Quality of life among people living with HIV/AIDS and its predictors: A cross-sectional study at ART center, Bagalkot, Karnataka

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ABSTRACT

Background: Human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) emerged as one of the most important public health issues of the late twentieth and early twenty-first centuries. Quality of life (QoL) of people living with HIV/AIDS (PLHIV) is affected by multiple variables including depression as a major predictor of QoL. **Aims:** To assess the QoL of PLHIV and its predictors. **Settings and Design:** This cross-sectional study included a sample of 450 PLHIV attending the ART center, District Government Hospital, Bagalkot. **Methods and Materials:** Data were collected using self-report method and Hospital's records. Tools used for data collection included sociodemographic questionnaire, WHOQOLHIV-BREF scale, and Centre for Epidemiologic Studies Depression Scale (CES-D Scale). Bivariate associations were observed through Pearson's correlations, analysis of variance (ANOVA), and *t*-tests. Multiple linear regression analysis was performed to find the significant predictors of QoL. **Results:** Findings revealed a significant negative correlation between the QoL and depression (r = −0.751, $P < 0.001$). A significant regression equation was found ($F_{14, 435} = 57.76$, $P < 0.001$, adjusted $R^2 = 0.64$) when all the variables are considered together for finding the significant predictors of the QoL. Male gender, being graduated, not knowing the mode of transmission have positively predicted the QoL. On the other hand, having primary education, being in nuclear family, having HIV-positive wife, having HIV-positive children, HIV infection through homosexual relationships, history of suicidal attempts, and history of alcohol intake negatively predicted the QoL of PLHIV. Depression was the strongest negative predictor of the QoL of PLHIV ($β = −0.672$, $P < 0.001$). **Conclusions:** Interventions aimed at management of depression among PLHIV attending the ART centers would result in enhancing their QoL.

Keywords: ART center, PLHIV, predictors, quality of life

Introduction

Human immunodeficiency virus (HIV) infection/acquired immunodeficiency syndrome (AIDS) is one of the serious public health problems with severe impact on various facets of human life.[1] At present, in the world, around 36.9 million people are suffering from HIV/AIDS.[2] Every year around 2 million people are infected by this virus.[2] With an HIV prevalence of 0.26% in the adult population, India has an estimated 2.1 million people living with HIV.[3]

Since the availability of antiretroviral treatments (ART), HIV has been turned from a fatal disease to a manageable chronic disease. Hence, people living with HIV (PLHIV) have longer life spans, which create new challenges for health care systems.[4] A PLHIV has to cope up with a range of HIV-related symptoms for their entire life. Symptoms may be related to the infection itself, comorbid illnesses, or iatrogenic effects from HIV-related medications.[5,6] Many of the HIV patients struggle

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with numerous social problems such as stigma, discrimination, poverty, depression, substance abuse, and cultural beliefs, which can affect their QOL.[7] Depression is most prevalent in PLHIV. Stressful life events experienced by PLHIV again increases the risk of development of depression by three to five times more. Hence, HIV/AIDS infection compromises the quality of life (QoL) in PLHIV.[8]

Assessing QoL and its predictors is useful for documenting the patients' perceived burden of chronic disease, tracking changes in health over time, and assessing the effects of treatment. Considering the fact that many sociodemographic and clinical variables, especially depression, influence the QoL of PLHIV/AIDS, the present study aims at assessing the QoL of PLHIV/AIDS at ART center, Bagalkot.

Materials and Methods

Study design and participants

The present study was a descriptive cross-sectional study conducted between July 2017 and December 2017. A convenient sample of 450 PLHIV coming for follow-up counseling at ART Center, District Government Hospital, Bagalkot were selected for the study. PLHIV who were above 18 years of age and willing to participate were included in the study. PLHIV who were positive for less than 2 weeks were excluded because the information from them was asked based on their last 2 weeks experience. PLHIV with severe opportunistic infection were also excluded from the study.

Instruments

Centre for Epidemiologic Studies Depression Scale (CES-D Scale)

Depression was assessed using the Centre for Epidemiologic Studies Depression Scale (CES-D Scale). This is a 20-item self-report measure that asks patients to rate how often over the past week they experienced symptoms associated with depression. Response options range from 0 to 3 for each item (0 = rarely or none of the time, 1 = some or little of the time, 2 = moderately or much of the time, 3 = most or almost all the time). Scores range from 0 to 60, with high scores indicating greater depressive symptoms. Cutoff score is 16, hence, individual who scores 16 or greater suggests significant level of depression. Scale was translated to Kannada and then backtranslated to English. High internal consistency has been reported with Cronbach's alpha coefficients ranging from 0.85 to 0.90 across studies (Radloff, 1977 and Hunter *et al.*, 2003). For the present study, reliability was calculated by administering CES-D scale to 20 PLHIV and Cronbach's alpha coefficient obtained was 0.88.

Quality of Life (WHO Quality of Life – HIV BREF)

QoL was measured using the World Health Organization (WHO) Quality of Life (QOL) HIV short version (WHOQOL-HIV BREF),[9] a 31-item scale that assesses QoL of PLHIV in six domains: physical quality of life, psychological quality of life,

independence, social relationships, environment quality of life, and spirituality/religion/personal beliefs. Overall scores range between 31 (minimum) and 155 (maximum); higher the score, better the QoL. The scale was validated at various setting across the globe including India.[10,11] Scale was translated to Kannada and then backtranslated to English. Cronbach's α of 0.92 was obtained by administering the scale to 20 PLHIV.

Sociodemographic variables and clinical characteristics

Sociodemographic and clinical variables included age, gender (male/female/transgender), religion, occupation, educational status, number of children, monthly income of family, current marital status, type of family, family history of HIV, area of residence, CD4 count, HIV status of spouse, duration of time with HIV infection, duration of time on ART, history of suicidal attempts, and history of alcohol abuse.

Data collection procedures

Prior permissions were taken from relevant institutions prior to data collection. The study participants were indentified during the study period at ART center, District Government Hospital, Bagalkot. Every HIV infected person who fulfilled the inclusion criteria was approached for data collection. Consent was obtained by the interviewers before participants underwent the structured interview which lasted for approximately 20–30 min. All the information collected was based on patient's self report, but the information related to CD4 count and clinical staging were obtained from the medical records.

Data analysis

Data analyses were performed using SPSS v25 (SPSS Statistics for Windows, Armonk, NY: IBM Corp). Descriptive univariate statistics such as frequencies and percentages were used for categorical variables and means (M) and standard deviations (SD) were used for continuous variables. Bivariate associations between QoL and continuous variables (depression, age, family monthly income, CD4 count, duration of HIV infection, duration of ART treatment) were assed using Pearson's correlation coefficients. Differences in mean levels of QoL between categories of dichotomous variables (having children, type of family, area of residence, suicidal history, and alcohol history) were assessed using *t*-test. One-way analysis of variance (ANOVA) was used for multicategory polytomous variables with post-hoc Bonferroni-corrected between group comparisons in case of a significant overall F-value.

Multiple regression model was used to find the significant predictors of QoL. All significance levels reported are two-sided.

Results

Descriptive analyses of sample characteristics

Table 1 shows the characteristics of PLHIV and the mean (M) of QoL for each group. The mean total QoL score was 78.53 (SD = 16.47).

Table 1: Socio-demographic and clinical characteristics of PLHIV			
Variables	Mean	SD	Range
Age (Years)	39.70	10.41	18-73
Family monthly income	7860.67	7805.15	1000-60000
CD4 count	521.92	285.16	41-2501
Duration of HIV infection (Years)	6.18	3.81	0.1-20
Duration of ART treatment (Years)*	4.99	3.22	0.1-15
	n	Percentage	TQoL M (SD)
Sex			
Male	156	34.7	81.09 (17.29)
Female	291	64.7	77.15 (15.87)
Transgender	3	0.67	78.7 (19.30)
Religion			
Hindu	424	94.2	78.70 (16.52)
Muslim	23	5.1	77.59 (15.30)
Others	3	0.7	60.50 (4.98)
Educational status*			
No formal education	220	48.9	78.37 (16.68)
Primary education	106	23.6	75.04 (15.7)
Secondary education	74	16.4	80.52 (14.75)
Pre-university education	35	7.8	80.45 (17.14)
Graduation	15	3.3	91.12 (18.78)
Marital Status*			
Married	273	60.7	79.95 (16.37)
Unmarried	34	7.6	81.76 (16.56)
Widow/Widower	130	28.9	76.03 (16.25)
Separated	13	2.9	65.19 (11.93)
Variables	*n*	Percentage	TQoL M (SD)
Having children			
Yes	378	84.0	77.99 (16.69)
No	72	16.0	81.32 (14.98)
Occupation			
Unemployed	7	1.6	79.53 (18.07)
Housewife	71	15.8	79.33 (16.08)
Labor work	257	57.1	76.94 (16.38)
Agriculture	42	9.3	85.05 (16.38)
Driver	19	4.2	77.44 (16.56)
Business	16	3.6	80.52 (14.14)
Private employee	26	5.8	81.20 (16.18)
Govt. employee	12	2.7	77.65 (14.95)
Type of family			
Joint	162	36.0	78.40 (15.64)
Nuclear	288	64.0	78.60 (16.94)
Area of residence			
Rural	362	80.4	78.95 (16.55)
Urban	88	19.6	76.79 (16.1)
Family history of HIV*			
Husband HIV positive	223	49.6	76.16 (15.79)
Wife HIV positive	82	18.2	74.96 (15.77)
Parents HIV positive	19	4.2	85.19 (12.91)
Child/children HIV positive	11	2.4	68.63 (17.77)
No family history	115	25.6	85.50 (16.29)
Mode of Transmission*			
Heterosexual	227	50.4	71.59 (14.32)

Contd...

Table 1: Contd...			
Variables	Mean	SD	Range
Blood transfusion/Needle prick	23	5.1	74.46 (12.66)
Homosexual	5	1.1	68.00 (4.48)
Unknown	195	43.3	87.35 (15.18)
Clinical Staging*			
Stage I	90	20.0	76.79 (15.15)
Stage II	319	70.9	80.07 (16.68)
Stage III	41	9.1	70.33 (15.00)
History of suicidal attempts*			
Yes	74	16.4	72.56 (16.79)
No	376	83.0	79.70 (16.16)
History of alcohol abuse			
Yes	71	15.8	76.06 (16.79)
No	379	84.2	78.99 (16.39)

The asterisk *indicates variables with a significant correlation with TQoL or with significant TQoL mean difference among categories. TQoL: Total quality of life, M: Mean, SD: Standard deviation, N: Number of PLHIV, %: Percentage of participants, ART: Antiretroviral treatment, PLHIV: People living with HIV/AIDS

Bivariate associations

No differences were found between QoL of childless participants (M = 81.32) in comparison to those with children (M = 77.99, t_{448} = −1.57, P = 0.117). QoL did not differ between PLHIV belonging to joint family (M = 78.40) and PLHIV belonging to nuclear family (M = 78.60, t_{448} = −0.121, P = 0.90), similarly, QoL did not differ between the PLHIV from rural area (M = 78.95) and from urban area (M = 76.79, t_{448} = 1.108, P = 0.27). Participants with no history of suicidal attempts had higher QoL (M = 79. 70) than those with suicidal history (M = 72.52, t_{448} = -3.455, P = 0.001). No significant difference was found between QoL of PLHIV with the history of alcohol abuse (M = 76.07) and PLHIV with no history (M = 78.99, t_{448} = -1.37, P = 0.17).

A significant difference was found for QoL by educational status ($F_{4, 445}$ = 3.87, P = 0.004), and post-hoc Bonferroni test showed that those participants with graduation (M = 91.12) had better QoL than those who had no formal education (M = 78.37, P = 0.035), than with primary education (M = 75.04, P = 0.004). Difference was found in QoL with respect to marital status ($F_{3, 446}$ = 5.096, P = 0.002), post-hoc Bonferroni test showed that unmarried PLHIV had better QoL (M = 81.76) than separated/divorced (M = 65.19, P = 0.011). QoL was significantly different in PLHIV by their family history of HIV ($F_{4, 445}$ = 9.74, P < 0.001) and post-hoc Bonferroni test showed that PLHIV with no family history of HIV had better QoL (M = 85.50) than those with their husband being HIV positive (M = 76.16, P < 0.001), wife being HIV positive (M = 74.96, P < 0.001) and child/children being HIV positive (M = 68.64, P = 0.008).

QoL was different in PLHIV by their mode of transmission of HIV ($F_{3, 446}$ = 42.46, P < 0.001), post-hoc Bonferroni test showed PLHIV who did not known their mode of transmission had better QoL (M = 87.35) than those who were

infected through heterosexual contact (M = 71.59, $P < 0.001$), through blood transfusion/needle prick (M = 74.46, $P < 0.001$), and through homosexual contact (M = 68, $P = 0.021$). Similarly, significant difference was found in QoL of PLHIV by their clinical stage ($F_{2, 447} = 7.17$, $P < 0.001$), post-hoc Bonferroni test showed PLHIV with second stage of HIV illness (M = 80.07) had better QoL than those with third stage of illness (M = 70.33, $P < 0.001$). No significant difference was found in sex groups, religious groups, and PLHIV by their occupation.

Correlations of QoL with age, family monthly income, CD4 count, duration of HIV illness, and duration ART were respectively, $r = 0.021$ ($P = 0.66$), $r = 0.082$ ($P = 0.08$), $r = -0.016$ ($P = 0.742$), $r = -0.001$ ($P = 0.99$) and $r = 0.048$ ($P = 0.31$).

Correlation between Depression and Quality of Life (QoL) of PLHIV and its domains

Correlations between depression and QoL of PLHIV and its domains are presented in Table 2. A significant negative correlation was found between depression and total quality of life with its all domains.

Table 2: Correlation between Depression and Quality of Life (QoL) of PLHIV and its domains	
Correlation between depression and domains of QoL	Correlation coefficients
Physical QoL	0.614***
Psychological QoL	0.700***
Level of independence	0.568***
Social relationships	0.296***
Environment QoL	0.377***
Spiritual/religion/personal beliefs	0.569***
Total quality of life (TQoL)	0.751***

Table 2 shows Pearson's correlations between depression and QoL of PLHIV and its domains, ***P<0.001

Multiple linear regression analysis

Depression, sociodemographic, and clinical characteristics of PLHIV were entered into multiple linear regression model as independent variables with QoL being dependent variable. A significant regression equation was found ($F_{38, 411} = 21.6$, $P < 0.001$, adjusted $R^2 = 0.64$). Several variables did not predict the QoL significantly: age, family monthly income, CD4 count, duration of HIV illness, duration of ART, religion, marital status, and having children. The regression model was recalculated excluding these variables and again a significant regression equation was found ($F14, 435 = 57.76$, $P < 0.001$, adjusted $R^2 = 0.64$). Table 3 presents the results of the final regression model. Male gender, being graduated, not knowing the mode of transmission positively predicted the QoL of PLHIV and having primary education, being in nuclear family, HIV-positive wife, HIV-positive children, homosexual mode of transmission, history of suicidal attempts, and history of being alcoholic negatively predicted the QoL of PLHIV. Depression was the strongest negative predictor of QoL of PLHIV ($\beta = -0.672$, $P < 0.001$).

Discussion

This cross-sectional study included a sample of 450 PLHIV attending the ART center, District Government Hospital, Bagalkot to assess their QoL and its predictors. Findings revealed that the mean of total QoL score was 78.53 (SD = 16.47), which is consistent with that found in many other Indian studies.[12] A significant negative correlation was found between the QoL and depression ($r = -0.751$, $P < 0.001$).

The study identified variables predicting the QoL of people living with HIV/AIDS in India and integrated their contribution in a single regression model, which has explained almost 80% of variance in QoL. Male gender, being graduated, not knowing the mode of transmission have positively predicted the QoL.

Table 3: Multiple linear regression model of quality of life of PLHIV			
Variables	Unstandardized coefficients		n=450
			Standardized coefficients
	B	S.E	β
Sex (Ref: Male)			
Male	5.499	1.4	0.16***
Educational status (Ref: Graduation)			
Primary education	−2.76	1.13	−0.071*
Graduation	8.674	2.732	0.095**
Type of Family (Ref: Nuclear)	−4.398	1.030	−0.128***
Family History of HIV (Ref: No family history)			
Wife HIV positive	-6.718-6.875	1.507	-0.158***
Child/children HIV positive		3.049	-0.065*
Mode of transmission (Ref: Unknown)			
Homosexual	-10.910	4.542	-0.070*
Unknown	3.413	1.116	0.103**
Suicidal History (Ref: No history)	-2.704	1.344	-0.061*
History of alcohol abuse (Ref: No history)	-4.168	1.429	-0.092**
Depression	-0.973	0.048	-0.672***

Only significant coefficients are included in this final model, S.E: Standard error, ***P<0.001, **P<0.01, *P<0.05

On the other hand, having primary education, being in nuclear family, having HIV-positive wife, having HIV-positive children, HIV infection through homosexual mode of transmission, history of suicidal attempts, and history of alcohol intake negatively predicted the QoL of life PLHIV. Depression was the strongest negative predictor of the QoL of PLHIV ($\beta = -0.672$, $P < 0.001$).

Depression and psychological correlates are the main predictors of QoL of PLHIV across the globe.[13,14] In this study also, the depression symptomatology was significantly associated with lower scores of QoL of PLHIV. A study conducted to assess the QoL of PLHIV in Georgia found that lower educational level significantly predicted the poor QoL.[15] In the present study also, having primary education negatively predicted the QoL and being graduated positively predicted the QoL.

Literature review by Basavaraj *et al*.[16] revealed that gender, young age, higher socioeconomic status, and employment were the positive predictors of the QoL in Indian PLHIV. Similar findings were observed in the present study where male gender was a significant positive predictor of the QoL of PLHIV.

Predictors of QoL in HIV/AIDS patients were assessed in a study from California, USA.[17] Results showed that depression and female gender were accounting for QoL of PLHIV. Similar findings were obtained in the present study also. An Irish cohort study showed that history of suicidal attempts, alcohol intake, and gender education were significantly associated with QoL of PLHIV in a multiple regression model.[18] These findings are consistent with the results of the present study also, where history of suicidal attempts and being alcoholic negatively predicted the QoL.

Family history of HIV/AIDS with HIV-positive wife, HIV-positive children, and getting infected with HIV infection through homosexual contact have been the negative predictors of QoL of PLHIV in the present study. Even a study conducted in Brazil[19] to assess the QoL and associated factors in PLHIV/AIDS showed the same results, where a homo-affective relationship, family history of HIV, having been stigmatized, and presence of psychosocial symptoms were the predictors associated with a poorer QoL.

Bivariate analysis done in the present study showed significant association with QoL but did not predicted QoL significantly when entered into multiple regression model. Occupation, marital status, area of residence, and WHO clinical staging showed associations with QoL but they did not predict QoL when entered into the multiple regression model. Similar observations were made in the study conducted among African American men.[20]

Increased emphasis on community-based care of people with HIV infection and AIDS is recommended by the National HIV/AIDS Strategy. Patients prefer to be treated within their community, and primary care reduces the demand on scarce, costly, and already overloaded hospital facilities. Thus, there is an increasingly large role for primary care physicians to play in the management of people infected with HIV.[21]

Primary care physicians have a role in the prevention of HIV infection in identifying asymptomatic seropositive people, in offering early therapeutic interventions, in the early detection of opportunistic infections and HIV-related malignancies, and in the ongoing management of chronic ill-health. There is also a role for primary care physicians in the psychosocial management of people with HIV/AIDS in supporting those close to the patient, and in educating the community in general about the social parameters of HIV/AIDS.[21]

Because depression is the strongest predictor of QoL of PLHIV/AIDS and access to psychiatric treatment is very less in India, primary care physicians should be trained for psychosocial management of PLHIV in India so that quality of life people living with HIV/AIDS will be enhanced.

Conclusions

QoL of PLHIV/AIDS has been affected by a number of variables: male gender, being graduated, not knowing the mode of transmission, having primary education, being in nuclear family, HIV-positive wife, HIV-positive children, homosexual mode of transmission, history of suicidal attempts, and history of being alcoholic when considered together. Efforts should be made for a comprehensive treatment of depression in PLHIV to enhance their QoL, especially by primary care providers.

Ethical consideration

The study was approved by the Institutional Ethical Clearance Committee and permission was taken from the Karnataka State AIDS Prevention Society, Bangalore. Informed consent was obtained from each participant.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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