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# Quality of life of people living with HIV/AIDS attending antiretroviral clinic in the center of excellence in HIV care in India

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## Abstract:

**INTRODUCTION:** HIV/AIDS is a serious challenge globally. A plethora of morbidities due to crippling immune system reduces quality of life (QOL). The advent of highly active antiretroviral treatment has changed this deadly disease to a chronic manageable illness with focus shifting from fighting virus to ensuring a good QOL.

**OBJECTIVE:** To assess the QOL among people living with HIV/AIDS (PLHA) and factors influencing, if any in Indian setting.

**MATERIALS AND METHODS:** An institutional-based cross-sectional study was carried out among 220 PLHA (male >15 years) attending Anti-Retroviral Therapy Centre of the center of excellence in HIV care in India (Calcutta School of Tropical Medicine, Kolkata) from May 2012 to April 2013. QOL was assessed using WHO-QOL-BREF questionnaire from January 2013 to December 2013. Statistical analysis was done using SPSS version 16; multivariate logistic regression was computed with adjusted odds ratio in 95% confidence interval;  $P < 0.05$  was considered statistically significant.

**RESULTS:** In this study, all 220 PLHA men participated (response rate 96.5%) where more than half (55.5%) participants rated their QOL as neither poor nor good; only 28.2% replied good. One-third (38.6%) were dissatisfied while only one-fifth (19.1%) satisfied and 41.4% mentioned neither satisfied nor dissatisfied with their health. Mean score  $\pm$  standard deviation on various domains and facets of WHOQOL-BREF were physical health score  $56.2 \pm 9.8$ , psychological health  $63.1 \pm 8.7$ , social relationship  $48.9 \pm 14.8$ , and environmental health  $51.3 \pm 13.7$ .

**CONCLUSION:** PLHA had good QOL on psychological, physical, and environmental domain that reflects better services provided at Calcutta School of Tropical Medicine (CSTM), Kolkata, but they scored poorly in social relationship domain, which may be suggestive of ineffective social services network. This study concludes that increase existing social and emotional support with innovation should be implemented to improve their QOL.

## Keywords:

Environmental health, India, male, personal satisfaction, quality of life, social work

## Introduction

HIV/AIDS is a serious challenge for developing as well as developed world. Globally, 34.0 million people were living with HIV at the end of 2011 and these individuals had deterioration in their quality of life (QOL).<sup>[1]</sup> In recent years, India

HIV estimation 2015–2016 Report elicited that the national adult (15–49 years) HIV prevalence was found 0.26% (0.22%–0.32%; male 0.30% and female 0.22%).<sup>[2]</sup>

People living with HIV/AIDS (PLHA) have to cope with a range of HIV-related symptoms (related to infection, comorbidities, or iatrogenic effects from

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HIV-related medications) for extended periods.<sup>[3,4]</sup> A plethora of morbidities due to crippling immune system reduce QOL, thereby impairing their physical, mental, and social well-being. Quality of life (QOL) is a multidimensional construct generally defined as a subjective evaluation of one's overall sense of well-being and includes aspects such as happiness and satisfaction with life as a whole.<sup>[5]</sup>

The advent of highly active antiretroviral treatment (HAART) has changed the concept of HIV/AIDS from a deadly disease to a chronic manageable illness with focus shifted from fighting the virus to ensuring a good QOL.<sup>[6-8]</sup> Still, their life is affected by various social factors such as poverty, depression, substance abuse, cultural practices, individual lifestyle and beliefs, and stigma/discrimination which affect their QOL; poorer QOL has been linked with increased mortality.<sup>[9-12]</sup>

Since India accounts for nearly half of the Asia's HIV prevalence, there is a definite need to measure QOL among PLHA and the factors influencing this in Indian setting, which would help to identify the most affected domain, and knowledge on influencing factors will aid in taking appropriate intervention as this gives a holistic picture of their health status.<sup>[13,14]</sup>

With the above backdrop, this study was conducted among PLHA (male aged >15 years), in Anti-Retroviral Therapy (ART) Centre of CSTM, Kolkata, to assess their QOL; the scientific findings gathered with regional and objective data will help in building an insight to improve their QOL.

## Materials and Methods

This epidemiological study was conducted among PLHA attending ART Centre, CSTM, Kolkata, for a period of 12 months from May 2012 to April 2013. CSTM, Kolkata, is the only institution in India exclusively dedicated to education, research, and healthcare of tropical and infectious diseases. The school started functioning independently in 1921, as Carmichael Hospital for Tropical Diseases. The institute possesses a center of excellence (COE) in HIV care where currently advance research is going on regarding HIV/HBV coinfection and hepatitis B antiviral therapy. Here, weekly meeting of State AIDS Clinical Expert Panel finalizes line of ART, home visit of patients on second-line ART for adherence and family counseling, nutritional counseling of all second-line and alternate first-line ART patients, and management of referral cases from ART centers of linked six states, namely Assam, Chhattisgarh, Jharkhand, Odisha, Sikkim, and West Bengal. This institute also provides operational research in HIV, mentoring of linked six states by Expert Panel Assess Number; training

of master trainers, medical officers, pharmacists, and CME in collaboration with the NACO.

The protocol of this study was approved by the Institutional Ethics Committee (IEC), All India Institute of Hygiene and Public Health, Kolkata, and was initiated once approved from the IEC.

All male (>15 years) PLHA newly registered in 2012–2013 at ART Centre and given consent to participate excluding those severely morbid to answer the schedule were included.

Target study population size was calculated with previous 3 years' average records of total male PLHA registered at CSTM, Kolkata ( $n = 620$ ), and taking 1/3<sup>rd</sup> of that (as 2 days in a week were allotted for field research work), the sample size came as 207. Further taking 10% nonresponse, this was 228; ultimately, 220 male (>15 years) living with HIV/AIDS responded (response rate 96.5%).

## Study tool instrument

Participants were interviewed using WHO-QOL-HIV (Field Trial Version) questionnaire to assess QOL,<sup>[15]</sup> which produces a profile with four domain scores and two individually scored items, rated on a 5-point Likert scale. As per the WHO guidelines, 25 raw scores for each domain was calculated by adding values of single items and then transformed to a score ranging from 0 to 100. Transformed score is required for comparing with other QOL study, as majority used WHO-QOL-100. The four domain scores were scaled in a positive direction with higher scores, indicating a higher QOL; three items of BREF were reversed before scoring (i.e., Q.3, Q.4, and Q.26). Score of each domain as well as overall (total) is considered good if score is >50% of the maximum attainable score, both domain-wise and in totality. The parameters taken in each domain are as follows: physical health, psychological health, social relationship, and environmental health. All the items were translated into Bengali keeping semantic equivalence, and Cronbach's alpha of the Bangla version came as 0.7 (acceptable).

## Data collection

Male (>15 years) PLHA after being attended by medical officer at ART Centre were interviewed in a separate room by the researchers, after taking informed written consent in local language (Bangla) and complete anonymity and confidentiality of each participant were ensured. Data on QOL and socio-demographic characteristics, i.e., age, education, family type, marital status, and income, were collected using pretested, predesigned semi-structured schedule.

## Statistical analysis

The collected data were entered in Microsoft Excel worksheet (Microsoft, Redwoods, WA, USA) and checked for accuracy, duplicate, or erroneous entry. Data were presented in tables, and categorical data were expressed in proportions while continuous data were expressed in mean  $\pm$  standard deviation (SD).

Multivariate logistic regression model was generated by keeping QOL as dichotomous categorical dependent variable – Good (Increase)/Poor (Decrease), considering all independent variables, irrespective of significant level in bivariate analysis. Adjusted odds ratio (OR) was computed along with 95% confidence interval (CI) from this logistic output;  $P < 0.05$  was considered statistically significant. All statistical analysis was done in SPSS software version 16.0 (Statistical Package for the Social Sciences Inc., Chicago, IL, USA).

## Results

In this study, among 220 PLHA men, maximum (40.5%) belong to the age group of 31–40 years followed by 24.1% in the age group of 41–50 years and least (0.9%) in  $>60$  years of age. Most of them were Hindu (80%), while 17.3% were Muslim; half were general (51.1%), while 22.2% were Scheduled caste among Hindus. Majority (28.6%) respondents studied up to secondary level, majority (26.4%) were unskilled worker by occupation, while 19.5% were unemployed. Majority were married (47.7%), while 31.8% unmarried. Maximum (79.5%) belong to nuclear family. Majority (44.5%) belonged to the upper lower social class and 30.5% in lower middle class as per the modified Prasad scale 2013.<sup>[16]</sup>

### Table 1: Overall quality of life and general health

More than half (55.5%) participants rated their QOL as neither poor nor good; only 28.2% replied good. One-third (38.6%) were dissatisfied and one-fifth (19.1%) satisfied, while 41.4% mentioned that they were neither satisfied nor dissatisfied with their health.

### Physical health domain

Most of the participants felt that physical pain prevented (43.6% and 46.4% moderate and very much, respectively) them doing what they need to do. Nearly half (49.1%) need any type of medical treatment to function in daily life though majority had enough energy (47.3% and 31.8% moderately and mostly, respectively). Fifty-two percent were able to get around on an average (neither poor nor good). Regarding sleep, 44.5% neither satisfied nor dissatisfied and 38.6% satisfied, respectively. Again, equal number (42.3%) replied neither satisfied nor dissatisfied and satisfied, respectively, with their ability to perform daily living

activities. Majority (46.8%) were satisfied and 41.4% neither satisfied nor dissatisfied with their capacity for work.

### Psychosocial health domain

Majority of the PLHA (46.8%) enjoyed their life very much. Nearly half of them (48.2% and 47.7%, respectively) found their life to be moderately meaningful and able to concentrate. Again, almost equal numbers (43%) of the PLWHA were able to accept their bodily appearance to moderate and very much. Nearly half (49.1%) were experiencing negative feelings such as blue mood, despair, anxiety, and depression very often.

### Social relationship domain

One-fourth (25%) were dissatisfied, whereas 39.5% and 30.5% were neither satisfied nor dissatisfied and satisfied, respectively, with their personal relationship. Higher dissatisfaction (29.1%) was found about their sex life though 39.1% and 23.2% were neither satisfied nor dissatisfied and satisfied, respectively. Majority (40.9%) were neither satisfied nor dissatisfied with social support from friends.

### Environmental health domain

Majority (44.1% each in moderately and very much, respectively) felt safe in their daily life; majority (47.3% and 33.2% moderately and very much, respectively) said their physical environment as healthy, but one-fifth (18.2%) said a little. Nearly half (48.6%) had no enough money, while 41.8% had moderate amount. Half of them (50.5%) had a little, while 42.3% a moderate amount of daily information. Half (45%) had moderate opportunities for leisure activities, while 25% had a little scope.

One-fourth of them (25.5%) were dissatisfied while 41.4% neither satisfied nor dissatisfied and 30.6% was satisfied with condition of living place. Nearly half (46.8%) were neither satisfied nor dissatisfied with their access to health services, while one-fifth (21.4%) were dissatisfied; nearly a fourth (23.2%) being dissatisfied, while a large number (37.3%) were satisfied with their transport.

Table 2 shows that mean scores in all domains of QOL were maximum for the environment domain ( $23.9 \pm 4.1$ ) followed by physical domain ( $22.6 \pm 2.6$ ), psychological domain ( $21.1 \pm 2.0$ ), and social relationship ( $8.9 \pm 1.7$ ) in descending order.

Mean score  $\pm$  SD of the patients on various domains and facets of WHO-QOL-BREF were physical health score  $56.2 \pm 9.8$ , psychological health  $63.1 \pm 8.7$ , social relationship  $48.9 \pm 14.8$ , and environmental health  $51.3 \pm 13.7$ . The highest median score was observed in the psychological health domain, i.e., 63 with interquartile

**Table 1: Frequency distribution of the each item as per domain of WHO-quality of life BREF: (n=220)**

Domains and questions	Score, n (%)				
	1	2	3	4	5
<b>Overall quality of life and general health</b>					
<b>Domains and questions</b>	<b>Very poor</b>	<b>Poor</b>	<b>Neither poor nor good</b>	<b>Good</b>	<b>Very good</b>
Q1 How would you rate your quality of life?	0	34 (15.5)	122 (55.5)	62 (28.2)	2 (0.9)
<b>Domains and questions</b>	<b>Very dissatisfied</b>	<b>Dissatisfied</b>	<b>Neither satisfied nor dissatisfied</b>	<b>Satisfied</b>	<b>Very satisfied</b>
Q2 How satisfied are you with your health?	2 (0.9)	81 (36.8)	91 (41.4)	42 (19.1)	4 (1.8)
<b>Physical health domain</b>					
<b>Domains and questions</b>	<b>Not at all</b>	<b>A little</b>	<b>A moderate amount</b>	<b>Very much</b>	<b>An extreme amount</b>
Q3 To what extent do you feel that physical pain prevents you from doing what you need to do?	0	22 (10)	96 (43.6)	102 (46.4)	0
Q4 How much do you need any medical treatment to function in your daily life?	0	47 (21.4)	108 (49.1)	65 (29.5)	0
<b>Domains and questions</b>	<b>Not at all</b>	<b>A little</b>	<b>Moderately</b>	<b>Mostly</b>	<b>Completely</b>
Q10 Do you have enough energy for everyday life?	0	45 (20.5)	104 (47.3)	70 (31.8)	1 (0.5)
<b>Domains and questions</b>	<b>Very poor</b>	<b>Poor</b>	<b>Neither poor nor good</b>	<b>Good</b>	<b>Very good</b>
Q15 How well are you able to get around?	0	32 (14.5)	115 (52.3)	72 (32.7)	1 (0.5)
<b>Domains and questions</b>	<b>Very dissatisfied</b>	<b>Dissatisfied</b>	<b>Neither satisfied nor dissatisfied</b>	<b>Satisfied</b>	<b>Very satisfied</b>
Q16 How satisfied are you with your sleep?	0	36 (16.4)	98 (44.5)	85 (38.6)	1 (0.5)
Q17 How satisfied are you with your ability to perform your daily living activities?	0	34 (15.5)	93 (42.3)	93 (42.3)	0
Q18 How satisfied are you with your capacity for work?	0	25 (11.4)	91 (41.4)	103 (46.8)	1 (0.5)
<b>Psychological health domain</b>					
<b>Domains and questions</b>	<b>Not at all</b>	<b>A little</b>	<b>A moderate amount</b>	<b>Very much</b>	<b>An extreme amount</b>
Q5 How much do you enjoy life?	0	10 (4.5)	93 (42.3)	103 (46.8)	14 (6.4)
Q6 To what extent do you feel your life to be meaningful?	0	13 (5.9)	106 (48.2)	92 (41.8)	9 (4.1)
Q7 How well are you able to concentrate?	1 (0.5)	14 (6.4)	91 (41.4)	105 (47.7)	9 (4.1)
Q11 Are you able to accept your bodily appearance?	0	11 (5)	96 (43.6)	95 (43.2)	18 (8.2)
<b>Domains and questions</b>	<b>Very dissatisfied</b>	<b>Dissatisfied</b>	<b>Neither satisfied nor dissatisfied</b>	<b>Satisfied</b>	<b>Very satisfied</b>
Q19 How satisfied are you with yourself?	0	11 (5)	95 (43.2)	96 (43.6)	18 (8.2)
<b>Domains and questions</b>	<b>Never</b>	<b>Seldom</b>	<b>Quite often</b>	<b>Very often</b>	<b>Always</b>
Q26 How often do you have negative feelings such as blue mood, despair, anxiety, depression?	0	14 (6.4)	84 (38.2)	108 (49.1)	14 (6.4)
<b>Social relationships domain</b>					
<b>Domains and questions</b>	<b>Very dissatisfied</b>	<b>Dissatisfied</b>	<b>Neither satisfied nor dissatisfied</b>	<b>Satisfied</b>	<b>Very Satisfied</b>
Q20 How satisfied are you with your personal relationships?	5 (2.3)	55 (25)	87 (39.5)	67 (30.5)	6 (2.7)
Q21 How satisfied are you with your sex life?	16 (7.3)	64 (29.1)	86 (39.1)	51 (23.2)	3 (1.4)
Q22 How satisfied are with the support you get from your friends?	13 (5.9)	52 (23.6)	90 (40.9)	62 (28.2)	3 (1.4)
<b>Environmental domain</b>					
<b>Domains and questions</b>	<b>Not at all</b>	<b>A little</b>	<b>A moderate amount</b>	<b>Very much</b>	<b>Extremely</b>
Q8 How safe do you feel in your daily life?	0	19 (8.6)	97 (44.1)	97 (44.1)	7 (3.1)
Q9 How healthy is your physical environment?	0	40 (18.2)	104 (47.3)	73 (33.2)	3 (1.4)
<b>Domains and questions</b>	<b>Not at all</b>	<b>A little</b>	<b>Moderately</b>	<b>Mostly</b>	<b>Completely</b>
Q12 Have you enough money to meet your needs?	10 (4.5)	107 (48.6)	92 (41.8)	11 (5)	0
Q13 How available to you is the information that you need in your daily-to-day life?	6 (2.7)	111 (50.5)	93 (42.3)	10 (4.5)	0

Contd...



**Table 1: Contd...**

Domains and questions	Score, n (%)				
	1	2	3	4	5
<b>Environmental domain</b>					
Q14 To what extent do you have the opportunity for leisure activities?	0	55 (25.0)	99 (45.0)	64 (29.1)	2 (0.9)
Domains and questions	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
Q23 How satisfied are you with the condition of your living place?	2 (0.9)	56 (25.5)	91 (41.4)	70 (30.6)	1 (0.4)
Q24 How satisfied are you with your access to health services?	0	47 (21.4)	103 (46.8)	68 (30.9)	2 (0.9)
Q25 How satisfied are you with your transport?	0	51 (23.2)	84 (38.2)	82 (37.3)	3 (1.4)

**Table 2: Mean raw score in the domains of WHO quality of life-BREF: (n=220)**

Domains	Attainable raw score		Attained raw score		Mean (SD)
	Minimum	Maximum	Minimum	Maximum	
Physical health	7	35	18	29	22.60 (2.63)
Psychological health	6	30	17	26	21.12 (2.02)
Social relationship	3	15	6	12	8.86 (1.73)
Environmental health	8	40	15	30	23.93 (4.15)

SD=Standard deviation

range 56–69, and lowest in social relationship domain, i.e., 50 with interquartile range 44–56 [Table 3].

Table 4 shows that in the present study, an attempt has been made to find out the association between overall QOL and some variables by bivariate logistic regression analysis followed by multivariate logistic regression analysis. It was observed in bivariate analysis that with a decrease in age ( $\leq 40$  years) of a PLHA (OR = 0.98 [0.57–1.70]), education up to secondary level (OR = 0.95 [0.51–1.79]), married (OR = 0.99 [0.59–1.67]), and having social stigma (OR = 0.78 [0.46–1.32]), the overall QOL decreased whereas PLHA from nuclear type of family (OR = 1.416 [0.73–2.74]), and lower percutaneous coronary intervention (PCI) (OR = 1.65 [0.83–3.30]), the overall QOL increased but not found significant statistically ( $P > 0.05$ ).

Multivariate logistic regression analysis after adjustment found increased overall QOL among lower age ( $\leq 40$  years) of PLHA (OR = 1.01 [0.58–1.77]), married (OR = 1.16 [0.67–2.01]), lower PCI (OR = 2.08 [0.90–4.79]), and having social stigma (OR = 1.06 [0.60–1.89]), whereas PLHA having education up to secondary level (OR = 0.72 [0.33–1.53]) and from nuclear type of family (OR = 0.69 [0.35–1.36]) overall QOL decreased; they still could not establish any significant association overall OQL with these variables ( $P > 0.05$ ).

## Discussion

HIV is increasingly considered a chronic disease; a plethora of morbidities which emerges among PLHA

due to crippling of the immune system reduce QOL, thereby impairing their physical, mental, and social well-being.

In this present study, among 220 PLHA, majority (40.5%) belong to 31–40 years followed by 24.1% in 41–50 years; similarly, almost half aged below 41 years found elsewhere.<sup>[17-19]</sup> Maximum (89.92%) were male in some literature,<sup>[8,20,21]</sup> whereas female predominance found elsewhere.<sup>[17,22]</sup> In our study, 94.1% literate and 28.6% respondents studied up to secondary level, only 15.9% HS passed, consistent with findings elsewhere;<sup>[7,8,21,22]</sup> around half completed middle school, Grade IX, and above.<sup>[17,20]</sup>

In this study, nearly half were married (47.7%), 31.8% unmarried, consistent with the findings in Lucknow and Nepal;<sup>[8,22]</sup> less than half were married in other settings<sup>[17,20,21]</sup> whereas more (65.9%) married and only 8.8% unmarried (all male) in Haryana.<sup>[19]</sup> Rajeev *et al.* found that 11.3% PLHAs on ART and 7.3% not on ART were unmarried, about 23% in both groups were widowed.<sup>[7]</sup> In the present study, maximum (79.5%) belong to nuclear family. Lulseged found that 29.4% had family size  $\leq 2$ , 70.6% had family size 3+; 19.1% were living alone, while 80.9% lived with family/relatives.<sup>[17]</sup>

In the present study, 44.5% belong to the upper-lower social class and 30.5% in lower-middle class; however, the mean income was less (Rs. 2750/-) than previous study.<sup>[7,18]</sup> In China and Brazil, majority were from low socioeconomic class.<sup>[20,21]</sup>

**Table 3: Descriptive statistics of domain wise transformed score (0-100) of WHO quality of life-BREF: (n=220)**

Domains	Attained transformed score		Mean (SD)	Median (IQR)
	Minimum	Maximum		
Physical health	38	81	56.16 (9.76)	56 (50-63)
Psychological health	44	81	63.08 (8.69)	63 (56-69)
Social relationship	25	75	48.93 (14.78)	50 (44-56)
Environmental health	25	69	51.34 (13.74)	56 (38-63)

SD=Standard deviation, IQR=Interquartile range

**Table 4: Bivariate and multivariate regression model explaining quality of life (overall) of people living with HIV/AIDS (n=220)**

Variables	Coding	OR (95% CI)	AOR (95% CI)
Age (years)	≤40	0.98 (0.57-1.70)	1.01 (0.58-1.77)
	>40	1	1
Educational status	Up to secondary level	0.95 (0.51-1.79)	0.72 (0.33-1.53)
	HS and above	1	1
Marital status	Married	0.99 (0.59-1.67)	1.16 (0.67-2.01)
	Unmarried	1	1
Family type	Nuclear	1.416 (0.73-2.74)	0.69 (0.35-1.36)
	Joint	1	1
PCI	≤Rs. 1949/-	1.65 (0.83-3.30)	2.08 (0.90-4.79)
	>Rs. 1949/-	1	1
Social stigma	Yes	0.78 (0.46-1.32)	1.06 (0.60-1.89)
	No	1	1

CI=Confidence interval, OR=Odds ratio; AOR=Adjusted OR, PCI=Percutaneous coronary intervention

Maximum participants faced more than one physical ailment. This present study findings under each item of psychosocial health and social relationship domain were similar to the findings of Surya Abraham in Mangalore.<sup>[18]</sup>

Our study showed that psychological domain ( $63.1 \pm 8.7$ ) achieved the highest mean score followed by physical health ( $56.2 \pm 9.8$ ) in 0–100 scale, which is in conformity with previous literature.<sup>[7,8,12]</sup> The better score in psychological domain might be due to the better services provided at the ART Centre of CSTM, Kolkata, which is one of the certified COE in HIV care in India. In China, average scores of physical component summary (PCS) and mental component summary (MCS), with total score (TS), were  $66.8 \pm 21.9$  (mean 6 SD),  $62.2 \pm 20.9$ , and  $64.5 \pm 20.2$ .<sup>[20]</sup> The lowest score was seen in psychological domain in Haryana and Nepal.<sup>[19,22]</sup> Median domain-wise scores of QOL of the participants were 69 (25) in physical domain; 56 (19) in psychological domain; 56 (31) in social domain; and 63 (19) in environmental domain.

Lulseged found education as the only predictor of physical and mental health summary scoring

in PLWHA on HAART and their neighbors.<sup>[17]</sup> Rao *et al.* found that men reported better physical and functional well-being ( $P < 0.001$ ). Participants who lived with others, or white and had a lower CD4+ T-count, reported better emotional and social well-being ( $P < 0.001$ ).<sup>[23]</sup>

Both univariate and multivariate models did not show any significant result in the present study owing to the fact that study population were homogenous as all of them were newly registered at ART Centre, similar to Shukla *et al.* in Lucknow.<sup>[8]</sup> Male had high mean QOL scores in I, II, V, and VI domain; while female, illiterate, divorced/separated, unemployed, income <Rs. 1500/-, on ART, CD4 count <200/cumm had low mean QOL scores.<sup>[7]</sup> Duration since HIV diagnosis, ART status, and CD4 count which are the important determinants of QOL, as depicted in other studies, were not taken into account in the present study. Acharya found that age >35 years, male, and unmarried were significantly associated with overall QOL whereas education HS and above, CD4 counts and WHO clinical stage had no significant association with overall QOL.<sup>[22]</sup> Sun *et al.* showed that PCS, MCS, and TS were significantly associated with monthly income, perceived social support, ART, condom use, transmission, and ethnicity.<sup>[20]</sup>

The present study found increased overall QOL among lower age ( $\leq 40$  years) of PLHA (OR = 1.01 [0.58–1.77]) and married (OR = 1.16 [0.67–2.01]), in Haryana; the mean scores of physical domain ( $53.00 \pm 8.023$ ) were maximum for younger patients (15–24 years); and the mean scores of psychological domain ( $50.62 \pm 11.995$ ) were maximum ( $P = 0.007$ ) for married.<sup>[19]</sup> Medeiros *et al.* found that among socioeconomic variables, associations between age and the domains of health concerns, concerns about medication, and acceptance of HIV predominated.<sup>[21]</sup>

### Strength

This research study conducted in the COE in India in HIV care (CSTM, Kolkata) showed quite high response (96.5%) among participants, which might be due to good service for PLHA as perceived by them.

### Limitation

One-fourth of the participants had primary level education, which made eliciting WHO-QOL BREF questionnaire (Bengali version, 5 point Likert scale) a bit questionable, owing to their cognitive judgment ability to differentiate fine nuances of variation in answer options; this would be attenuated as a consequence of their poor education. Although all diagnosed male PLHA registered at ART Centre, CSTM, Kolkata, were considered as study population, their duration of diagnosis and CD4 count

or disease stage which was an important determinant of their QOL were not reported.

## Conclusion

PLHA had good QOL on psychological, physical, and environmental domain reflective of better services provided at the ART Centre, CSTM, Kolkata, but they scored poorly in social relationship domain. Poor social domain might be suggestive of ineffective social services network, because PLHA are still exposed to stigmatization/discrimination. Data on follow-up visits may give more information needed for their comprehensive care. Improving QOL will create a better home environment benefiting family, even benefit to community and organizations working for PLHA. This study concludes that efforts must be directed to increase social and emotional support perceived by PLHAs with implementation of newer innovative supporting policy to improve their QOL.

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## Author contributions

TS<sup>1</sup>- Concept and design of study, Data Collection, Data analysis and interpretation of data, manuscript writing, final approval of the version to be published. NK<sup>2</sup>- Concept and design of study, Data collection, Data analysis and interpretation of data, manuscript writing, critical revision of the manuscript for important intellectual content, final approval of the version to be published. AD<sup>3</sup>- Concept of study, critical revision of the manuscript for important intellectual content, final approval of the version to be published. BS<sup>4</sup>- Supervision of the study and final approval of the version to be published.

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## Conflicts of interest

There are no conflicts of interest.

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