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Original Article

FACTORS ASSOCIATED WITH QUALITY OF LIFE AMONG PEOPLE LIVING WITH HIV/AIDS ON HIGHLY ACTIVE ANTI RETROVIRAL THERAPY: A CROSS-SECTIONAL STUDY

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ABSTRACT

Objective: To assess Quality of life (QoL) and its associated factors in people living with HIV/AIDS (PLWHA) who taking highly active antiretroviral therapy (HAART) in Wangaya Hospital in Denpasar, Bali, Indonesia.

Methods: A cross-sectional study was conducted during February 2019 to January 2020 at Wangaya Hospital in Denpasar, Bali, Indonesia. QoL was assessed using the five-level version of the EuroQol five-dimensional questionnaire (EQ-5D-5L), EQ-5D index value, and the EuroQol visual analogue scale (EQ-VAS). The data was analyzed using Statistical Package for Social Science (SPSS) software package version 26.0. Bivariate analysis was tested using the cross-tabulation Gamma, Kruskal-Wallis and post hoc Mann-Whitney test. P value<0.05 was considered as statistically significant.

Results: A total of 584 PLWHA took HAART for at least 3 mo. The median index value and EQ-VAS were 1.0 (range-0.514–1.0) and 100.00 (range 30-100), respectively. Most patients had problems in 'anxiety/depression' and 'pain/discomfort' domains. Predictors of better QoL included men, married, good adherence, and treatment duration>24 mo ($p<0.05$). Predictor of poorer QoL included an advanced HIV clinical stage($p=0.001$).

Conclusion: The QoL scores of PLWHA receiving HAART in our study were high; hence the QoL of PLWHA was good. The good QoL can be taken as the goal for HIV treatment in order to have a successful HAART therapy.

Keywords: Quality of life, PLWHA, HAART, EQ-5D-5L

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INTRODUCTION

Human Immunodeficiency Virus (HIV)/*Acquired Immunodeficiency Syndrome* (AIDS) is still a major health issue worldwide [1]. People living with HIV/AIDS (PLWHA) often appears with many comorbidities and stigma from their community [2-4]. PLWHA must face the disease caused by HIV infection itself or iatrogenic due to the treatment [5]. Hence, HIV/AIDS gives an increasing health burden that causing several socioeconomic problems for the patient, family, community, and government [1-2]. In 2018, approximately 37.9 million people living with HIV infection and 62% of PLWHA in middle-low income countries have received HAART [1]. Based on HIV/AIDS data in Indonesia 2019, there are 349.882 HIV cases and 117.064 AIDS cases from 1987 to June 2019 [6]. Most of PLWHA are in the productive age, which is 25-49 y (71.1%) [6, 7]. Not all PLWHA in Indonesia has received HAART. Only 33% PLWHA received HAART routinely and the dropout rate is still high (23%) [6].

In the era of HAART, the mortality rate of PLWHA has decreased and made it a managable or controllable chronic disease [1, 8-10]. HAART is a long-life treatment; therefore, outcome monitoring is needed to assess the effectiveness and the quality of health care system. HAART aims are not only to increase survival but also to make PLWHA able to carry out daily life well. QoL is an important outcome indicator in assessing the impact and the quality of the health care system, making decision, and treatment evaluation [11-16]. QoL is defined as a subjective multidimensional evaluation of one's function and his well-being in everyday life [17-21]. WHO defines the quality of life as an 'individual' perception of their position in life, in the context of the culture and value system in which they live and their relation to their goals, standards, hopes, and concerns [22-24].

A study from China reported that age, educational state, marriage state, occupational state, CD4+cell count, HIV treatment state, WHO clinical stage had a significant association with QoL of PLWHA [25]. Several factors are known to be related to QoL of PLWHA. Sociodemographic characteristics such as male sex, younger age, higher socioeconomic status, and having a job are associated with a better life quality [26-30]. Lower HIV viral load, higher CD4+cell counts, fewer HIV symptoms, indicate better clinical/immunological indicators of life quality [27-36].

This study assesses QoL of PLWHA who were taking HAART and the factors related with QoL outcomes from HAART at Merpati Clinic, Wangaya Hospital in Denpasar, Bali, Indonesia.

MATERIALS AND METHODS

Study population and design

A hospital-based cross-sectional study was conducted among 584 adult PLWHA (aged ≥ 17 y) taking HAART for at least 3 mo at Merpati Clinic, Wangaya Hospital in Denpasar, Bali, Indonesia. All PLWHA who came for control routinely during February 2019 to January 2020 were the participants in this study.

The comprehensive care support treatment would be provided to all adult PLWHA during the control regularly every 30 d and who were given written informed consent. The participants were interviewed about the socio-demographic characteristics. The socio-demographic data included age, sex, education status, marital status, and employment status. The clinical characteristics included HIV transmission route, last CD4+cell count, HIV clinical stage, treatment compliance, duration of HIV infection, duration of HAART, and the adherence to HAART.

The adherence was measured by the pill counts taken based on a 30 d recall. The adherence index was calculated by the formula:

$$\frac{\text{Total number of drugs taken (for 30 days)}}{\text{Total number of drugs prescribed (for 30 days)}} \text{ x } 100$$

Participants with ≥ 95% of adherence were considered as having good adherence (Good adherence to HAART was defined as taking HAART for 30 d more than 95%) [37, 38].

Life quality assessment was done through interviews using an instrument issued by The EuroQoL Group called the EuroQoL–5 Dimensions–5 Levels (EQ-5D-5L) [37, 39]. This instrument consisted of five dimensions, including mobility, self-care, usual activities, pain/discomfort, anxiety/depression. This instrument has been widely used in various studies on health-related QoL (HRQOL) and has been made in various language versions, one of which is Indonesian. EQ-5D-5L provides a descriptive profile and assessment of a single index for current health status. Each dimension was divided into five-level problems, there are 'no problems, 'little problems, 'moderate problems, 'severe problems', and 'unable to do/extreme problems'. Index value was calculated using EQ-5D index value calculator for Colombia [40]. There was no index value calculator for Indonesia. Furthermore, there was the EQ-VAS that could assess the number of health felt by patients on that day with a range of values from 0-100, where zero was the worst condition felt by patients. Before being interviewed, we gave explanation to all subjects about the purpose of the study and the subjects had to agree to be interviewed. All subjects were informed that all data we obtained would be kept confidential.

Statistical analysis

The collected data was processed using the Statistical Package for Social Science (SPSS) software package version 26.0. Patient characteristics were presented in percentage and median values. QoL was presented in percentage, average value, and range. Bivariate analysis was tested using the cross-tabulation Gamma, Kruskal-Wallis and post hoc Mann-Whitney test. P value<0.05 was considered as statistically significant.

Ethical clearance

The study procedure was approved by the Ethical Committee of Wangaya Hospital in Denpasar Bali Indonesia with register number: 05/RSUDW/litbang/2019). The study was conducted following the Declaration of Helsinki. Written informed consent was obtained from all the participants.

RESULTS

A total of 584 participants (PLWHA) taking HAART for at least 3 mo were willing to be interviewed in this study. Most of PLWHA were male 333 (57%). The median of age was 39 y (age range 17-79 y) with the highest percentage of patients were 30-39 y. Most participants had a high school education (60.8%), married (69.2%), and employed (89.6%). The participants were at symptomatic HIV stage (76.7%), HIV transmission route non-intravenous drug user (99.5%), median CD4+cell count 305.50 cells/mm^{3}with the highest range of CD4+cell counts>200 cells/mm^3 (47.6%), and the good adherence of HAART (97.4%). The median duration of HIV infection was 47 mo. The median duration of HAART treatment was 43 mo, with most participants had treatment for more than 24 mo (67.2%). Complete socio-demographic and clinical data of the participants can be seen in table 1.

Table 1: Socio-demographic and clinical characteristics of participants and the association with quality of life

Variables	N	%	EQ-VAS	Index value
			p-value	p-value
All participants	584	100.0		
Gender				
- Male	333	57.0	0.106	0.047*
- Female	251	43.0		
Median of age (years)	39.0			
Age				
- <30 y	97	16.6	0.747	0.731
- 30-39 y	222	38.0		
- 40-49 y	162	27.7		
- 50-59 y	77	13.2		
- ≥60	26	4.5		
Educational status				
- Elementary school	49	8.4	0.455	0.406
- Junior high school	102	17.5		
- Senior high school	355	60.8		
- Academy/University	78	13.4		
Marital status				
- Single	404	69.2	0.027*	0.023*
- Married	114	19.5		
- Divorced or widowed	66	11.3		
Occupation				
- Yes	523	89.6	0.419	0.516
- No	61	10.4		
Transmission routes				
- IV drug user	3	0.5	0.417	0.428
- Non-IV drug user	581	99.5		
Median CD4+cell count (cells/mm^3)	305.50			
CD4+cell count (cells/mm^3)				
- ≤200	142	24.3	0.167	0.160
- 201-349	102	17.5		
- 350-499	90	15.4		
- ≥500	86	14.7		
- Missing data	164	28.1		
WHO clinical stage				
- Asymptomatic	63	10.8	0.001*	0.001*
- Symptomatic	448	76.7		
- AIDS	73	12.5		
Adherence of HAART				
- Good	569	97.4	0.005*	0.002*
- Poor	15	2.6		
Median of HIV infection duration (months)	47.0			
Median of treatment duration (months)	43.0			
Treatment duration				
- ≤24 mo	197	33.7	0.001*	0.003*
- 25-48 mo	138	23.6		
- ≥49 mo	249	42.6		

Abbreviation: HAART= highly active antiretroviral therapy, Note *significant p<0.05

Table 2: EQ-5D-5L profile of participant (PLWHA) by different disease stage

Dimension	Asymptomatic	Symptomatic	AIDS	all	p-value
Mobility					<0.00*
• No problems	63 (100.0)	445 (99.3)	64 (87.7)	572 (97.9)	
• Slight problems	0 (0.0)	1 (0.2)	2 (2.7)	3 (0.5)	
• Moderate problems	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
• Severe problems	0 (0.0)	0 (0.0)	3 (4.1)	3 (0.5)	
• Unable to	0 (0.0)	2 (0.4)	4 (5.5)	6 (1.0)	
Self-care					<0.00*
• No problems	63 (100.0)	446 (99.6)	66 (90.4)	575 (98.5)	
• Slight problems	0 (0.0)	0 (0.0)	1 (1.4)	1 (0.2)	
• Moderate problems	0 (0.0)	0 (0.0)	1 (1.4)	1 (0.2)	
• Severe problems	0 (0.0)	0 (0.0)	3 (4.1)	3 (0.5)	
• Unable to	0 (0.0)	2 (0.4)	2 (2.7)	4 (0.7)	
Usual activity					<0.00*
• No problems	63 (100.0)	446 (99.6)	64 (87.7)	573 (98.1)	
• Slight problems	0 (0.0)	0 (0.0)	4 (5.5)	4 (0.7)	
• Moderate problems	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
• Severe problems	0 (0.0)	1 (0.2)	4 (5.5)	5 (0.9)	
• Unable to	0 (0.0)	1 (0.2)	1 (1.4)	2 (0.3)	
Pain/Discomfort					<0.00*
• No problems	63 (100.0)	426 (95.1)	53 (72.6)	542 (92.8)	
• Slight pain	0 (0.0)	15 (3.3)	11 (15.1)	26 (4.5)	
• Moderately pain	0 (0.0)	5 (1.1)	2 (2.7)	7 (1.2)	
• Severe pain	0 (0.0)	1 (0.2)	4 (5.5)	5 (0.9)	
• Extreme pain	0 (0.0)	1 (0.2)	3 (4.1)	4 (0.7)	
Anxiety/depression					0.002*
• No problems	57 (90.5)	413 (92.2)	52 (71.2)	552 (89.4)	
• Slightly	4 (6.3)	23 (5.1)	11 (15.1)	38 (6.5)	
• Moderately	2 (3.2)	10 (2.2)	7 (9.6)	19 (3.3)	
• Severely	0 (0.0)	2 (0.4)	3 (4.1)	5 (0.9)	
• Exteremely	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	

Note *significant p<0.05

Quality of life for participants (plwha)

Table 2 shows the profile of QoL among participants (PLWHA) based on different clinical stages of HIV. We found the highest proportion of patients reporting 'no problem' on the 'self-care' dimension. Only a small proportion of participants were reported 'very poor' state, The highest proportion of 'very poor' state was in the 'mobility' dimension. In addition, it was found that the clinical stage of HIV was significantly related to the five dimensions of QoL of PLWHA in this study. Median of EQ-VAS was 100.0 (range 30–100). Median of EQ-5D index value was 1.0 (range-0.514–1.0). Table 1 shows the association between variable groups and EQ-VAS or EQ-5D index value.

DISCUSSION

The QoL of PLWHA, who came into Merpati Clinic at Wangaya Hospital in Denpasar, Bali, Indonesia are assessed with the EQ-5D-5L instrument issued by the EuroQoL which consists of five dimensions including mobility, self-care, usual activity, pain/discomfort, dan anxiety/depression. Mobility is the patient's ability to walk. Self-care is the patient's ability to care for themselves such as bathing and dressing. Usual activity is daily activities such as work, study, do housework, family activities or recreation. Pain/discomfort is the feeling of pain/discomfort felt by the patient at present. Anxiety/depression is anxiety or depression/sad feeling felt by the patient at present. This instrument can present the EQ-5D-5L profile, EQ-5D index value, and EQ-VAS [31]. We also assess the relationship between the patient's characteristic variables with the EQ-5D index value and EQ-VAS.

The socio-demographic and clinical characteristics of participants in this study can be seen in table 1. These findings were similar to some health-related QoL (HRQOL) studies in other PLWHA in various countries [41-43]. Based on the five EQ-5D-5L domains, the most domains with 'no problem' state in this study were self-care and usual activity. The results of this study are the same as two previous studies by Keaei M *et al.* in Colombia and Tran BX *et al.* in Vietnam about HRQOL in PLWHA that also use the EQ-5D-5L instrument. They reported the most dimensions with 'no problem' state were self-care and usual activity [40, 43]. The most domains with 'very poor' state in this study were mobility, pain/discomfort, and self-care. The results were different from the two previous studies. The 'very poor' state in the Keaei M *et al.* study was mostly in pain/discomfort (4.35%) and anxiety/depression (2.17%) domains, while Tran BX *et al.* study was anxiety/depression (4.5%) and usual activities (3.4%) [40, 43].

Here we found, most of our participants had a 'slight problem' in the anxiety/depression (6.5%) and pain/discomfort (4.5%) domains. More attention is needed because PLWHA with anxiety/depression and pain/discomfort were reported to have poorer outcomes [41]. Most participants in this study were married (69.2%). Single PLWHA were related to better QoL in the EQ-5D index value (p=0.023) and EQ-VAS (p=0.027). Married PLWHA 5.7 (1.8-18.5) times more likely to have severe depression compared to single PLWHA (p<0.01) [25]. PLWHA with severe depression had significantly worse QoL by 2.7 times, therefore, it is important for us to keep patients from falling into severe depression [25]. The presence of problems in the anxiety/depression domain indicated the need for psychological support for PLWHA, especially the female during HAART treatment [41, 44]. Social support is also important because it can increase the QoL [28]. EQ-5D-5L profile in this study is significantly associated with HIV clinical stage (p<0.05) (table 2).

The median EQ-5D index value and EQ-VAS obtained were 1.0 (range-0.514–1.0) and 100 (range 30–100), respectively. The Columbia study also reported a good QoL with the mean EQ-5D index value and EQ-VAS of PLWHA in that study were 0.85±0.21 and 84.38±14.27, respectively [40]. Another study in Vietnam reported a lower QoL with EQ-5D index value of 0.65 (SD=0.27) 95% CI 0.63-0.67 and mean VAS 70.3 (SD=19) 95% CI 69.2-71.5, respectively [43]. However, another study in Ghana reported QoL on the question of health satisfaction of PLWHA. They mostly appraised their health as excellent (77.85%) and (6.96%) as good [44].

The factors that significantly associated with QoL should have a p-value<0.05 on both with EQ-5D index values and EQ-VAS. Our study revealed that male sex is related to better QoL in the EQ-5D index value (p=0.047), but not to EQ-VAS (p=0.106). These findings are similar to the previous study that men have a higher EQ-5D index value than women (p = 0.002); however, not significant for EQ-VAS (p = 0.842) [41].

Factors significantly associated with QoL both with EQ-5D index values and EQ-VAS included marital status, HIV clinical stage, treatment adherence, and duration of treatment (table 1). In the marital status variable, married participants had higher EQ-VAS scores and EQ-5D index values compared to unmarried patients (p=0.011). This was slightly different from previous studies that reported unmarried/single PLWHA had better QOL [43, 45].

In the variable HIV clinical-stage, participants with AIDS clinical stage have lower EQ-VAS scores and EQ-5D index values compared to asymptomatic and symptomatic stages, p=0.001 and p=0.001, respectively. These findings are similar to some previous studies, in which the factors that influence the poorer quality of life are more advanced HIV clinical stages [42-46]. Only a few participants in our study are in AIDS clinical stage (12.5%).

In the treatment adherence variable, participants with good treatment adherence have higher EQ-VAS scores and EQ-5D index values compared to poor treatment adherence, p=0.005 and p=0.002, respectively. Most participants in our study have good adherence to HAART (97.4%). Participants with a treatment duration of HAART less than 24 mo have lower EQ-VAS scores compared to participants who have been treated for 25-48 mo and more than 49 mo, p=0.001 and p=0.005, respectively. They also have lower EQ-5D index values compared to participants who have been treated for 25-48 mo and more than 49 mo, p=0.011 and p=0.003, respectively. These findings are similar to some previous studies that the duration of treatment for more than 24 mo has a better quality of life [42, 44].

In this study, age, educational status, employment status, HIV transmission route, and CD4+cell count are not statistically significant related to QoL (table 1). These findings are similar to some previous studies [28,44,48]. However, according to some studies, higher education**,** being employed, CD4+cell counts 200 cells/mm^3 or more are associated with better QoL [42-45].

The QoL of participants (PLWHA) receiving HAART therapy are very important to evaluate and it as a reflection of the quality and effectiveness of healthcare services, medication adherence, and outcomes. Overall, the QoL of PLWHA in this study is good. The associated factors are: gender (most of the participants are male), a higher education status, married, employed, a good treatment adherence, CD4+cell count above than 200 cells/mm^3, and treatment duration more than 24 mo.

CONCLUSION

The QoL of PLWHA on HAART in this study was generally good. Our study demonstrated the relationship between male sex, married, good adherence, and treatment duration>24 mo to a better QoL. The advanced HIV clinical stage of PLWHA showed a relationship to poor QoL. The regular assessment of HRQOL among PLWHA in the monitoring and evaluation of HAART treatment is necessary. Good QoL can be taken as the goal for HIV treatment to have a successful HAART therapy.

ABBREVIATION

CD4+= Cluster differentiation 4+, EQ-5D-5L = EuroQol five-dimensional questionnaire, EQ-VAS= EuroQol visual analogue scale, HAART = Highly Active Anti Retroviral Therapy, HIV = human immunodeficiency virus, HRQOL = health-related QoL, PLWHA = People living with HIV/AIDS, QoL = Quality of Life

STUDY LIMITATIONS

This study had several limitations. First, this study was only a single-center study. Second, we used a cross-sectional study design so it is not enough to prove the causal relationship. The strengths of this study were a large number of patients and they had the authority to assess the condition of their health, thereby reducing bias in the assessment.

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CONFLICTS OF INTERESTS

The author reports no conflicts of interest related to this study.

AUTHORS CONTRIBUTIONS

All of the authors contributed to data analysis, drafting and revising the article, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

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