	97.39
Poor	6	2.61

BMI=Body mass index; HAART=Highly active ant-retroviral therapy; HIV= Human immunodeficiency virus; AIDS=Acquired immune deficiency syndrome; CD=Cluster of differentiation; WHO=World Health Organization

Table 4: Mean quality of life scores of PLWHA in Irrua Specialist Teaching Hospital, Edo State, Nigeria

Variables	Mean (± SE) quality of life scores	95% CI
Physical Health Domain	15.83±0.14	15.55 - 16.11
Psychological Health Domain	15.07±0.12	14.93 - 15.29
Level of Independence Domain	14.95±0.13	14.69 - 15.21
Social Relationship Domain	13.49±0.14	13.21 - 13.76
Environment Domain	13.45±0.10	13.25 - 13.65
Spiritual/Religion/Personal Beliefs Domain	16.33±0.18	15.97 - 16.69
<b>Overall</b>	<b>89.13±0.59</b>	<b>87.95 - 90.31</b>

SE=standard error; CI = Confidence interval

#### Mean quality of life scores of participants:

Table 4 shows the mean QOL scores of participants for each domain and the overall QOL score. The mean QOL score for; (i) physical domain at 95% confidence interval (CI) was 15.83±0.28; (ii) psychological domain 15.07±0.24; (iii) level of independence domain 14.95±0.26; (iv) social relationship domain 13.49±0.28; (v) environment domain 13.45±0.20; and (vi) spiritual/religion/personal beliefs domain 16.33 ± 0.36. The overall QOL score was 89.13±1.18.

#### Association of socio-demographic factors with quality of life among participants:

The difference in the mean QOL scores with respect to the age of participants was statistically significant only in the social domain,

with participants in the reproductive age group (15-45 years) having the highest mean QOL score of 13.71±2.29 ( $p=0.04$ ) (Table 5). Male participants had higher overall QOL scores and mean QOL scores in all the domains than their female counterparts. The overall mean QOL score of 91.75±8.39 for males was significantly higher than 88.16±8.90 for females ( $t=7.496$ ;  $p=0.007$ ). The mean QOL score was significantly higher for males ( $p<0.05$ ) in 4 of the 6 domains (psychological, level of independence, social and environment).

Concerning marital status of the participants, co-habitors, married participants and divorcees had significantly higher overall mean QOL scores (91.93 ± 9.41, 90.87 ± 8.90 and 90.30 ± 7.64 respectively), than the mean QOL

scores of separated, single and widowed participants ( $84.75\pm 8.31$ ,  $84.75\pm 8.32$ , and  $88.12\pm 8.93$  respectively) ( $F=4.033$ ,  $p=0.002$ ) (Table 5). However, there was no statistically significant difference in the overall mean QOL scores of employed ( $89.14\pm 8.86$ ) and unemployed participants ( $88.95\pm 10.20$ ) ( $t=0.01$ ;  $p=0.937$ ), and no significant difference in any of the six domains ( $p>0.05$ ).

With respect to education, participants with no formal education had the highest overall QOL ( $96.42\pm 4.65$ ), followed by those without secondary education ( $89.87\pm 8.67$ ) and the least was those with primary school education

( $85.74\pm 9.55$ ). Those with tertiary education had the highest QOL scores in all the domains except in the social relationship and spirituality/religion/belief domains, where those with secondary and no formal education had the highest scores respectively (Table 5). Although, the participants who practice Islamic religion had a higher overall mean QOL scores ( $91.7\pm 10.17$ ) than those who practice Christianity ( $88.93\pm 8.86$ ), the difference was not statistically significant ( $t=1.05$ ,  $p=0.307$ ), and there was also no significant difference in the QOL scores for the participants in all the domains with respect to religion ( $p>0.05$ ).

Table 5: Association of sociodemographic factors with quality of life of PLWHA in ISTH Irrua, Edo State, Nigeria

Variables	Q0	Q1	Q2	Q3	Q4	Q5	Q6
<b>Age group (years)</b>							
15-45							
46-64	89.52±8.55	15.15±2.15	14.98±1.98	14.58±1.22	13.71±2.29	13.47±1.25	16.01±1.77
≥65	88.96±9.68	15.75±2.32	14.86±1.99	14.86±1.68	13.09±2.09	13.38±1.84	16.90±2.24
	84.96±16.33	15.00±3.53	15.02±1.03	13.50±3.53	11.50±2.12	14.25±0.35	15.00±5.66
F	0.44	0.90	0.108	229	3.262	4.000	0.671
p	0.0643	0.103	0.898	0.796	0.040*	0.671	0.092
<b>Gender</b>							
Male	91.75±8.39	16.22±1.87	15.56±1.83	15.50±1.64	14.01±2.51	13.76±1.47	16.73±2.50
Female	88.16±8.90	15.70±2.30	14.72±1.99	14.92±1.88	13.29±2.01	13.34±1.42	16.19±2.71
t	7.49	2.42	8.40	4.57	5.10	4.037	1.84
p	0.007*	0.12	0.004*	0.034*	0.025*	0.046*	0.176
<b>Marital status</b>							
Cohabiting	91.93±9.41	16.00±3.61	16.27±2.31	16.33±2.08	13.33±1.15	14.00±0.50	16.00±2.54
Divorced	90.30±7.64	17.50±3.54	16.80±3.39	15.60±0.00	9.00±2.83	15.50±4.24	15.50±2.12
Married	90.87±8.90	16.26±2.05	15.22±2.03	15.82±1.83	14.02±2.02	13.53±1.46	16.50±2.73
Separated	85.20±8.15	15.43±1.95	14.23±1.64	14.64±1.59	11.57±2.06	12.75±1.29	17.07±1.86
Single	84.75±8.31	15.76±1.88	15.38±1.40	15.61±1.47	13.08±2.43	13.86±0.96	15.50±3.24
Widow/Widower	88.12±8.93	14.68±2.39	13.95±1.79	14.04±1.92	12.91±1.87	13.07±1.41	16.33±2.66
F	4.033	4.22	4.43	0.14	7.24	2.82	0.93
p	0.002*	0.001*	0.001*	0.984	0.0001*	0.017*	0.465
<b>Employment status</b>							
Employed	89.14±8.86	15.86±2.19	14.98±1.95	14.95±2.23	13.47±2.17	13.42±1.46	16.36±2.63
Unemployed	88.95±10.20	15.47±2.42	14.54±2.35	15.46±2.24	13.73±2.31	13.90±1.18	15.93±3.12
t	0.01	0.46	1.01	0.07	0.21	1.54	0.36
p	0.937	0.499	0.317	0.795	0.651	0.216	0.547
<b>Educational status</b>							
None	96.42±4.65	16.31±1.75	15.20±1.03	15.23±1.54	13.15±1.63	13.15±1.55	17.38±1.76
Primary	85.73±9.55	15.18±2.53	14.40±2.25	14.46±2.07	12.72±2.17	13.06±1.68	15.86±2.93
Secondary	89.87±8.67	16.00±1.99	15.14±1.81	15.15±1.66	14.01±2.12	13.47±1.40	16.10±2.75
Tertiary	89.13±8.92	16.31±1.96	15.31±1.88	15.65±1.61	13.48±2.18	13.96±1.07	16.96±2.20
F	6.49	3.64	3.02	4.91	5.5	4.83	2.91
p	0.001*	0.013*	0.031*	0.003*	0.001*	0.035*	0.0001*
<b>Religion</b>							
Christianity	88.93±8.86	15.82±2.19	14.91±1.96	14.58±2.11	13.47±2.17	13.45±1.44	16.28±2.67
Islam	91.70±10.17	16.16±2.44	15.53±1.92	15.33±1.92	13.83±2.41	13.50±1.58	17.33±2.38
t	1.05	0.28	1.11	0.05	0.32	0.01	1.79
p	0.307	0.598	0.294	0.817	0.572	0.908	0.182

Q0=Mean (±SD) Quality of Life Overall Scores; Q1=Mean (±SD) of Physical Health Domain Score; Q2=Mean (±SD) of Psychological Health Domain Score; Q3=Mean (±SD) Level of Independence Domain Score; Q4=Mean (±SD) of Social Relationship Domain Score; Q5=Mean (±SD) of Environment Domain Score; Q6=Mean (±SD) of Spiritual/Religion/Personal Beliefs Domain Score; F=ANOVA; t=Student t test; p=likelihood/probability; \*=statistically significant

### Association of HIV management care with quality of life of the participants:

The overall mean QOL scores of those who disclosed their HIV status to their partners (89.84±9.65) and those who concealed it from their partners (89.61±8.37), were not significantly different ( $t=1.05$ ,  $p=0.308$ ), and also across all the domains. The overall mean QOL scores of concordant partners, discordant partners and undefined group were not significantly different ( $F=0.16$ ,  $p=0.850$ ), and across all the domains. Irrespective of the CD4 counts, all the participants had similar QOL scores in all the domains, therefore CD4 counts had no sig-

nificant impact on the QOL of the participants.

The overall QOL scores of participants decreases as the WHO clinical stage increases. Participants in WHO stage 1 had the highest QOL scores (90.36±7.61), followed by those in WHO stage 2 (88.34 ± 8.53), while those in stage 4 had the least QOL score (76.73±5.71) ( $F=9.94$ ,  $p=0.0001$ ). The pattern is similar in all the 6 domains ( $p<0.05$ ). Irrespective of the duration on HAART, QOL scores of all the participants were similar across the domains. There was no statistically significant impact of length of time for HAART on the QOL among the participants ( $p>0.05$ ) (Table 6).

Table 6: Association of HIV management care with quality of life of PLWHA in ISTH Irrua, Edo State, Nigeria

Variables	Q0	Q1	Q2	Q3	Q4	Q5	Q6
<b>HIV status disclosure</b>							
Yes	89.84±9.65	15.94±2.88	15.01±2.29	15.17±2.01	13.46±1.46	13.44±1.45	16.51±2.75
No	89.61±8.37	15.77±2.11	14.90±1.73	15.79±2.14	13.43±1.45	13.47±1.44	16.21±2.66
<i>t</i>	1.05	0.32	0.19	0.71	3.04	0.02	0.72
<i>p</i>	0.308	0.568	0.660	0.400	0.083	0.876	0.398
<b>HIV status of partner</b>							
Positive	89.40±9.95	15.88±2.36	14.85±2.41	15.09±2.07	13.71±2.07	13.35±1.42	16.51±2.80
Negative	89.27±8.61	15.79±2.12	15.15±2.07	14.98±2.07	13.43±2.41	13.55±1.57	16.03±2.93
Unknown	88.58±8.03	15.85±2.13	14.78±1.70	14.91±1.87	13.27±1.98	13.31±1.28	16.40±2.02
<i>F</i>	0.16	0.04	0.76	0.84	0.74	1.31	0.88
<i>p</i>	0.850	0.966	0.469	0.433	0.477	0.273	0.561
<b>CD4 count (mm<sup>3</sup>)</b>							
≤500	88.46±9.70	15.71±2.34	14.86±2.20	15.05±1.22	13.33±2.28	13.39±1.56	16.18±2.83
>500	90.66±6.67	16.21±1.83	15.15±1.35	15.25±1.53	13.84±1.88	13.58±1.14	16.68±2.19
<i>t</i>	2.97	1.74	1.09	0.43	2.71	0.85	1.76
<i>p</i>	0.086	0.188	0.298	0.513	0.101	1.756	0.786
<b>HIV stage</b>							
Stage 1	90.36±7.61	16.10±1.94	12.48±2.88	14.77±1.47	13.72±2.10	13.52±1.34	16.60±2.48
Stage 2	88.34±8.53	15.62±2.25	13.88±2.44	15.09±1.69	13.00±2.28	13.56±1.44	15.94±2.82
Stage 3	84.44±11.17	14.64±3.03	15.13±2.14	14.21±2.29	13.07±1.07	13.79±1.37	14.86±3.01
Stage 4	76.73±5.71	13.60±3.27	15.14±1.73	12.60±3.02	11.50±2.51	11.45±1.91	15.10±3.73
<i>F</i>	9.94	6.15	7.83	0.11	4.35	7.41	3.04
<i>p</i>	0.0001*	0.0001*	0.0001*	0.0001*	0.005*	0.0001*	0.030*
<b>Duration on HAART (years)</b>							
<1	86.37±10.56	15.29±1.99	15.00±2.35	14.58±2.09	12.58±2.92	13.55±1.62	15.35±3.06
1-5	89.32±8.75	15.93±2.13	15.07±1.87	15.03±3.12	13.53±2.19	13.42±1.46	16.23±2.73
6-10	89.35±8.98	15.75±2.45	14.60±2.14	15.03±1.96	13.63±1.87	13.48±1.36	16.84±2.27
≥11	89.12±8.39	15.84±2.02	14.94±1.98	13.00±0.08	13.00±0.07	15.00±0.17	19.00±0.14
<i>F</i>	0.643	0.753	0.077	0.165	1.099	0.433	3.04
<i>p</i>	0.588	0.522	0.508	0.920	0.350	0.729	0.030*

Q0=Mean (±SD) Quality of Life Overall Scores; Q1=Mean (±SD) of Physical Health Domain Score; Q2=Mean (±SD) of Psychological Health Domain Score; Q3=Mean (±SD) Level of Independence Domain Score; Q4=Mean (±SD) of Social Relationship Domain Score; Q5=Mean (±SD) of Environment Domain Score; Q6=Mean (±SD) of Spiritual/Religion/Personal Beliefs Domain Score; HAART=Highly active ant-retroviral therapy; HIV=Human immunodeficiency virus; AIDS=Acquired immune deficiency syndrome; CD=Cluster of differentiation; F=ANOVA; *t*=Student *t* test; *p*=likelihood/probability; \*=statistically significant

Table 7: Multivariate logistic regression analysis of participants characteristics with quality of life

Characteristics	$\beta$ value	Odds ratio (95% CI)	p value
<b>Gender</b>			
Female	Reference group		
Male	2.64	14.070 (0.440 - 447.800)	0.134
<b>Marital status</b>			
Married	Reference group		
Single	-15.01	0.000 (0.000-)	0.999
Widow	-17.10	0.000 (0.000-)	1.000
Divorced	-0.74	0.480 (0.055-4.142)	0.503
Separated	-0.79	2.210 (0.057-85.36)	0.670
Cohabiting	-0.20	1.230 (0.086-17.43)	0.880
<b>Educational status</b>			
No formal education	Reference group		
Primary	-18.01	0.00 (0.00-)	0.999
Secondary	-0.85	2.33 (0.15-36.02)	0.554
Tertiary	1.66	5.25 (0.33-81.73)	0.236
<b>WHO HIV staging</b>			
Stage 1	Reference group		
Stage 2	-4.99	0.007 (0.001-0.075)	0.0001*
Stage 3	-3.79	0.023 (0.001-0.402)	0.01*
Stage 4	-2.26	0.105 (0.007-1.484)	0.095

Cox Snell  $R^2=11.7\%$ ; Nagelkerke  $R^2=41.5\%$ ; Chi-squared=3.048; df=3;  $p=0.931$ ;  
CI=confidence interval; \*=statistically significant

### Multivariate logistic regression analysis of participant characteristics on quality of life:

The characteristics of the participants significantly associated with QOL scores on ANOVA and the Students' 't' tests i. e. gender, marital status, educational status and WHO staging were entered into multivariate logistic regression analysis model. Only WHO stage 1 and stage 2 were significantly associated with QOL on this model. The  $\beta$  value, represents the slope of the regression line, the variables bearing negative values, indicate that the higher the value of these variables, the higher the likelihood of having poor QOL (Table 7).

### Discussion:

The introduction of HAART has led to increased life expectancy of PLWHA such that HIV infection is now being managed as a chronic disease and the QOL of the patients is now a significant consideration. Evidences are in support of improved QOL of patients with chronic illnesses including HIV/AIDS patients when there is adequate comprehensive healthcare addressing physical, social and psychological needs of affected individuals (8,15). This study investigated the QOL of PLWHA attending ART clinic in ISTH with focus on factors affecting QOL among these patients in a rural setting.

Of the 230 participants who met the inclusion criteria and were recruited into our study, 168 (73.0%) were females while 62 (27.0%) were males. This gender distribution is a reflection of the population of the clinic

attendees, similar to the gender distribution in other studies reported by Fatiregun et al., (7) in Kogi State, Samson-Akpan et al., (16) in the southern senatorial district of Cross River State, and Azuka (17) in Benin-City, Edo State, Nigeria (17). This may be attributed to that fact that females have better health-seeking behaviour than males or have more time to attend clinics, while men are struggling to meet economic needs of the family (18,19,20).

The age range of the participants was 20-68 years, with a mean age of  $41.13 \pm 9.96$  years. Sixty-nine-point one percent (69.1%) of the participants were within the reproductive age group which has been confirmed in the literatures to be the age group with highest prevalence of HIV/AIDS (21,22). Only 2 (0.9%) were elderly, probably because of the reduced life expectancy of HIV patients relative to the general population as a result of weaker immunity with age, higher susceptibility to opportunistic infection and social and psychological challenges of the disease (22,23,24).

Only 13 (5.7%) of the participants had no formal education. Majority of them had either primary or secondary education while 63 (27.4%) had tertiary education training. This is similar to educational distribution reported by Fatiregun et al., (7) although, there were more illiterate participants in their study, and also similar to findings of the studies of Azuka (16) and Samson-Akpan et al., (16). Most of the participants in our study were Christians (94.7%) probably because the study site is located in a Christian dominated Esan land of

Edo State, Nigeria. The few Muslims (5.3%) were from the Etsako area of the State, dominated by Islamic religion. Despite the skewed statistics, there was no statistically significant difference between the two groups; and religion has no impact on QOL of participants in this study.

All the participants had been on HAART for at least 12 months prior to recruitment for this study, in order to exclude the initial shock or depression associated with early period of being HIV-diagnosed and to allow for beneficial effects of HAART. Choosing this category of participants also eliminates the initial challenges associated with initiating patients on HAART (adverse drug reactions) before the patients psychologically and physically adjusted. Most of the participants were in WHO stage 1 and 2 of HIV classification. This may partly be due to the exclusion of those with co-morbidities, as the 3<sup>rd</sup> and 4<sup>th</sup> stages are associated with many HIV/AIDS associated comorbidities; and partly due to good comprehensive HIV treatment, care and support services being provided at the study site.

In this study, PLWHA had good overall mean QOL score ( $89.13 \pm 0.59$ ). This is similar to the findings of other researchers within and outside Nigeria, (1,3,7,16,17) where PLWHA had good QOL. The good QOL score in this study can be attributed to the use of ART and good adherence in all the patients studied for at least 12 months as reported. Oguntibeju (1) in a review article and Sophie et al., (9) in a Cochrane study observed that, several studies reported a strong positive association between ART and improved quality of life in different domains among PLWHA in both developed and developing countries (1). In addition, the good QOL of participants in this study may be partly due to sufficient time for recovery from the initial shock, denial and depression associated with being diagnosed HIV seropositive. Regular clinic attendance for 12 months and above, also provides opportunities for listening to health talks and meeting other HIV positives clients, these experiences can foster hope and ultimately improve the QOL of these patients as was reported by Sushil Yadav in PLWHA in Nepal (25). In addition, similarity in the QOL of participants in the study and those studies done in urban center of Nigeria, revealed that, use HAART irrespective of location of the PLWHA is important in QOL improvement of the affected individuals.

The highest mean QOL score was seen in the spiritual/religion/personal beliefs domain, followed by the physical health domain and the psychological health domain. This is similar to

the findings of other researchers, especially Fatiregun et al., (7), Folasire et al., (4) and Samson-Akpan et al., (16). The high mean QOL score in the spiritual/religion/personal beliefs domain may be due to increase God-seeking behaviour and piety associated with encounters which are irreversible like HIV/AIDS and ultimately can lead to death. Boppana and Gross (25) and Villani et al., (26) observed that significant number of their patients reported an increase in spirituality/religiosity post-HIV diagnosis, aside of Nigeria being a highly religious country (27). Religiosity can impact on psychic and physical well-being of patients.

The high mean QOL score in the physical domain can also be attributed to ART capability to improving survival, reducing the occurrence of HIV-related opportunistic infections, and improving patients' clinical state and thus physical wellbeing (25,26). The environment domain had the lowest mean QOL score followed by social relationship domain. This may be because PLWHA face various social and environmental problems, such as stigmatization, discrimination, poverty, and cultural beliefs, which can affect their QOL socially, leading to problems that affect important activities and interests of the persons (1) These findings are in consonance with those of Fatiregun et al., (7) study, which also highlighted low mean scores in environment domain. Similar results were also reported in Sao Paulo, Brazil (28), where the mean scores for social relationship and environment domains fell in the intermediate level.

Environment domain measures financial resources, freedom, physical safety and security, health and social care; accessibility and quality, home environment, opportunity for acquiring new information and skills, participation in and opportunities for recreation/leisure activities, physical environment (pollution/noise/traffic/climate) and transport (13). The results indicating low scores for environment in this study may imply lack of money and poor living conditions since most of the respondents were of primary and secondary school level, living in rural communities of Edo State, whose earnings may not be adequate for personal and social needs. Being employed provides some level of financial independence and thus reduces some of the stresses on them. Good clinical stage in most of these participants may make their HIV status obscured except they disclosed it. This in turn reduces chances of stigmatization, discrimination and other psychosocial negative effects of HIV on their relationship with other family members.

In the bivariate analysis in this study,

only four factors had impact on the participants' QOL. These are gender, marital status, level of education and the WHO HIV clinical stage. These factors were among those identified by other researchers to influence QOL of HIV patients (1,7,9). Men had better QOL in all the domains and overall, except in the spiritual/religion/belief domain. The odds of a male having good QOL life is 14.07 times higher than a female having good QOL. This may not be unconnected to the superior socio-psychological position and stronger economic strength of men in the society relative to their female counterparts (29). Our study is at variance with the findings of Fatiregun et al., (7), who reported that women had higher QOL score compared to men in virtually all domains, and significantly higher level on the independent domain. The men had better QOL in our study, probably because they have equal access to all health-promoting factors such as HAART, care, and support, like the women, and extra advantage of being more empowered by tradition, and being less exposed to intimate partner violence and rejection than women. The findings on gender in our study also differs from the report of Samson-Akpan et al., (16) in southern senatorial district of Cross River State, where gender difference was reported to be insignificant. The disparities in the studies may due to some sociodemographic differences and methodology of the studies. For instance, the selection of participants in the Samson-Akpan et al., (16) study was based on purposive sampling on the basis of regular participation at group meetings, which may have biased participants selection. The higher QOL of women reported in their study is not surprising as women are known to be more religious and resort to faith, than men.

With regards to marital status of the participants as significant factor impacting on QOL in this study, cohabiters, married and divorcees had higher mean QOL scores than widows and singles in almost all the domains. The regression analysis showed very bad QOL prognosis for widow/widower and the singles. The  $\beta$  value representing the slope of the regression line for the variables bearing negative values, indicate that the higher the value of these variables the higher the likelihood of having poor quality of life. A stable relationship conceivably contributes to a good QOL. This was shown convincingly in almost all domains in this study and other studies (30,31). Conflicting results were found with respect to changes in QOL over time. In women, being single was associated with an improvement in QOL after four months, whereas being married

was associated with a decline (9). Being chronically ill possibly causes more health distress and anxiety in married women, since the illness can interfere with their role as a spouse. However, a stable partner was also found to be positively associated with mental health after one year (31).

Among socioeconomic variables, having no formal education or having any level of education appeared to have effect on QOL in all domains. However, regression analysis revealed that level of education has no significant associated with QOL of PLWHA. Good education is expected to enhance acquisition of health promoting information on internets and other resource materials (31) and adherence to HAART (13,30) as well as other health promoting activities. It also often implies higher income and thus better living conditions and health (3). However, this study is at variance to other studies cited. This may be due to high level of awareness in the study area (32), as only 5.7% of the participants have no formal education. In Edo state, even an illiterate can communicate well in 'pigin-english', hence they can comprehend health education and clinical instructions very well.

The strongest factor determining good QOL is WHO clinical stage 1 or 2, which was the only variable with strong association on logistic regression model. An objective of HAART is to enhance the clinical stage and delay progression into late stages of the disease. A result other than this is tantamount to treatment failure if adherence is not compromised, since clinical failure lags behind virologic and immunologic failures. This findings is similar to reports of review and cochrane studies on QOL of PLWHA (1,9).

## Conclusion:

Quality of life in PLWHA is influenced ultimately by just one factor; the WHO Clinical stage of the PLWHA. Good QOL is obtained and maintained by being in early WHO clinical stage i. e. stage 1 and 2. It is therefore very pertinent that PLWHA are kept in the early stages of the disease. This is achievable by combination of efforts and actions such as intense public awareness and public health education on HIV/AIDS, de-stigmatization of the disease and elimination of discrimination against PLWHA; early diagnosis by extensive accessible screening/testing of at risk population; prompt enrolment of HIV-seropositive persons into care; quick commencement of HAART with strong emphasis on adherence counseling; monitoring

adherence; managing side effects promptly and switching drugs when necessary; continuous regular clinical, immunologic and virologic monitoring and reevaluation of patients; as well as prompt diagnosis and treatment of opportunistic conditions associated with the disease. Furthermore, social supports, economic empowerment, psychotherapy and social integration of affected individuals, especially in a functional home will go a long way in enhancing the QOL.

### Contributions of authors:

ABT conceived the idea and conceptualized the study, AGM coordinates and heads the HIV/AIDS program of the institution directly managing the patients. The two authors were involved in literature search, development of research proposal, data collection and analysis, and writing of manuscript for publication.

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There is no conflict of interest.

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