ORIGINAL RESEARCH

Quality of Life of People Living with HIV on Antiretroviral Therapy: A Cross-Sectional Study in Monastir, Tunisia

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Introduction: Despite the benefits of an efficient antiretroviral therapy (ART), HIV/AIDS epidemic still represents the most seriousaffection worldwide that negatively impacts people's quality of life (QoL). As no studies exist on QoL in Tunisia, the aim of the present work was i: to assess, based on WHOQOL-HIV BREF tool, the perception of QoL of people living with HIV (PLHIV) receiving ART and ii: to investigate the relationship between socio-demographic features, disease-related variables and QoL domains' mean scores.

Methods: This cross-sectional study was conducted at the department of infectious diseases of F. Bourguiba Teaching Hospital in Monastir, Tunisia. One hundred and five participants receiving ART were involved. QoL assessment was based on the WHOQOL-HIV Bref including six domains with 29 items with scores ranged from the lowest (4) to the highest (20). Results were reported as frequencies and means (±SD). The Student's t-test for independent samples and the one-way ANOVA were performed to assess differences in QoL mean scores. Linear regression analysis was used to investigate predictors of QoL. The confidence interval was set at 95%.

Results: Clients' mean age was 39.20±10.18 years old with a male to female sex ratio of 3.12. Low mean scores were seen with the environment (12.34±2.90), social relations (12.58±3.94) and psychological domains (12.76±3.31), and moderate mean scores were noted for the physical (14.11±3.52), the spiritual (14.05±3.78) and the level of independence (13.98±3.57) domains. Regression analysis showed that health status and feeling healthy were related to all QoL domains and that profession, marital status and the presence of a confident person were related to environment and spiritual domains.

Conclusion: QoL of PLHIV on ART is affected. Concrete measures and strategies should be undertaken by healthcare stakeholders to improve QoL determinants.

Keywords: people living with HIV, WHO quality of life, Tunisia

Introduction

The HIV/AIDS epidemic still represents the most serious afection worldwide. In 2021, an estimated 38.4 million of people are living with HIV (PLHIV) with a higher frequency and severity in sub-Saharan Africa and Asia and an estimated 650.000 HIV-related deaths. Indeed, 28.7 million people are accessing antiretroviral treatment (ART).[1] People from all over the world are experiencing hard times due to the COVID-19 pandemic and its social, economic and health impact, particularly in PLHIV with limited access to treatment and health care. HIV positive people with co-morbidities are at higher risk of being infected with SarsCov-2.[2] According to WHO, an additional 500.000 AIDS related deaths could be recorded by the end of 2021 in sub-Saharan Africa, in case of a six-month disruption to medical supplies.[3] The MENA region (Middle East and North Africa) is considered as a "real black hole" in terms of HIV/AIDS data[4] and is still far from the 95-95-95 UNAIDS and WHO prevention program targets.[1] The estimated reported number of PLHIV is 180.000 (150. 000–210. 000) and only 88.000 are accessing ART.[1] HIV infection has increased by 22% over the last

years.[3] In fact, despite the low prevalence, less than 1%, HIV infection is on the rise, particularly for key populations like people who inject drugs, men who have sex with men and female sex workers.[1,4–10] In Tunisia, the 2022 estimated number of PLHIV is 7.100 (5.200–10.000) with a prevalence rate <0.1 [<0.1–0.1] for adult aged 15 to 49 years old.[11] This population is still marginalized with poor access to diagnosis, treatment and prevention because of discriminatory attitudes.[12] This social behaviour has a negative impact on people's quality of life (QoL) despite the significant improvement of their life expectancy thanks to the efficacy of antiretroviral therapy (ART) that significantly decreases co-morbidities and HIV-related deaths.[13–19]

According to WHO, QoL is defined as

indIviduals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns.[20]

Although lacking in the MENA region, several studies using various tools or instruments have been reported to evaluate the impact of clinical determinants on QoL. These tools are based on a self-administered questionnaire investigating people's physical, social relations, environmental, psychological or mental health and spiritual and religious beliefs as well.[21–25] Results recorded as mean scores of QoL domains vary according to studies. They are, particularly, low or very low in some African and Middle East countries Unemployment and financial issues affect negatively people's social relation, the level of independence and mental health, as well.[26–28] Some studies reported a better perception of QoL in clients receiving ART[29,30] and other findings confirmed the benefits of ART initiated at 1 month and 4 months[31] and one year[13] after clients' enrolment, compared to ART naïve clients with symptoms and AIDS-related comorbidities.[25] In fact, people receiving ART reported better physical function that positively affects their level of independence.

Therefore, as no studies exist on QoL in Tunisia, the aim of the present work was i: to assess, based on WHOQOL-HIV BREF tool, the perception of QoL of Tunisian HIV people on ART and ii: to investigate the relation between socio-demographic features, disease-related variables and QoL domains' mean scores. The following hypotheses were considered: the null hypothesis (H0) assuming that QoL of PLHIV receiving ART is not affected and an alternative hypothesis (H1) assuming that QoL of PLHIV receiving ART is affected.

Methods
Clients' Enrolment and Data Collection
This cross-sectional study, conducted following the STROBE checklist (strengthening the reporting of observational studies in epidemiology)[32] was performed at the department of infectious diseases of F. Bourguiba teaching hospital in Monastir, Tunisia. The department is characterised by the existence of a day hospital dedicated for the diagnosis, treatment and follow-up of 150 PLHIV. Most of the clients are from different parts of Tunisia and some are from foreign African countries. The team is composed of specialized physicians, nurses, a pharmacist, a psychologist a social assistant and medical secretaries. Counselling services are provided in a counselling room. The medical team collaborate with all clinical and biological specialties related to PLHIV health (cardiology, endocrinology, radiology, dermatology, oral medicine, biology…).

Clients already scheduled for a routine clinical and biological follow-up and ART pick-up were enrolled according to the following inclusion criteria: i: aged more than 18 years with confirmed HIV disease and not known psychiatric illness, understand the Arabic language and consent to answer voluntarily the questionnaire. Clients excluded from the study were: children aged between 7 and 11 years old (n = 5), non-consenting individuals (n = 8), clients treated for neurological disorders (n = 2), and those who do not understand the Arabic language (n = 30). Each client answered the questionnaire in a private room for 10 minutes, after a discussion with the physician about the objectives and outcomes of the survey.

Data collection was performed from 8.30 a. m to 2 p. m, 3 days per week over a period of 4 months, from December 2021 to March 2022. The overall number of individuals included was 105.

The present study is part of Latifa Berrezouga research project on PLHIV that was approved by the committee of ethics of the faculty of pharmacy, University of Monastir, Tunisia, under the reference CER-SVS/ISBM 013/2020 with respect to Helsinki declaration. Verbal and written consent was obtained from every consent client.

WHOHIVQOL-Bref Instrument

WHOQOL-HIV-Bref instrument[21] [Annex 1] is a short version of the WHOQOL-HIV (120 items) developed by researchers from UNAIDS and WHO aiming at assessing QoL of PLHIV. This tool is a self-administered questionnaire including two parts. The first one concerns personal information related to age, sex, education level, marital status, health status, HIV onset, HIV-related symptoms and HIV transmission. The questionnaire was supplemented with questions about the living place, profession, consulting with a psychologist, and the person informed about the individual's HIV status. ART duration and CD4 T lymphocytes' counts were obtained from clients' medical files.

The second part comprises 31 items or questions randomly allocated and scored on a Likert-scale from 1 (lowest) to 5 (highest). Of these, 29 questions investigate six domains: physical, psychological, level of independence, social relations, environmental and spiritual/religious/beliefs domains. Briefly, the physical domain examines 4 items: pain, HIV-related symptoms, energy and sleep. The psychological domain examines 5 items: life enjoy, ability to concentrate, bodily appearance, self-satisfaction and negative feelings. The level of independence examines 4 items: treatment dependence, daily activities and capacity to function and work. The social relationships domain examines 4 items: acceptance by others, personal relationship and social interaction, sexual activities and social support. The environment domain examines 8 items: daily life safety, environment healthiness, financial resources, information availability, leisure activities, health services access, living place and transport. The spiritual domain examines 4 items: life meaningful, blame, fear of the future and death worries. The last 2 questions are related to the overall QoL (Q1) and general health perception (Q2). Before computing, the scores of negatively phrased questions (Q3, 4, 5, 8, 9, 10 and Q31) were inverted. The scores' domains were obtained by calculating the sum of scores of "n" questions of each domain, divided by the number of domain questions. The result was multiplied by 4. Therefore, QoL is assessed from the lowest score being 4 to the highest score being 20 (Table 1).

In the present study, a valid and a reliable literary Arabic version of the questionnaire was used.[33–35] Two authors, L.B & I.K conducted a pilot study including 32 clients to test the questionnaire and improve any ambiguities. In fact, illiterate individuals or individuals having a low level of education (primary school) have been assisted to answer the questionnaire.

Statistical Analysis

Data analysis was performed using SPSS vs 21.0 software (Statistical Package for Social Sciences) for windows. Results were reported as frequencies, and means (±standard deviation). Independent *t*-test for dichotomous variables and one-way ANOVA for ordinal and nominal variables were used to assess differences in means' QoL in relation to independent variables. Linear regression analysis was performed in enter method to evaluate the association of independent variables (predictors) with all QoL domains (dependent). The confidence interval was set at 95% and therefore the results were considered significant when $p < 0.05$.

Table 1 WHO Quality of Life HIV-Bref Instrument

	Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	Domain 6	Q1	Q2
Type	Physical	Psychological	Level of independence	Social/Relations	Environmental	Spiritual/ Religious/beliefs	Overall QoL/General health perception	
Questions (Qs)	Q3, Q4, Q14, Q21	Q6, Q11, Q15, Q24, Q31	Q5, Q20, Q22, Q23	Q17, Q25, Q26, Q27	Q12, Q13, Q16, Q18, Q19, Q28, Q29, Q30	Q7, Q8, Q9, Q10		
Reverse & recode negative phrased items		Q3, Q4, Q5, Q8, 9, 10, Q31		1=5, 2=4, 3=3, 4=2, 5=1				
Compute	Sum of Qs/4x4	Sum Qs/5x4	Sum of Qs/4x4	Sum of Qs/4x4	Sum of Qs/8x4	Sum of Qs/4x4		
Results								
Lowest score	4	4	4	4	4	4	1	
Highest score	20	20	20	20	20	20	5	

Note: Data from World Health Organization.[21]

Results

Male individuals were predominant (74.3%) comparing to female (25.7%) with a sex ratio of 3.12. The mean age was 39.20±10.18 years old. Nearly 60% of the clients (58.09%) were aged in the 15–40 age group and slightly more than 40% (41.91%) were aged more than 40 years. As for education level, 37.1% and 34.3% of the clients had a secondary and a university level, respectively. Almost equal percentages were noted between single (41%) and married people (40%). Most of the clients live in an urban area (71.4%) and only 33.4% are owner of their house. Indeed, more than half (53.3%) of the population have no job. When asking clients about their health status and whether they see a psychologist, 55.2% qualified their health status as "neither poor not good" and 82.9% denied being followed by a psychologist. Moreover, only one member of a family (39%) or a friend (43.8%) was informed about client's HIV status. Regarding symptoms, the majority (90.6%) of the clients reported no HIV-related symptoms and 60.9% of respondents did not consider themselves ill. The mean period of seropositivity was 10.24±7.77 years. Nearly 60% of the individuals were diagnosed as HIV positive in a period ranged between 1 and 10 years. CD4 T lymphocytes count was available for 88 clients with a mean of 618.72±291.56 cells/mm^3. Slightly more than 60% (61%) had a CD4 count >500 cells/mm^3 and only 4 clients (4.5%) had a CD4 count <200/mm^3. The most frequent mode of HIV transmission was heterosexual with a man or a woman, 40% and 36.2%, respectively. People using intravenous drugs were recorded in only 11.4% (Table 2).

The results of QoL domains and the overall QoL as well are depicted in Table 3. The mean score for all domains was 13.30±3.50. The lowest means were seen with the environment (12.34±2.90), social relations (12.58±3.94) and psychological domains (12.76±3.31) and the highest mean scores were noted for the level of independence (13.98±3.57), the

Table 2 People Living with HIV Personal Data and Clinical Determinants (n = 105)

Variables	Number	Percentage %	Mean (SD)
Sex			
Male	78	74.3	
Female	27	25.7	
Age /years			39.20±10.18
<40	61	58.09	
≥40	44	41.91	
Education level			
None	4	3.8	
Primary education	26	24.8	
Secondary education	39	37.1	
University	37	34.3	
Marital status			
Single	43	41	
Married	42	40	
Divorced	13	12.2	
Widowed	7	6.8	
Residence area			
Urban	75	71.4	
Rural	30	28.6	
Habitation			
Owner	35	33.4	
Tenant	41	39	
Others	29	27.6	
Profession			
Yes	49	46.7	
No	56	53.3	
Attending psychologist			
Yes	18	17.1	
No	87	82.9	

(*Continued*)

Table 2 (Continued).

Variables	Number	Percentage %	Mean (SD)
Health status			
Very poor	3	2.9	
Poor	7	6.7	
Neither poor not good	58	55.2	
Good	28	26.7	
Very good	9	8.5	
Person informed about HIV status			
None	18	17.2	
Family	41	39	
Friend	46	43.8	
HIV status			
Asymptomatic	95	90.6	
Symptomatic	10	9.4	
Feel ill			
Yes	40	61.9	
No	65	38.1	
CD4 count			618.72±291.56
<500mm^3	34	38.6	
≥500	54	61.4	
HIV duration			10.28±7.77
≤10 years	61	58.1	
>10 years	44	41.9	
ART duration			7.95±5.65
≤10 years	78	74.3	
> 10 years	27	25.7	
HIV transmission			
Sex with a man	42	40	
Sex with a woman	38	36.2	
Injecting drugs	12	11.4	
Blood/products	3	2.9	
Others	10	9.5	

Table 3 Means and SD of Quality of Life Domains

QoL Domains	Physical	Psychological	Level of Independence	Social Relations	Environmental	Spiritual	Q1	Q2
Min	4	4	4	4	5,5	4		
Max	20	20	19	20	20	20		
Mean	14.11	12.76	13.98	12.58	12.34	14.05	3	3.41
SD	3.52	3.31	3.57	3.94	2.90	3.78	0.92	1.08

Abbreviations: Min, minimum; Max, maximum; Q1, overall QoL; Q2, general health perception.

physical (14.11±3.52) and the spiritual domains (14.05±3.78). Mean scores for the overall QoL and general health perception were 3±.92 and 3.41±1.08, respectively.

As for the association between the mean scores of QoL domains and the clients' socio-demographic features and some disease-related variables, the Student's *t*-test for independent samples showed a significant association between profession and QoL domains. Higher means in physical, psychological, level of independence, and environmental domains were seen in clients with a job compared to those with no job. Indeed, individuals who did not consider themselves ill presented significantly higher mean scores in all QoL domains (Table 4).

Table 4 Mean Differences in QoL Domains Using Independent *t*-Test in PLHIV (n = 105)

QoL Domains/ Variables	Physical	Psychological	Level of Independence	Social Relations	Environmental	Spiritual
Sex						
Male	14.15	12.91	14.03	12.62	12.35	14.03
Female	14	12.32	13.81	12.48	12.33	14.11
p. value	0.84	0.34	0.78	0.88	0.97	0.92
Age						
<40 years	14.01	12.55	13.72	12.72	12.31	13.57
≥40 years	14.25	13.05	14.34	12.39	12.39	14.70
p. value	0.73	0.44	0.38	0.67	0.88	0.13
Profession						
Yes	14.87	13.37	14.73	13.21	13.17	14.43
No	13.24	12.05	13.12	11.86	11.39	13.61
p. value	0.01*	0.04*	0.02*	0.07	0.000**	0.27
Residence area						
Urban	14.09	12.81	14.20	12.36	12.32	13.87
Rural	14.16	12.64	13.43	13.13	12.41	14.50
p. value	0.92	0.81	0.32	0.36	0.87	0.44
HIV duration						
≤10 years	14.32	12.85	14.11	12.57	12.32	13.77
>10 years	13.81	12.63	13.79	12.59	12.37	14.43
p. value	0.46	0.74	0.65	0.98	0.93	0.37
ART duration						
≤10 years	14.10	12.78	14.02	12.42	12.39	13.94
>10 years	14.14	12.69	13.85	13.04	12.20	14.37
p. value	0.95	0.90	0.82	0.48	0.76	0.61
HIV status						
Asymptomatic	14.17	12.84	14.08	12.65	12.26	14.18
Symptomatic	13.63	12.07	13.09	12	13.09	12.91
p. value	0.63	0.46	0.38	0.60	0.37	0.29
Feel ill						
Yes	12	11.26	12.67	11.43	11.35	12.63
No	15.41	13.66	14.78	13.29	12.96	14.92
p. value	0.000**	0.000**	0.003**	0.01*	0.005**	0.002**
CD4 count						
<500mm³	14.41	12.98	14.26	12.47	12.60	14.82
≥500mm³	13.88	12.65	13.63	12.48	11.85	13.72
p. value	0.49	0.64	0.43	0.99	0.24	0.18
Psychologist						
Yes	14	12.93	14.16	12.11	12.69	14.06
No	14.13	12.72	13.49	12.68	12.27	14.05
p. value	0.13	0.81	0.81	0.58	0.58	0.99

Notes: *Significant; **strongly significant.

The one-way ANOVA analysis showed a strong association between the education level and the physical domain, the level of independence and the environmental domains, a significant association between the marital status and all QoL domains except for the psychological domain and a strong association of the clients' health status and all QoL domains (Table 5).

Results of multiple linear regression analysis (Table 6) showed that all QoL models were statistically significant (p = 0.000). Health status and feeling healthy were found to be strong predictive independent variables associated with all QoL domains (p = 0.000). Indeed, profession, an informed person about the client's HIV status as well as marital status were significant predictors associated with the environmental and the spiritual domains (p < 0.05) (Table 6).

Table 5 Mean Differences in QoL Domains in PLHIV Using One-Way ANOVA (n = 105)

QoL Domains/ Variables	Physical	Psychological	Level of Independence	Social Relations	Environmental	Spiritual
Education level						
None	[a]_	_	_	_	_	_
Primary	12.46	11.90	12.38	11.27	11.25	13.78
Secondary	14.38	12.93	13.71	12.72	12.01	13.81
University	14.86	13.21	15.21	13.25	13.47	14.28
p. value	0.002**	0.28	0.006**	0.13	0.008**	0.82
Marital status						
Single	14.26	12.83	14.74	12.21	12.86	13.70
Married	14.65	13.11	13.81	13.50	12.19	15.07
Divorced	11.69	10.86	11.92	10.54	10.65	12.23
Widowed	[b]_	_	_	_	_	_
p. value	0.02*	0.10	0.04*	0.04*	0.05*	0.04*
Habitation						
Owner	14.14	13.22	13.97	12.51	13.04	14.26
Tenant	14.07	12.28	13.80	12	11.73	13.44
Others	14.13	12.88	14.24	13.48	12.37	14.66
p. value	0.99	0.45	0.88	0.30	0.14	0.38
Health status						
Very poor/poor	8.20	9.16	9.10	7.08	9.00	10.40
Neither poor not good	13.91	12.54	13.51	12.52	11.99	14.21
Good/very good	16.02	14.07	16.02	13.97	13.81	14.78
p. value	0.000**	0.000**	0.000**	0.000**	0.000**	0.004**
Informed Person						
None	13.05	12.44	12.44	11.28	10.38	13.22
Family member	14.65	13.35	14.26	13.39	13.04	15.07
Friend	14.04	12.43	14.32	12.37	12.48	13.46
p. value	0.27	0.33	0.13	0.14	0.004**	0.08
HIV transmission						
Sex with a man	14.21	12.70	14.00	12.38	12.78	13.69
Sex with a woman	13.78	12.67	13.63	12.18	11.96	14.45
Injecting drugs	13.91	12.33	14.75	12	11.75	12.42
Others	14.92	13.60	14.23	14.92	12.61	15.54
p. value	0.78	0.78	0.81	0.14	0.52	0.16

Notes: [a,b]Not included, *significant, **strongly significant.

Table 6 Multiple Linear Regression Analysis

Models	Variables	Coefficient	Standard Error	t	P-value	Adjusted R-Squared
Physical	Constant	7.02	1.36	5.16	0.000	0.30
	Education level	−0.04	0.36	−0.11	0.91	
	Marital status	-0.39	0.32	−1.21	0.22	
	Profession	0.68	0.61	1.11	0.26	
	Feel ill	−0.47	0.63	−5.41	0.000**	
	Informed person	0.05	0.41	0.57	0.56	
	Health status	2.277	0.368	6.19	0.000**	

(Continued)

Table 6 (Continued).

Models	Variables	Coefficient	Standard Error	t	P-value	Adjusted R-Squared
Psychological	Constant	8.24	1.42	5.77	0.000	0.13
	Education level	–0.04	0.37	–0.87	0.38	
	Marital status	-0.30	0.34	-0.87	0.38	
	Profession	0.72	0.64	1.12	0.26	
	Feel ill	–0.35	0.62	–3.87	0.000**	
	Informed person	-0.02	0.41	-0.31	0.75	
	Health status	1.43	0.38	3.73	0.000**	
Level of independence	Constant	6.87	1.44	4.76	0.000	0.24
	Education level	0.30	0.38	0.79	0.42	
	Marital status	–0.20	0.34	–0.57	0.56	
	Profession	0.64	0.64	0.99	0.32	
	Feel ill	–0.28	0.68	–3.04	0.003**	
	Informed person	0.15	0.45	1.64	0.10	
	Health status	1.96	0.39	5.05	0.000**	
Social relations	Constant	8.15	1.71	4.76	0.000	0.12
	Education level	0.05	0.45	0.11	0.90	
	Marital status	–0.69	0.41	-1.68	0.09	
	Profession	0.59	0.76	0.76	0.44	
	Feel ill	–0.23	0.77	–2.38	0.019*	
	Informed person	0.04	0.51	0.42	0.66	
	Health status	1.59	0.46	3.45	0.001**	
Environment	Constant	6.83	1.19	5.73	0.000	0.21
	Education level	0.27	0.31	0.88	0.37	
	Marital status	0.01	0.28	0.05	0.95	
	Profession	1.12	0.53	2.10	0.038*	
	Feel ill	–0.26	0.55	–2.85	0.005**	
	Informed person	0.18	0.36	1.95	0.054*	
	Health status	1.30	0.32	4.05	0.000**	
Spiritual	Constant	12.13	1.64	7.36	0.000	0.11
	Education level	–0.73	0.43	–1.67	0.09	
	Marital status	-0.91	0.39	-2.31	0.023*	
	Profession	0.45	0.73	0.61	0.54	
	Feel ill	–0.29	0.73	–3.14	0.002**	
	Informed person	-0.04	0.48	-0.50	0.61	
	Health status	1.46	0.44	3.29	0.000**	

Notes: *Significant; **strongly significant.

Discussion

Our study included a higher number of PLHIV under ART compared to what was reported in the literature.[26,34] To our best knowledge, this is the first study in the Maghreb and amongst the fewest in the MENA region. The scarcity of data in this region could be attributed to social, culture and religious stigma or stereotypes about HIV/AIDS disease, condition that breeds silence about this illness.[19,26–28,36]

As defined by the WHO, QoL refers to the well-being of the individual in the society.[20]

The present study aimed at assessing PLHIV perception of QoL determinants, in the region of Monastir. Tunisia. Although moderate, the overall mean scores of QoL domains were higher than that reported by Khademi et al. In Iran,[10] but lower compared to the study of Osei-Yeboah et al in Ghana,[25] Busi et al in Cameroon,[29] Liping et al in China[37] and Nobre et al in Finland.[38] In fact, the lowest mean scores of QoL were recorded for the social relations, the environment and the psychological domains and the highest mean scores were noted for the physical, the level of independence and the spiritual domains. These findings were comparable to studies conducted in Ethiopia with clients receiving highly active antiretroviral therapy.[14] It is very clear in the literature that people receiving ART have better physical function

that may impact their level of independence. These findings were reported either for people already receiving ART[14,22,25,29,30,34] or after ART initiation at 1–4 months[31] or at one year.[13]

We may conclude that the absence of symptoms in the majority of individuals in the present study (90.6%), the high level of CD4 T lymphocytes (≥500/mm3, 61.4%) and the duration of ART (>10 years, 41.9%) could be attributable to the close clinical and biological monitoring of these clients and the very good adherence to ART thanks to efficient counselling services, thus preventing opportunistic infections and AIDS-related deaths[31,39,40] even if no significant association was recorded with QoL domains.

However, our findings revealed significantly higher mean scores of almost all QoL domains in people with a high level of education (university), having a job, being married, do not consider themselves ill and reported a good/very good health status. These results are in line with several reports.[13,14,22,25,29–31,34] In fact, poor QoL scores have been related to unemployed clients facing financial issues negatively affecting their social relationships, low level of independence resulting in less leisure opportunities affecting their mental health; in addition to poor health status perception, celibacy and a low level of education. Similarly, in Jordan, marital status (single), co-morbidities, unemployment influence negatively people's QoL[34] and in Lebanon, the lowest domain scores were for financial status, sexual functioning, and mental health.[26] Indeed, ART naive clients, and clients with HIV/AIDS symptoms have significantly poorer QoL.[25]

As for regression analysis, marital status, health status, profession, feeling healthy, and having a confident either a friend or a member of the family was found to be strong predictors of QoL. Health status and feeling healthy were significantly related to all QoL domains. Nearly 60% of the population reported their health status as being "neither poor not good". This in between perception (not very poor not very good), even if it indicates a fairly positive perception, may refer to the following spiritual and religious beliefs (fate) in the Tunisian individual in general, and PLHIV, in particular, with the following statements: "Thank God, I'm still alive" or "it's God's will". Unlike Campos et al[31] and Busi et al[29] who reported higher percentages of clients qualifying their health status as "very good/good", 66.4% and 71.8%, respectively.

Finally, the highest scores recorded for the spiritual domain corroborate the results of other authors.[10,24,26,35] As PLHIV feel guilty and bear by themselves the burden of the disease, with no family, social and psychological supports; religion may help them reconstruct their relation with Allah/God; in order to cope with their condition and "accept" to live with their diagnosis. In Tunisia, HIV/AIDS is still considered as a "punishment" from Allah/God because of people's sexual misconduct. Most of the studied clients were isolated and still live with the fear and the shame to be recognized as "dangerous and undesirable individuals" for the community.[27] Unfortunately, only one member of a family (39%) or a friend (43.8%) was informed about their HIV status. This situation clearly denotes that cultural and religious stigmas could be the main barriers for people to access health care services and to be diagnosed and treated at an early stage. In fact, in some developing countries, a high mortality rate is still reported (51%), despite the progress of HIV research and considerable achievements in treatments.[40] Several studies have been conducted to raise the issue of anxiety, depression and discriminatory behaviour related to stigma.[15,41] These studies revealed that the efficacy of ART, good adherence and observance to treatment should be accompanied by rigorous social and psychological interventions.[14,42,43] Because of the stigma-related to psychologists, 82.9% of the studied clients were being deprived of psychotherapy.

It is precisely in that direction that the following interventions and measures should be undertaken by policymakers, health-sector professionals and civil society:[44–50]

- Strengthen education on HIV/AIDS disease, by using modern information and communication technologies;[12]
- Identify key populations and ensure equitable access to prevention and social protection;
- Promote inclusive governance for health;[12]
- Raise peoples' awareness on WHO QoL and well-being and their role to contribute in improving QoL determinants;
- Conduct rigorous research to better collect and analyse data related to QoL in PLHIV;
- Implement the international charter of human rights.[51]

Strengths and Limits of the Study

This first study conducted in Monastir-Tunisia, allows us to understand determinants of health-related QoL of PLHIV. Indeed, comparable results with literature reports prove the importance and the need to explore in-depth socio-psychological determinants and take rigorous actions to improve peoples' QoL. In fact, bias due to the lack of clients' reliable responses may be related to stigma, cultural and social barriers. Moreover, responses obtained by assisted clients who do not understand literary Arabic could be affected, but we think that their limited number (n = 15) has no significant impact on the overall QoL results. It is worth mentioning that literary Arabic version of WHOQOL-Bref, with no cultural adaptations, is applicable in almost all Arabic countries.[33] Major limitations of this cross-sectional study are related to information bias and to the difficulty in establishing a causal inference.[52] Finally, further investigations involving more participants in other regions of Tunisia should be conducted to better assess anxiety and depression related to stigma and discrimination.

Conclusion

The overall QoL determinants for PLHIV in the department of Infectious diseases of Monastir, Tunisia were moderate. Low scores of QoL were recorded for psychological, social and environmental domains, and moderate scores were recorded for physical, level of independence and religious/spiritual domains. The absence of symptoms and the relatively good physical health could be related to a close clinical and biological monitoring of the clients and effective counselling techniques. However, family and social stigma, disclosure and law criminalization, as well, are the main barriers leading to patients' psychological, social and environmental discomfort that affect their daily life. Therefore, all efforts should be implemented by policy decision makers; along with health care professionals and the civil society to combat stigma and defend the right for PLHIV to live decently with dignity and enjoy the full range of guaranteed human rights.

Abbreviations

HIV/AIDS, Human immunodeficiency virus/Acquired immunodeficiency syndrome; PLHIV, people living with HIV; QoL, quality of life; WHO, World Health Organization; ART, antiretroviral therapy.

Data Sharing Statement

All data are displayed in the manuscript. They are available and could be sent upon request from the corresponding author.

Ethics Approval and Informed Consent to Participate

The present study is part of Latifa Berrezouga research project on PLHIV that was approved by the committee of ethics of the faculty of pharmacy, University of Monastir, Tunisia under the reference CER-SVS/ISBM 013/2020. Informed consent was obtained from every participant with respect to the Helsinki declaration.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare that they have no competing interests in this work.

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