

Research Article

Health-Related Quality of Life and Associated Factors among Women on Antiretroviral Therapy in Health Facilities of Jimma Town, Southwest Ethiopia

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Received 17 October 2017; Revised 17 July 2018; Accepted 12 August 2018; Published 16 September 2018

Academic Editor: Jennifer L. Freeman

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Background. This study examined health-related quality of life and associated factors among HIV positive women receiving antiretroviral therapy in health facilities of Jimma town. **Methods.** A cross-sectional study was conducted, and consecutive sampling technique was employed to select 377 HIV positive women who were on antiretroviral therapy. Quality of life was measured using WHOQOL-BREF tool. Descriptive statistics, bivariate, and multivariable logistic regression analyses were performed. P values < 0.05 and adjusted odds ratio with 95% of confidence interval were used to determine statistical significance and report associations between the quality of life and independent variables. **Results.** Among the sampled participants, 344 were interviewed, yielding 91% of response rate. The mean \pm standard deviation age of the respondents was 34.07 ± 8.76 years and 80.5% of them were urban dwellers. The proportion of women reporting good health-related quality of life was found to be 46.5%. Specific to each domain, the mean \pm standard deviation of level of independence domain was the highest (14.08 ± 3.07) followed by physical (13.46 ± 2.95), social relationships (13.27 ± 3.91), psychological (12.97 ± 2.47), environmental (12.94 ± 3.25), and spiritual (12.39 ± 2.84) domains. Good social support (AOR: 4.99; 95% CI: [2.88, 8.34]), higher wealth status (AOR: 1.85; 95% CI: [1.02, 3.39]), and being on antiretroviral therapy for shorter duration (AOR: 1.85; 95% CI [1.14, 3.03]) were independently associated with better overall health-related quality of life among the participants. **Conclusions.** The study demonstrated high proportion of HIV positive women on ART had poor health-related quality of life which was affected by wealth index, social support, and duration on antiretroviral therapy.

1. Introduction

Over the past few decades, human immunodeficiency virus (HIV) has infected and killed millions of people globally, Sub-Saharan Africa (SSA) being most affected by the disease [1, 2]. Women, both globally and in least developed countries, bear higher burden of HIV infection than men due to various biological, social, and economic reasons. In Sub-Saharan region, gender aspect of the infection is more remarkable that women share the largest percent of the infected population. For instance, among young women aged 15–24, there are about 380,000 new HIV infections every year; and 15% of women living with HIV are aged 15–24, of whom 80% live in SSA [3, 4].

Ethiopia is one of the most affected SSA countries by HIV. In 2016, there were an estimated 718,500 people living with HIV in the country [5]. Like other SSA countries, women in Ethiopia are also disproportionately affected than men [3, 4]. In 2016, about two-thirds of the people living with HIV/AIDS (PLWHA) and newly infected individuals were women in this nation [5]. In addition, the social stigma and discrimination is higher against women than men [3].

In response to HIV pandemic, various interventions have been executed targeting improving diagnosis methods, treatment regimens, and strengthening HIV prevention and control programs [3, 6–8]. One of the interventions is the provision of antiretroviral therapy (ART) to the people who live with the infection [9, 10]. The treatment has resulted in

decreased incidence of the disease and increased longevity of the people living with the infection [11, 12]. Antiretroviral therapy also improves health-related quality of life (HRQoL) of individuals receiving the treatment [13, 14]. However, the psychological and economic burden of the infection associated with its chronicity made the long-term HRQoL benefits of the treatment dubious [12, 15].

Health-related quality of life is a multidimensional and complex concept [16] and reflects subjective perceptions of individuals, their physical health, psychological state, level of independence, social relationships, personal beliefs, and relationship to salient features of their environment [17, 18]. Health-related quality of life is associated with physical, psychological, and social aspects which are obviously influenced by individuals' beliefs, expectations, and perceptions [19, 20].

There are evidence that HRQoL of PLWHA has significant role in ART retention, treatment adherence, and survival [21–24]. As a result, the issue is becoming increasingly important for policy makers, program implementers, and researchers. Studies across various areas indicate that HRQoL of PLWHA is affected by socioeconomic variables, presence of comorbidities, stage of the disease, psychological factors, perceived stigma, behavioral factors, and availability of social support [25–40]. Poor adherence to ART is also another factor for compromised HRQoL among PLWHA. The studies also indicate women with HIV/AIDS are of poorer QoL than their men counterparts though they are generally more adherent to ART and similar disease stages [19, 25, 41].

Though there is established evidence on gender character of HIV/AIDS related HRQoL, in Ethiopia there is dearth of studies on HRQoL of women on ART. Particularly in our study area there is no evidence examining perceived HRQoL among women receiving ART. Therefore, this study aimed to examine the status of HRQoL and associated factors of HRQoL among women attending ART clinics at health facilities in Jimma town, southwest Ethiopia.

2. Methods and Materials

2.1. Study Settings and Design. An institution based cross-sectional study was conducted among women on ART from health facilities in Jimma town from May to June 2016. Jimma town is located 346 kilometers southwest of Addis Ababa, the capital of Ethiopia. The town has two public hospitals (Jimma University Specialized Hospital (JUSH) and *Shenen-Gibe* Primary Hospital) and one health center (Jimma Town Health Center) which provide ART services.

2.2. Sampling and Data Collection Tool. During the study period, a total of 3,172 HIV positive women (2,437 at JUSH, 612 at Jimma Health Center, and 123 at *Shenen-Gibe* Primary Hospital) were receiving ART. A sample size of 377 women on ART was calculated by taking $p = 50\%$ (expected proportion of women on ART with good HRQoL), 5% margin of error, 95% confidence level, adjusting to finite population, and adding 10% expected nonresponse rate. The sample was proportionately allocated among the three health facilities based on their population size as 289, 73, and 15 to JUSH, Jimma Town Health Center, and *Shenen-Gibe* Primary Hospitals,

respectively. Finally, the required sample of study participants was selected consecutively till the required sample size was fulfilled. Women who were critically ill, less than 18 years of age, and pregnant during the data collection period are excluded.

The data were collected using pretested, structured questionnaire which comprises World Health Organization (WHO) Quality of Life HIV short form instrument (WHOQOL-HIV BREF) items, sociodemographics, wealth index, clinical, social support variables, and perceived stigma assessing questions.

WHOQOL-HIV BREF contains 31 items distributed into 6 domains: physical, social relationships, level of independence, and spirituality domains each with 4 items and psychological and environmental domains with 5 and 8 items, respectively. The individual items are rated on a 5-point Likert scale where 1 indicates low/negative perceptions and 5 indicates high/positive perceptions. The remaining two items measure overall perceived quality of life and general health perception of women living with HIV [20]. The items were contextualized to the study area and translated to the local language (*Amharic* and *Affan Oromo*).

Wealth index was assessed using a tool adopted from Ethiopian Demographic and Health Survey (EDHS) wealth index assessment questionnaire. Clinical variables were collected from patients' medical records. Social support variable was measured using a 19-item Medical Outcomes Study Social Support Survey (MOS-SSS) designed to measure participants' perception of the availability of functional support along 4 dimensions: emotional, affectionate, tangible, and positive social interaction dimensions. The items were rated on a five-point response format of availability ranging from "none of the time" (1) to "all of the time" (5). A total score was obtained by summing responses to all items (ranging 19–95), with higher scores reflecting greater available support. In addition, individuals scoring above the mean social support score were categorized as of "good social support", and those with below the mean were classified as "poor social support" [42].

Perceived stigma was measured by 23 questions adopted from Berger et al. that have been contextualized locally. The questions consist of four-point Likert scale (strongly disagree to strongly agree) questions focusing on perceived isolation, shame, guilt, and disclosure of the HIV status. The scores of perceived stigma range from 23 to 92. A person was said to perceive stigma if he/she scored above the mean, otherwise no perceived stigma [43].

2.3. Data Collection and Analysis. The questionnaires were administered through face-to-face interview by trained counseling nurses who were not affiliated to the health facilities in which the data were collected. Supervisors were also trained and deployed for checking each questionnaire for its completeness and cleaning at the end of each data collection day and overall data quality management. Furthermore, the data collection tool was tested prior to the actual data collection on 19 women on ART attending Agaro Hospital ART Clinic which is in a neighboring town of the study area.

Responses were coded, entered, and analyzed using Statistical Package for the Social Sciences (SPSS) version 21. The statistical analyses comprised three steps. First descriptive statistics (mean, standard deviation, median, range, frequency, and proportions) were computed to describe the participants' demographics and other characteristics. All domain scores in WHOQOL-HIVBREF were scaled in positive direction with higher score denoting good quality of life. Within each domain, the mean scores of the items were calculated and dichotomized into poor versus good. Then, bivariate analysis was carried out whereby those variables which had p -values < 0.25 in each of the six WHOQOL domains and overall HRQoL were considered candidates for multivariable logistic regression model. Finally, multivariate logistic regression model was fit, and the overall statistical significance of the model was reported using adjusted odds ratios (AOR) with its corresponding 95% confidence intervals. P value < 0.05 was considered statistically significant.

Ethical clearance was secured from Institutional Review Board of College of Health Sciences of Jimma University (Ref No. RPGC/I67/2016). Verbal consent was obtained from the study participants before conducting the interview. The right of respondents not to participate in the interview or to withdraw at any time was also assured.

3. Results

3.1. Sociodemographic, Clinical, and Psychosocial Characteristics of Study Participants. Among the sampled 377 study participants, 344 were interviewed, yielding response rate of 91%. Majority of the study participants were from JUSH and urban residents, accounting for 76.8% and 80.2%, respectively. The mean \pm standard deviation (SD) age of the respondents was 34.07 ± 8.76 years, nearly half of them being between ages of 29-39 years. Most (54.7%) of the participants were married and 60.5% of them completed elementary school education. About 47% of the respondents were self-employed. Forty percent (40%) of the respondents were Muslims and 44% Oromo by ethnicity (Table 1). The wealth index of the respondents showed that about one-third of the participants were in the second tertile.

The median time (in months) since the women had known their HIV status was 66 with range of 7-158. Regarding the functional status of the respondents, almost all of them were under working functional status category during the start of ART. About 62% of the respondents had CD4+ cells counts > 200 cells/mm³ when they started receiving the treatment. However, this figure was observed to rise to 93% during the study periods. Almost all respondents were placed under the first-line ART drug regimen at the start of the treatment as well as during the time of data collection. At the beginning of the therapy, 45.3% of the participants were of WHO clinical stage 2 and during the study period, the proportion of this category was 91.3%. During the study period, more than 95% of the participants were not diagnosed with opportunistic infections. On average, the women were on ART for 57 months (Table 1).

The 19-item Likert scale social support tool was tested for reliability and it showed excellent internal consistency

with Cronbach's $\alpha=0.960$. Taking the mean as a cut-off point, majority of the respondents (61.3%) were categorized to have poor social support. It was also revealed that around half of the respondents perceived that they had been stigmatized (Table 1).

3.2. Health-Related Quality of Life of Women on Antiretroviral Therapy. As mentioned above, HRQoL of the participants was assessed using WHOQOLHIV-BREF tool. The tool's reliability was high (Cronbach's $\alpha=0.898$). Internal consistency measures of each domain of the tool and other findings were presented in Table 2. Level of independence domain of HRQoL was the highest with mean \pm SD of 14.08 ± 3.069 . The mean score of overall HRQoL, composited from all the six domains, was 13.21 ± 2.19 . The mean scores for each domain and the overall HRQoL were used as cut-off point to categorize the participants domains of HRQoL and overall HRQoL as poor (less than or equal to the mean score) or good (greater than the mean score). Accordingly, in all the domains, the participants' quality of life was found to be poor and 53.5% of the respondents had poor overall HRQoL (Table 2).

In addition to the six domains of HRQoL, the tool also measures general perceived quality of life (QoL) and health status. About 33% of the participants reported their general QoL as indifferent, whereas 23.6% said that it was poor or very poor. The remaining (43.3%) reported to be good or very good. Regarding satisfaction about their health, 50 (14.5%) of the respondents replied that they were dissatisfied or very dissatisfied, 137 (39.8%) neither satisfied nor dissatisfied, and 157 (45.6%) were satisfied or very satisfied.

3.3. Factors Affecting Overall Health-Related Quality of Life. In the multivariate analysis, higher wealth index, shorter duration since ART initiation, and good social support were found to have statistically significant associations with good overall HRQoL among the study participants. The third tertile (highest wealth index) was 1.85 times more likely to have good overall HRQoL than those who are in the second tertile of wealth index (AOR: 1.85; 95% CI: [1.02, 3.39]). But there was no statistically significant difference in overall HRQoL between women of the second and first wealth tertile. On the other hand, those who had been on ART for less than 57 months (5.5 years) were almost twice more likely to have better overall HRQoL (AOR: 1.85; 95% CI: [1.14, 3.03]) than those who had been more than 57 months on treatment. It was also shown that participants who reported to have good social support were about 5 times more likely to have good overall HRQoL in comparison with those who reported to have poor social support (AOR: 4.89; 95% CI: [2.88, 8.34]) (Table 3).

3.4. Factors Affecting Domains of Health-Related Quality of Life

3.4.1. Level of Independence Domain of Quality of Life. The multivariate analysis shows that only social support significantly associates with domain of level of independence. Those women who reported to have good social support were about

TABLE 1: Sociodemographic, clinical, and psychosocial characteristics of the study participant in, 2016 (n=344).

<i>Descriptions</i>		<i>Frequency (%)</i>
<i>Sociodemographic variables</i>		
Place of residence	Rural	68 (19.8)
	Urban	276 (80.2)
Age (years)	18-28	96 (28.0)
	29-39	165 (47.9)
	≥40	83 (24.1)
Marital Status	Single	71 (20.6)
	Married	188 (54.7)
	Others	85 (24.7)
Educational status	No education	41 (11.9)
	Elementary school	208 (60.5)
	Secondary school and above	95 (27.6)
Occupation	Employed	97 (28.2)
	Self-employee	161 (46.8)
	No job	86 (25.0)
Religion	Muslim	139 (40.4)
	Orthodox	131 (38.1)
	Others	74 (21.5)
Ethnicity	Oromo	151 (43.9)
	Dawro	55 (16.0)
	Amhara	84 (24.4)
	Others	54 (15.7)
Wealth index	1 st tertile	114 (33.1)
	2 nd tertile	117 (34.0)
	3 rd tertile	111 (32.3)
<i>Clinical Characteristics</i>		
Time since they had known their HIV status	<66 months	173 (50.3)
	≥66 months	171 (49.7)
Functional status during start of ART	Working	259 (75.3)
	Ambulatory	70 (20.3)
	Bedridden	15 (4.3)
Current functional Status	Working	330 (95.9)
	Ambulatory	14 (4.1)
Opportunistic infection	No	327(95.0)
	Yes	17 (5.0)
CD4 count at start of ART	Below 200 cells/mm ³	129 (37.5)
	200 cells/mm ³ and above	215 (62.5)
Current CD4 count	Below 200 cells/mm ³	25 (7.3)
	200 cells/mm ³ and above	316 (92.7)
WHO clinical stage at start of ART	Stage 1	59 (17.2)
	Stage 2	156 (45.3)
	Stage 3	105 (30.5)
	Stage 4	24 (7.0)
Current WHO clinical stage	Stage 1	17 (4.9)
	Stage 2	314 (91.3)
	Stage 3	10 (2.9)
	Stage 4 or T1	3 (0.9)
ART regimen at start	1 st line regimens	342 (99.4)
	2 nd line regimens	2 (0.6)
Recent ART regimen	1 st line regimens	341 (99.1)
	2 nd line regimens	3 (0.9)

TABLE 1: Continued.

<i>Descriptions</i>		<i>Frequency (%)</i>
Duration on ART (in months)	<57	186 (54.1)
	≥ 57	158 (45.9)
<i>Psychosocial Characteristic</i>		
Social support	Poor social support	211 (61.3)
	Good social support	133 (38.7)
Perceived stigma	Low perceived stigma	171 (49.7)
	High perceived stigma	173 (50.3)

TABLE 2: HRQoL domains' mean score of women on ART in Jimma town health facilities, 2016 (n = 344).

QoL Domains (No. of items)	Cronbach's α	Mean	Std. Deviation	Domains of quality of life	
				Poor N (%)	Good N (%)
Physical (4)	0.703	13.4622	2.95324	195(56.7)	149(43.3)
Psychological (5)	0.698	12.9675	2.46975	194(56.4)	150(43.6)
Level of independence (4)	0.77	14.0843	3.06896	195(56.7)	149(43.3)
Social relationships (4)	0.813	13.2703	3.90852	188(54.7)	156(45.3)
Environmental (8)	0.794	12.9390	3.32528	172(50)	172(50)
Spiritual (4)	0.892	12.3895	2.83964	195(56.7)	149(43.3)
Overall HRQOL	0.898	13.2112	2.19448	184(53.5)	160(46.5)

TABLE 3: Factors associated with overall HRQoL among women on ART in health facilities, Jimma town, Ethiopia, 2016 (n=344).

Variables	Overall HRQoL	
	Crude OR [95% CI]	Adjusted OR [95% CI]
Age of the women in years	18-28	1.72 [1.03, 2.85]
	29-39	1
	>39	1.92 [1.12, 3.28]
Educational status	No education	1.74 [0.89, 3.42]
	Primary school	1
	Secondary school & above	2.07 [1.26, 3.39]
Social support	Poor s. support	1
	Good s. support	4.99 [3.12, 7.99]
Wealth index tertile	1 st tertile	0.96 [0.57,1.66]
	2 nd tertile	1
	3 rd tertile	1.65 [0.97,2.76]
Duration on ART	<57 months	1 ¹
	≥57 months	0.67[0.44,1.03]

*Variable statistically significant at P< 0.05; AOR: adjusted odds ratio, COR: crude odds ratio; CI: confidence interval.

three times more likely to have better level of independence than those of poorer social support (AOR: 3.24; 95% CI: [1.98, 5.32]) (Table 4).

3.4.2. Physical Health Quality of Life Domain. Place of residence, educational status, and social support were found to have significant effects on physical health domain of QoL after controlling possible confounders. Women residing in urban area were 1.96 times more likely to have good physical

health QoL compared to their counterparts of rural resident (AOR: 1.96; 95% CI: [1.09, 3.57]). The study also revealed that women on ART who enrolled in secondary school or above were 1.98 times more likely to have good physical quality of life than those who were in the elementary school or had no education (AOR: 1.98; 95% CI: [1.17, 3.35]). It was also shown that those women who reported to have good social support were 1.78 times more likely to have good physical quality of life in comparison with those women who reported to have poor social support (AOR: 1.78; 95% CI: [1.10, 2.88]) (Table 4).

TABLE 4: Factors associated with domains of quality of life among women on ART in health facilities of Jimma Town, southwest Ethiopia, 2016 (n = 344).

Variables	Physical QoL		Psychological QoL		Level of Independence QoL		Social Relationship QoL		Environmental QoL		Spiritual QoL	
	COR [95% CI]	AOR [95% CI]	COR [95% CI]	AOR [95% CI]	COR [95% CI]	AOR [95% CI]	COR [95% CI]	AOR [95% CI]	COR [95% CI]	AOR [95% CI]	COR [95% CI]	AOR [95% CI]
Age (in years)												
18-28	1.59[0.96,2.65]	1.65[0.93, 2.95]			1.71[1.02, 2.84]	1.47[0.81, 2.68]						
29-39	1	1	1	1	1	1						
>39	1.47[0.86, 2.51]	0.97[0.53, 1.76]			1.62[0.95, 2.78]	1.08[0.58, 2.02]						
Place of residence												
Rural	1.36[0.79, 2.31]	0.51[0.28, 0.92]*										
Urban	1	1										
Educational status												
No education	1.58[0.81, 3.11]	1.30[0.63, 2.68]	1.07[0.54, 2.11]	0.96[0.45, 2.02]	1.41[0.72, 2.77]	1.25[0.56, 2.78]	1.46[0.75, 2.85]	1.26[0.58, 2.75]				
Primary school	1	1	1	1	1	1	1	1				
Secondary School & above	2.10[1.28, 3.44]	1.98[1.17, 3.35]*	1.67[1.03, 2.73]	1.25[0.72, 2.20]	1.98[1.22, 3.23]	1.27[0.70, 2.29]	1.54[0.95, 2.52]	1.14[0.64, 2.04]				
Social support												
Poor s. support	1	1	1	1	1	1	1	1	1	1	1	1
Good s. support	2.17[1.41, 2.94]	1.78[1.10, 2.88]*	3.38[2.15, 5.32]	3.38[2.05, 5.56]*	3.98[2.51, 6.29]	3.24[1.98, 5.32]*	4.0[2.5, 6.25]	4.76[2.7, 8.33]*	4.69[2.92, 7.53]	4.85[2.83, 8.31]*		
Time since HIV diagnosed												
< 66 months					1.35[0.81, 2.23]	1.69[0.90, 3.16]						0.65[0.39, 1.10]
≥ 66 months					1	1						1

TABLE 4: Continued.

Variables	Physical QoL		Psychological QoL		Level of Independence QoL		Social Relationship QoL		Environmental QoL		Spiritual QoL	
	COR [95% CI]	AOR [95% CI]	COR [95% CI]	AOR [95% CI]	COR [95% CI]	AOR [95% CI]	COR [95% CI]	AOR [95% CI]	COR [95% CI]	AOR [95% CI]	COR [95% CI]	AOR [95% CI]
WHO Clinical Stage at the beginning of ART												
Stage 1												
Stage 2												
Stage 3												
Stage 4												
Wealth index tertile												
1 st tertile												
2 nd tertile												
3 rd tertile												
Perceived stigma												
Low												
High												
Duration on ART												
<57 months												
≥57 months												
CD4 count during the beginning of ART												
<200 cells/mm ³												
≥200 cells/mm ³												

* Variable statistically significant at P < 0.05; AOR: adjusted odds ratio, COR: crude odds ratio; CI: confidence interval.

3.4.3. Social Relationship Quality of Life Domain. Four variables (wealth index, WHO clinical stage during start of ART, social support, and perceived stigma) had significant associations with social relationship QoL after adjusting for confounders. Those women who were in clinical stage 4 were about four times more likely to have good social relationship QoL (AOR: 3.92; 95% CI: [1.37, 11.27]) than those who were in clinical stage 2. Respondents who perceived low stigma were two times more likely to have good social relationship QoL than those who had high perceived stigma (AOR: 2.13; 95% CI: [1.29, 3.44]). Similarly, respondents under third wealth tertile category were about twice more likely to have good social relationship QoL than those in other wealth index categories (AOR: 1.96; 95% CI: [1.09, 3.52]). It was also revealed that those women who reported that they get good social support were about 5 times more likely to have good social relationship QoL in comparison with those who received poorer social support (AOR: 4.76; 95% CI: [2.7, 8.33]) (Table 4).

3.4.4. Psychological Quality of Life Domain. In this domain, wealth index and social support had a significant association with psychological QoL. In the wealth index respondents belonging to third tertile were 2.53 times more likely to have better psychological QoL than those who are in the middle or first wealth tertiles (AOR: 2.53; 95% CI: [1.423, 4.505]). On the other hand, women who reported to have good social support were 3.38 times more likely to have better level of psychological QoL in comparison with those who reported that they receive poorer social support (AOR: 3.38; 95% CI: [2.05, 5.56]) (Table 4).

3.4.5. Environmental Quality of Life Domain. Among the variables assessed, WHO clinical stage during start of ART, social support, duration since ART initiation, and wealth index were found to be independent predictors of environmental QoL. Those women in clinical stage 2 were about three times more likely to have good environmental QoL than those women in clinical stage 3 (AOR: 2.86; 95% CI: [1.02, 8.33]). Similarly, respondents categorized under the third tertile of wealth index were twice more likely to have good environmental QoL than those women under the second tertile (AOR: 2.199; 95% CI: 1.20, 4.03). Furthermore, respondents who reported to have good social support were about 5 times more likely to have good environmental QoL than those who have poor social support [AOR: 4.85; 95% CI: [2.83, 8.31]]. The study also revealed that women who had been on ART for less than 57 months were more likely to have better environmental QoL than those for 57 months or more (AOR: 1.75; 95% CI: [1.07, 2.86]) (Table 4).

3.4.6. Spiritual Quality of Life Domain. CD4 count at the beginning of ART and time since they had been diagnosed for HIV had association with their spiritual QoL. Those women whose CD4 count at the start of ART was less than 200 cells/mm³ were 52% less likely to have good spiritual QoL than those women whose CD4 count had been equal to or above 200 cells/mm³ (AOR: 0.48; 95% CI: [0.29, 0.79]). In similar fashion, women that were diagnosed with HIV 5.5

years (66 months) prior to the study period were slightly more likely to have a better spiritual QoL than those who were diagnosed within 5.5 years during the study period (AOR: 0.96; 95% CI: [.60, .99]) (Table 4).

4. Discussion

This study revealed that majority of the women under study were from urban areas (80.2%), between the ages of 29 and 38 years (47.9%), and married (54.7%) and 60.5% of them attended elementary school. These sociodemographic characteristics are in line with the Ethiopian Demographic and Health Survey figures that indicate the burden of HIV/AIDS in the country with respect to the demographic and social status of PLWHA. According to the survey, female in urban areas and under the age group 29-30 years are more affected by HIV than the rural women and other age groups in Ethiopia [44].

In this study, it was shown that the overall HRQoL and each domain of QoL of women on ART in Jimma town health facilities were poor. This finding is consistent with other studies produced elsewhere in which HRQoL of people with HIV were documented to be poor [27, 30, 34, 39, 45, 46]. However, other studies came up with results which discord the current findings in relation to level of overall HRQoL [29, 47–52], in which the other studies show better overall HRQoL than the current findings. This difference is attributed to the socioeconomic differences across the study participants as most of these studies came from economically advanced countries. In addition, unlike the current study, others include both sexes as study population.

Level of independence domain was of the highest mean score among the six domains of HRQoL followed by physical health, social relationships, psychological, environmental, and spiritual QoL. These findings are not in line with those from other studies [25, 27, 41, 45, 53, 54]. The discrepancy may be attributed to the differences in the study areas and periods, and sociodemographic changes across the study populations.

This study also examined factors affecting the overall HRQoL and its domains among the study participants. The overall HRQoL of the participants was affected by wealth index, duration since ART initiation, and social support. Individuals with higher wealth index had better HRQoL. This evidence is also supported by studies from Nigeria and India in which higher income was associated with good QoL on the physical health, psychological health, level of independence, and spirituality/ personal beliefs domains [25, 29, 55, 56].

However, other sociodemographic variables assessed in this study such as age, place of residence, educational, marital, and employment status were not found to have statistically significant relation with overall HRQoL. Nevertheless, other studies indicated that employment and educational status were determined to be a positive factor for better overall HRQoL among PLWHA [34, 57–59]. The disagreement may be attributed to the differences in the study populations.

Clinical characteristics assessed in this study (current WHO clinical stage, ART regimen that the respondents were placed to, current CD4 cells count levels, and current functional status of the participants) had no statistically

significant associations with neither overall HRQoL nor domains of QoL of PLWHA receiving ART in the study area. In contrast to this, several studies indicated that higher CD4 cell counts of PLWHA were associated with better HRQoL [21, 39, 60–64]. However, duration on ART was significantly associated with overall HRQoL of the participants, individuals with shorter duration on ART having better HRQoL. This might be due to the fact that HIV/ AIDS is one of the chronic illnesses affecting economic, psychological, and social aspects of patients. Improvement of QoL that resulted from the treatment may be outweighed by the negative impacts of chronicity of the disease. Furthermore, this finding is supported by a recent study carried out in Kenya in which it was reported that patients on ART for a relatively longer duration had had poorer HRQoL than those who had been on ART for lesser durations [46].

In this study, it was unveiled that better social support is a predictor for better HRQoL. This finding was concurrent with other studies across various countries [19, 25, 27, 29, 31, 32, 34, 36, 53, 65]. This is mainly because social support is crucial for adherence to ART drugs which in turn improves the patients' quality of lives [27, 29, 31, 32, 34, 36, 65] though adherence to the treatments and social support are not sufficient to ensure HRQoL.

Regarding the domains of HRQoL, among variables assessed, wealth index was found to be positively associated with psychological, social, and environmental domains of HRQoL but had no significant effect on physical, level of independence, and spiritual domains. This is supported by studies from other parts of the world in which women of better income had better physical HRQoL [32, 55]. Place of residence and educational status had significant associations with physical health domain. Women on ART who were more educated and residing in urban areas were more likely to have better physical health than women who were less educated and living in rural areas. These associations may be attributed to the fact that better educational status and living in urban areas offer a better job opportunity, access to health care, and information. This finding is similar with the existing evidence [28, 29, 31, 32, 41, 65]. However, these variables as well as the remaining sociodemographic factors (age, religion, ethnicity, and marital status) had no significant effects on other domains of HRQoL. This result discords with other findings [12, 22, 66] in which the younger the patients, the better the various domains of HRQoL.

In this study, social support was found to positively affect five of the six domains of HRQoL. The finding is in line with those from other developing countries which documented that better social support positively affects physical health domain [28, 29, 31, 32, 34, 46, 67]. It is remarkable that social support is most important factor for improved QoL among women living with HIV in the study area.

Level of perceived stigma was found to affect only social relationship domain of the HRQoL in the current study setting. This is supported by longitudinal study conducted in developing countries that perceived HIV stigma has a significant negative and constant impact upon HRQoL for people with HIV infection [68]. Other studies also show

that the social relationship domain has negative impacts on HRQoL among PLWHA [69, 70].

Clinical variables (clinical stage when ART had been initiated, CD4 cell count during the start of ART, time since diagnosis of HIV by the participants, and duration since start of ART) had also significant associations with domains of HRQoL. WHO clinical stage of the women at the start of ART had positive relationship with social relationship domain and negative with environmental health domain. Women who had been at stage 4 (WHO Clinical Stage at the beginning of ART) were more likely to have better quality of social relationship domain than those in stage 2. This finding is in contrast with the findings in other studies in which lower clinical stages were associated with better QoL [65, 70].

On the other hand, women who had been in stage 2 were of better environmental health domain than that of stage 3. Women with less CD4 cells count during the start of the treatment were found to have poorer spiritual QoL. As CD4+ cells count increases in the body, the capability of protection from opportunistic infection also increases, which in turn leads to better QoL. Other studies conducted in India also showed that patients with higher CD4 count had better QoL [63, 69]. In contrast, a recent cohort study from Uganda revealed that there is no association between change in CD4 count and quality of life scores [27, 30]. However, amount of CD4 count during ART initiation or during the study period did not affect other domains of QoL in this study.

Time elapsed since the women had been diagnosed for HIV was found to be positively associated with spiritual domain. Living with the infection for longer time may lead to better adaptability and QoL. But this variable was associated with neither the other domains nor the overall HRQoL in this study. The other clinical variable which affected HRQoL of the respondents in the current study area was duration on ART. The longer they were on ART, the poorer environmental domain of QoL they had.

5. Limitations

As this study is cross-sectional, it cannot establish causality of the associations between the outcome variables and independent variables. Although variables which were presumed to have associated with HRQoL among PLWHA, such as alcohol use, smoking, and chewing khat, have been assessed, they cannot be analyzed because their observed frequencies were too low as the sample size is small.

6. Conclusion and Recommendations

This study demonstrated that the status of HRQoL among HIV positive women who were on ART treatment in Jimma town health facilities was poor. Along with this finding, wealth index, social support, and duration on ART were identified to affect HRQoL of the study participants in the study setting. The study also examined the proportion and associated factors of the six domains of HRQoL. Majority of the participants were found to have poor QoL in all the domains. These domains of QoL were affected by social support, place of residence, educational status, wealth index,

duration since diagnosis, WHO clinical stage at start of ART, perceived stigma level, duration on ART, and CD4 count at start of the treatment.

We recommend branches of Ethiopian Ministry of Health and organizations concerned about welfare of PLWHA to enhance social support services delivered to women with HIV/AIDS to improve psychological, environmental, and overall HRQoL of the target group. In addition, strategies must be formulated and implemented to promote financial welfare of women with HIV/AIDS to enhance their quality of lives. We also recommend researchers to conduct further studies by applying stronger designs to establish causal relationship between health-related quality of lives of women on ART and factors identified to affect it, such as duration on ART treatment.

Abbreviations

AIDS:	Acquired Immuno-Deficiency Syndrome
AOR:	Adjusted odds ratio
ART:	Antiretroviral therapy
CI:	Confidence interval
COR:	Crude odds ratio
HIV:	Human Immunodeficiency Virus
HRQoL:	Health-related quality of life
PLWHA:	People living with HIV/AIDS
QoL:	Quality of life
SSA:	Sub-Saharan Africa
WHO:	World Health Organization.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

We would like to thank Jimma University College of Health Sciences, for providing us with the opportunity to carry out this study. We would also like to thank all the data collectors and study participants for their participation and willingness to be involved in the study.

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