

# Health-Related Quality of Life of Patients on Antiretroviral Therapy at the Federal Medical Center, Makurdi, Nigeria

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## Abstract

**Context:** Health related quality of life (HRQL) indices could provide information about the effects of disease progression and the effectiveness of medical interventions that cannot be obtained using objective clinical measures. **Aim:** The aim of this study is to assess HRQL of patients on highly active antiretroviral therapy (HAART) at the Federal Medical Center, Makurdi in North Central Nigeria. **Settings and Design:** The study was a cross-sectional survey among people living with HIV/AIDs (PLWHAs) on HAART. **Methods:** The 546 PLWHAs on HAART were selected using systematic sampling technique. A modification of the 36-Item Short-Form Health Survey Version 2 questionnaire was used to assess respondents' HRQL in eight dimensions: Physical functioning (PF), role-physical (RP), role-emotional (RE), social functioning (SF), bodily pain (BP), vitality (VT), mental health (MH), and general health (GH). Data generated after measuring and scoring HRQL using standard methods were analyzed using the SPSS 17. **Results:** Good HRQL ratings included: PF (98.9%), RE (98.7%), SF (98.2%), VT (96.9%), RP (96.5%), MH (96.3%), BP (94.1%), and GH (93.4%). Predictors of good HRQL were as follows: Age <40 years (odds ratio [OR] = 4.26, confidence interval [CI] = 1.49–12.11) and being currently employed (OR = 3.20, CI = 1.08–9.49) (RP); and having a caregiver (OR = 4.94, CI = 1.33–18.27). Predictors of less likelihood of good HRQL were: Enjoying social support (OR = 0.12, CI = 0.03–0.55) (RP; MH); being without spouse/partner (OR = 0.43, CI = 0.21–0.91) (GH). **Conclusions:** HAART improves HRQL of HIV patients. Clinicians need to be responsive to factors related to disclosure, having a caregiver, and social support as a means of improving HRQL.

**Keywords:** Health-related quality of life, highly active antiretroviral therapy, HIV, Makurdi

## INTRODUCTION

The HIV pandemic is one of the world's most serious public health problems in human history, as it affects all areas of life including health, education, agriculture, and social life. Nigeria ranks the third globally in the absolute numbers of people infected with the virus despite a relative decline in prevalence rates from 5.8% in 2001 to 3.4% in 2012.<sup>[1]</sup> The advent of antiretroviral therapy (ART) using highly active antiretroviral regimen was the most significant intervention ever put in place to fight the scourge of HIV in its nearly four decades of existence, the target of placing 90% of people living with HIV/AIDs (PLWHAs) on ART is achievable and being pursued as a global goal. Although ART has turned HIV into a manageable chronic disease for millions of people worldwide and dramatically reduced deaths from HIV, the physical, social, and economic challenges associated with ARVs adherence is likely to lead to treatment failure,

the emergence of drug resistant and eventual poor health outcomes.

The assessment of medical interventions has conventionally focused on biological outcomes such as symptoms, survival, disease progression, disability, morbidity, and mortality.<sup>[2]</sup> However, health-related quality of life (HRQL) is equally an important measure of self-reported health status and well-being,<sup>[3]</sup> and it is increasingly being recognized as a supplement to the traditional biological endpoints.<sup>[2,4]</sup> HRQL

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provides information about the effects of disease progression and the effectiveness of medical interventions that cannot be obtained using objective clinical measures.<sup>[5,6]</sup> It could use physical health, mental and general health (GH) indices, and dimensions to compute quality scores; in which case higher scores and ratings for the different dimensions represent good or better HRQL for the dimension being measured; whereas lower scores and ratings represent poor or worse HRQL.

Since the goals of ART are not limited only to achieving viral suppression, immunologic recovery, clinical benefits, increased survival, and reduced HIV transmission, but rather, to the overall improved quality of life of patients.<sup>[4,7]</sup> HRQL is considered to be an important quality of care indicator for HIV/AIDS.<sup>[8]</sup> Studies conducted among PLWHA in several countries including Nigeria, have demonstrated variations in scores and ratings of the different HRQL dimensions assessed; as well as variations in associations between patient characteristics and HRQL dimensions. The possibility of patient's socio-demographic and clinical characteristics influencing HRQL scores cannot be underestimated.

### Current study

For effective management of HIV, an assessment of a comprehensive set of disease outcomes is desired. HRQL indices could provide information about the effects of disease progression and the effectiveness of medical interventions that cannot be obtained using objective clinical measures. The scoring and ratings of HRQL dimensions adopted in this study would throw more lights on the effect of ART on HRQL among people living with HIV in the study area. This study will form a baseline for future comparisons of HRQL outcomes among PLWHAs. It will also provide information that will be used to guide targeted clinical decision-making to optimize long-term HRQL of adult patients on ART. The objective of this study was to assess HRQL of patients on highly active ART (HAART) at the Federal Medical Center (FMC), Makurdi in North Central Nigeria.

## METHODS

### Study area

The study site was the ART clinic of the FMC, Makurdi, Nigeria. At the time of the study period, there were about 13,450 adult patients receiving ART at this clinic. The FMC, Makurdi, is a tertiary health institution with a 400-bed capacity and occupancy rate of approximately 95% at any given time. The study area, in which the health facility resides, is Benue State, in the North Central geo-political zone of Nigeria, and it is the state with the persistently highest prevalence of HIV infection in Nigeria since the beginning of the epidemic.

### Study design and scope

The study was a descriptive, cross-sectional survey which was conducted to assess self-reported HRQL of patients receiving ART at the FMC, Makurdi, Nigeria. HRQL was assessed in eight domains: Physical functioning (PF), role limitations due to physical health problems, role limitations due to emotional

problems, social functioning (SF), pain, vitality (VT) (energy/fatigue), emotional well-being, and GH perceptions.

### Study population

The study population comprised adult HIV patients aged  $\geq 18$  years and on first-line ART regimens for at least 12 months. Patients on second line and salvage therapy were excluded from the study.

### Sample size estimation

The minimum sample size required was estimated using the formula for descriptive, cross-sectional surveys of single proportion population  $n = z^2pq/d^2$ .<sup>[9]</sup> At the time of the study, there was no readily available Nigerian literature that provided proportion of patients on first-line HAART with good HRQL. Therefore, 50% was used in the sample size calculation: Giving a calculated sample size of 384 that was increased to 482 to compensate for nonresponse.

### Sampling method

Patients were selected by a systematic sampling technique. Usually, about 150–200 patients are seen on each clinic day. With a calculated sample size of 482, this gave a sampling interval of 3.21 (for 150 patients) and 2.41 (for 200 patients). This was approximated to a sampling interval of 3. On the 1<sup>st</sup> day of data collection, the second out of the first three patients as they were listed in the clinic register, was selected by simple balloting; and this became the starting point. Then after, every third patient as listed in the clinic register was selected and recruited on every interview day. Adult clinic days were Mondays, Wednesdays, and Fridays, and the clinic registers on those days was used to select participants.

### Instrument and measures

The instrument used for measuring HRQL was a modification of the 36-Item Short Form Health Survey version 2 (English Version, SF-36v2 Health Survey Standard, United States). The modified questionnaire was pretested among PLWHAs in the ART clinic of a nearby hospital, and who were not included in the survey. Internal consistency reliability tests were also performed on the pretested questionnaires. Cronbach's alpha ( $\alpha$ ) coefficient was 0.85, 0.95, 0.82, 0.70, 0.75, 0.72, 0.53, and 0.73, for PF, role-physical (RP), role-emotional (RE), VT, mental health (MH), SF, bodily pain (BP), and GH dimensions, respectively.

### Health-related quality of life measurements

The SF-36 was originally developed by Ware and Sherbourne,<sup>[10]</sup> and in Nigeria, it has been validated among the Yoruba population in Ile-Ife, Osun State.<sup>[11]</sup> The SF-36 v2 measures HRQL in eight dimensions.<sup>[12,13]</sup> (1) PF (limitations in physical activities because of one or more health problems); (2) RP (limitations in usual role activities because of physical health problems); (3) RE (limitations in usual role activities because of mental/emotional health problems); (4) SF (limitations in social activities because of physical or emotional problems); (5) BP; (6) VT (energy/fatigue); (7) MH (psychological distress and psychological well-being); and (8) GH perceptions.

Also included is a single item that provides an indication of perceived change in health; i.e., self-evaluated transition (SET) in health. Modifications made to the SF-36 v2 for use in this study included re-wording some sections and replacing some of the activities with those which fit into the socio-cultural context of Nigeria, which the respondents easily identified with.

### Health related quality of life scoring

The modified SF-36 v2 was scored following instructions described by authors,<sup>[14,15]</sup> with computed scores for each of the eight dimensions taking values between 0 and 100. For this study, the scores for each dimension were divided into four quartiles: 0–24 (quartile 1); 25–49 (quartile 2); 50–74 (quartile 3); and 75–100 (quartile 4). Quartiles 1 and 2 were merged and interpreted as poor HRQL for each dimension. Similarly, quartiles 3 and 4 were merged and interpreted as good HRQL for each dimension. Scores for each dimension were also summarized using median and interquartile range (IQR).

### Ethical considerations

The study was approved by the Health Research Ethical Committee of the FMC, Makurdi. Written informed consent was obtained from every PLWHA who agreed to participate in this study. The project site coordinator gave explicit permission to conduct the study in the hospital.

### Data collection

Data were collected between May and July 2017. The questionnaires were interviewer-administered by the principal investigator and three-trained research assistants who were Medical Officers. Only respondents who gave informed written consent were interviewed. Interviews were conducted in private within the ART clinic as respondents waited to be called for their drug pick-ups.

### Data analysis

Data were analyzed with Statistical Package for Social Sciences (SPSS) software version 17 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were generated for each study variable including frequencies and percentages for categorical variables, mean and standard deviation for symmetrical continuous variables, and median and IQR for skewed continuous variables. Chi-square was used to test associations between each HRQL dimension, and sociodemographic and clinical characteristics. Multivariate logistic regression analyses were performed to identify independent risk factors that predicted good HRQL for the various dimensions. Each HRQL dimension was used as the dependent variable in a separate logistic regression model including the patients' sociodemographic and clinical characteristics as independent variables. Level of statistical significance was set at 5%.

## RESULTS

### Sociodemographic and clinical characteristics

The socio-demographic and clinical predictors of good HRQL among respondents are shown in Table 1. A total of 546 respondents took part in this study of which 213 (39%)

**Table 1: Sociodemographic and clinical predictors of health-related quality of life (n=546)**

Sociodemographic characteristics	Frequency (%)
Age (years)	
20–29	115 (21.1)
30–39	217 (39.7)
40–49	137 (25.1)
≥50	77 (14.1)
Gender	
Male	213 (39.0)
Female	333 (61.0)
Marital status	
Single (never married)	73 (13.4)
Married	305 (55.9)
Others	168 (30.7)
Level of education	
No formal	49 (9.0)
Primary	112 (20.5)
Secondary	222 (40.7)
Postsecondary	163 (29.9)
Experience stigma	
Yes	72 (13.2)
No	474 (86.8)
Have caregiver	
Yes	349 (63.9)
No	197 (36.1)
Consume alcohol	
Yes	84 (15.4)
No	462 (84.6)
Enjoy social support	
Yes	311 (57.0)
No	235 (43.0)
Disclosed HIV-positive status	
Yes	506 (92.7)
No	40 (7.3)

were males and 333 (61%) were females. The mean  $\pm$  SD age was  $38.1 \pm 10.6$  years, with 332 (60.8%) aged <40 years and 214 (39.2%) aged  $\geq 40$  years; 308 (56.4%) were co-habiting with spouse/partner; 498 (91.2%) lived with nuclear/extended family; 439 (80.4%) had child(ren); 334 (61.2%) had a less than postsecondary education; while 462 (84.6%) were employed.

Seventy-two (13.2%) experienced stigma; 349 (63.9%) had a caregiver; 84 (15.4%) consumed alcohol; 311 (57%) enjoyed social support; and 506 (92.7%) had disclosed their HIV-positive status to others. Two hundred and ninety-two (53.5%) had been attending the clinic <4 years; 217 (39.7%) had been on ART <3 years; 71 (1.3%) experienced side effects of ARVs; 481 (88%) were satisfied with general medical care; and 447 (82%) experienced an improved change in health.

### Health-related quality of life scores and ratings for good health-related quality of life

Table 2 shows the scores for each of the HRQL dimensions. High scores were obtained on all the eight dimensions.

**Table 2: Respondents' scoring and ratings of health-related quality of life dimensions**

Respondents' scoring of HRQL dimensions (n=546)		
HRQL dimensions	Scores	
	Median	IQR
PF	100	95–100
RP	100	100–100
RE	100	91.7–100
VT	87.5	75–87.5
MH	85	70–90
SF	100	100–100
BP	90	80–100
GH	75	75–87.5

Respondents' ratings of HRQL dimensions (n=546)		
HRQL dimensions	Rating (frequency/%)	
	Poor HRQL	Good HRQL
PF	6 (1.1)	540 (98.9)
RP	19 (3.5)	527 (96.5)
RE	7 (1.3)	539 (98.7)
VT	17 (3.1)	529 (96.9)
MH	20 (3.7)	526 (96.3)
SF	10 (1.8)	536 (98.2)
BP	32 (5.9)	514 (94.1)
GH	36 (6.6)	510 (93.4)

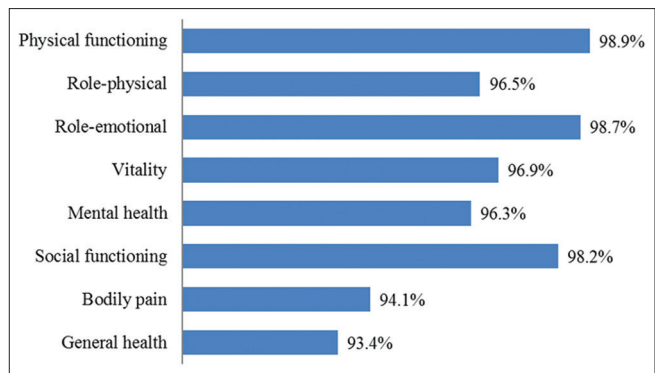
PF: Physical functioning, RP: Role-physical, RE: Role-emotional, VT: Vitality, MH: Mental health, SF: Social functioning, BP: Bodily pain, GH: General health, HRQL: Health-related quality of life, IQR: Interquartile range

Nevertheless, maximum scores were obtained for RP and SF; whereas the least score was obtained for GH. Furthermore, median (IQR) scores for each of the dimensions were: 100 (100–100) (role physical); 100 (100–100) (SF); 100 (95–100) (PF); 100 (91.7–100) (role emotional); 90 (80–100) (BP); 87.5 (75–87.5) (VT); 85 (70–90) (MH); and 75 (75–87.5) (GH).

Figure 1 shows ratings for good HRQL for each of the dimensions. Majority of respondents reported good HRQL on all the eight dimensions. Nevertheless, the three highest ratings of good HRQL were reported for PF (98.9%), RE (98.7%), and SF (98.2%), respectively; whereas the least good HRQL was reported for GH (93.4%).

**Associations between selected socio-demographic variables and some health-related quality of life measures**

Table 3 shows association between RP (with the highest median IQR score), GH (with lowest median IQR score) and respondents' sociodemographic characteristics. Good HRQL with RP was expressed by over 90% of the respondents on all socio-demographic characteristics measured. Furthermore, a significantly higher proportion of 326 (98.2%) persons aged <40 years compared with 201 (93.9%) aged ≥40 years ( $\chi^2 = 7.06, P = 0.008$ ); and 233 (99.1%) respondents who did not enjoy social support compared with 294 (94.5%) who did ( $\chi^2 = 8.49, P = 0.004$ ), demonstrated a good HRQL with RP,



**Figure 1: Percentages of respondents reporting good health-related quality of life for eight dimensions**

respectively.

Table 3 also shows association between sociodemographic characteristics and GH. Co-habiting with partner/spouse, 293 (95.1%) compared with being single/separated/divorced/widowed, 214 (89.9%) ( $\chi^2 = 5.50, P = 0.019$ ); having a caregiver, 330 (94.6%) compared with not having a caregiver, 177 (89.8%) ( $\chi^2 = 4.21, P = 0.040$ ); were significantly associated with good general HRQL, respectively. Age <40 years (odds ratio [OR] = 4.26, confidence interval [CI] = 1.49–12.11,  $P = 0.007$ ) and being employed (OR = 3.20, CI = 1.08–9.49,  $P = 0.036$ ) were significantly associated with good HRQL for RP. Conversely, enjoying social support (OR = 0.12, CI = 0.03–0.55,  $P = 0.006$ ) was significantly associated with the less likelihood of good HRQL for RP [Table 3]. Only general satisfaction with care received (OR = 6.05, CI = 2.78–13.17,  $P < 0.001$ ) predicted good general HRQL. Conversely, being single/separated/divorced/widowed (OR = 0.43, CI = 0.21–0.91,  $P = 0.027$ ) predicted the less likelihood of good general HRQL [Table 3].

**DISCUSSION**

**Scores and ratings of health-related quality of life dimensions**

This study has demonstrated that ART leads to a significant improvement in HRQL for HIV-positive adults. High ratings of good HRQL were obtained across all the eight dimensions measured. Nevertheless, respondents' ratings of good HRQL were highest with PF, RE, and SF dimensions, in that order. The highest rating of PF indicated that the vast majority of respondents had experienced little or no limitations with performing moderate-to-vigorous physical activities including lifting or carrying shopping items, climbing stairs, bending/kneeling/stooping, walking moderate distances, and caring for one's self (bathing and dressing).<sup>[12]</sup> This further suggests that the majority of the patients had experienced a significant improvement in their health because of ART and they were particularly more able to perform physical functions that they were hitherto unable to perform.

In Ile-Ife, Nigeria, however, the highest mean scores were obtained with MH, GH, VT, and PF dimensions, in that



**Table 3: Association between selected sociodemographic characteristics and role-physical, general health, and physical functioning (n=546)**

Variables	Bi-variate analysis				Logistic regression		
	Poor HRQL, n (%)	Good HRQL, n (%)	Test statistic	P	OR	95% CI	P
<b>Role physical</b>							
Age (years)							
<40	6 (1.8)	326 (98.2)	$\chi^2=7.06$	0.008	4.26	1.49–12.11	0.007
≥40	13 (6.1)	201 (93.9)			Reference		
Gender							
Male	9 (4.2)	204 (95.8)	$\chi^2=0.58$	0.447	1.43	0.56–3.56	0.228
Female	10 (3.0)	323 (97.0)			Reference		
Marital status							
No partner/spouse	10 (4.2)	228 (95.8)	$\chi^2=0.65$	0.419	1.45	0.58–3.64	0.214
Co-habiting	9 (2.9)	299 (97.1)			Reference		
Enjoy social support							
Yes	17 (5.5)	294 (94.5)	$\chi^2=8.49$	0.004	0.12	0.03–0.55	0.006
No	2 (0.9)	233 (99.1)			Reference		
<b>General health</b>							
Age (years)							
<40	18 (5.4)	314 (94.6)	$\chi^2=3.78$	0.052	2.06	0.99–4.27	0.054
≥40	21 (9.8)	193 (90.2)			Reference		
Sex							
Male	16 (7.5)	197 (92.5)	$\chi^2=0.07$	0.789	1.09	0.56–2.12	0.392
Female	23 (6.9)	310 (93.1)					
Marital status							
No partner/spouse*	24 (10.1)	214 (89.9)	$\chi^2=5.50$	0.019	0.43	0.21–0.91	0.027
Co-habiting	15 (4.9)	293 (95.1)			Reference		
<b>Physical functioning</b>							
Age (years)							
<40	4 (1.2)	328 (98.8)	Yates' c=0.00	1.000	2.06	0.99–4.27	0.054
≥40	2 (0.9)	212 (99.1)			Reference		
Gender							
Male	2 (0.9)	211 (99.1)	Yates' c=0.00	1.000	0.43	0.21–0.91	0.027
Female	4 (1.2)	329 (98.8)			Reference		
Marital status							
No partner/spouse*	4 (1.7)	234 (98.3)	Yates' c=0.54	0.464	1.43	0.69–2.96	0.337
Co-habiting	2 (0.6)	306 (99.4)			Reference		

Role physical: Hosmer–Lemeshow goodness of fit test:  $\chi^2=4.855$ ,  $df=8$ ,  $P=0.773$ . General health: Hosmer–Lemeshow goodness of fit test:  $\chi^2=4.865$ ,  $df=8$ ,  $P=0.772$ . Yates c=Yates' continuity correction. Cohabiting=Co-habiting with partner/spous. OR: Odds ratio, CI: Confidence interval, HRQL: Health-related quality of life

order.<sup>[11]</sup> The disparity between this Ife study and the present study may be due to sociocultural differences. While the Ife study was conducted in South West Nigeria, the present study was conducted in North Central Nigeria. Nonetheless, findings similar to the present study were obtained in Ilorin, Nigeria,<sup>[16]</sup> and other countries,<sup>[17-19]</sup> where the highest mean score was observed with PF compared to the other HRQL dimensions measured.

In the present study, the second and third highest reported HRQL were regarding RE and SF dimensions. This indicated that majority of the respondents were able to accomplish their work and other usual/social activities with the same care and within the normal time; and within the normal levels in terms of quantity and quality with which they usually perform them, without experiencing limitations due to emotional

problems.<sup>[12]</sup> In contrast, respondents had rated SF at the second position,<sup>[20,21]</sup> whereas RE scores were the fourth highest at baseline, but later increased to attain the third position after 12-month of HAART,<sup>[19]</sup> and this further demonstrates the importance of focusing treatment goals on optimizing HRQL rather than on improving survival only.<sup>[22]</sup>

In the present study, majority of the respondents also reported high rates regarding VT, RP, MH and BP dimensions. This indicated that in most respondents: Energy levels were high; and feelings of peace, happiness, and calm were experienced all or most of the time; while there was minimal/no pain.<sup>[12]</sup> In another study, high scores were also obtained on the energy, MH, and pain dimensions.<sup>[20]</sup> In contrast, of the dimensions assessed in another study, HRQL had increased significantly after 12 months of HAART on all the dimensions except for

VT and MH.<sup>[23]</sup> In that study, the least scores were obtained on the VT dimension and after 12 months of HAART, VT scores appreciated marginally but still remained the least. Whereas in another study,<sup>[19]</sup> role functioning scores were the second highest at baseline, but later dropped to the fourth position at 12-months of HAART. Patients' depressive symptoms at baseline were reported to be significantly predictive of this negative change in role functioning.

The least rating in the present study was obtained with GH dimension (93.4%). This implied that the remaining (6.6%) respondents were expecting that their GH might probably get worse.<sup>[12]</sup> Nonetheless, about three-quarters of respondents had perceived an appreciable improvement with regard to SET in health and this was believed to be due to the efficacy of HAART.

## CONCLUSIONS

This study adds to the body of knowledge that HAART improves the health outcomes of HIV patients in terms of HRQL. Given the changing epidemiology of HIV, and the associated stigma, discrimination, poor social support and challenges facing disclosure, clinicians should endeavor to assess these quality of life indices as they manage their clients, most especially in a chronic debilitating illnesses like HIV when patients have to cope with long period of ARVs which are not without side effects. Clinicians also need to be responsive to factors related to disclosure, having a care giver and social support as a means of improving HRQL.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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## ملخص المقال باللغة العربية

جودة الحياة المتعلقة بالصحة للمرضى الذين تحت العلاج بمضادات الفيروسات بالمركز الطبي الفيدرالي، ماكوردي،  
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السياق: يمكن أن توفر مؤشرات جودة الحياة الجنوبية الغربية معلومات حول آثار تطور المرض وفعالية التدخلات الطبية التي لا يمكن الحصول عليها باستخدام تدابير سريرية موضوعية.

الهدف: الهدف من هذه الدراسة هو تقييم جودة الحياة للمرضى تحت العلاج بمضادات الفيروسات شديدة الفعالية في المركز الطبي الفيدرالي، ماكوردي في شمال وسط نيجيريا.

الإعدادات والتصميم: كانت الدراسة عبارة عن مسح مقطعي بين الأشخاص المصابين بفيروس نقص المناعة البشرية / الإيدز على جودة الحياة.

الطريقة: تم اختيار 546 من المصابين بفيروس نقص المناعة المكتسبة باستخدام تقنية أخذ العينات المنهجية. تم استخدام الاستبيان الصحي النسخة الثانية المعدلة، لتقييم جودة الحياة للمجيبين في ثمانية أبعاد: (الأداء البدني)، (الدور البدني)، (الدور العاطفي)، (الأداء الاجتماعي)، (الألم الجسدي)، (الحيوية)، (الصحة العقلية)، (الصحة العامة). تم تحليل البيانات التي تم إنشاؤها بعد قياس وتسجيل جودة الحياة باستخدام الطرق القياسية باستخدام SPSS 17.

النتائج: تضمنت تقييمات جودة الحياة الجيدة لجميع المرضى النسب التالية: الأداء البدني 98.8%، الدور العاطفي 98.7%، الأداء الاجتماعي 98.2%، الحيوية 96.9%، الدور البدني 96.5%، الصحة العقلية 96.3%، الألم الجسدي 94.1%، والصحة العامة 93.4%. كانت تنبؤات جودة الحياة الجيدة على النحو التالي: العمر أقل من 40 عاماً وجود عمل للمريض وكذلك وجود داعم مقدم للرعاية. أما تنبؤات جودة الحياة الأقل جودة فشملت عدم وجود زوج أو شريك وعدم وجود الدعم الاجتماعي.

الاستنتاجات: خلص البحث إلى أن العلاج المضاد للفيروسات شديد الفعالية يحسن من جودة الحياة لمرضى فيروس نقص المناعة البشرية. يحتاج الأطباء إلى أن يكونوا مستجيبين للعوامل المتعلقة بالإفصاح والحصول على الرعاية والدعم الاجتماعي كوسيلة لتحسين جودة الحياة.

الكلمات المفتاحية: نوعية الحياة المتعلقة بالصحة، العلاج المضاد للفيروسات شديدة الفعالية، فيروس نقص المناعة البشرية، ماكوردي.