

# Assessment of Quality of Life of People Living With HIV/AIDS In Karnataka State

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**Abstract:-** HIV not only affects the physical well being of an individual but also the overall Quality of life (QOL) . The assessment of QOL is more important to understanding how the people's lives are affected by HIV infection. It helps to evaluate the financial costs, benefits of new programmes to health care providers and policymakers. The objective of present study is to determine the impact of human Immunodeficiency Virus (HIV) and HAART treatment on PLHIV. A total of 800 HIV positive patients above 18 years of age adults, who are on HA ART and newly enrolled for HIV care in different ART centers of Bangalore city were recruited after obtaining informed consent .ART and pre ART eligible patients were interviewed at different intervals by using WHO-brief scale. Each client participated in three in-depth interviews (IID's). QOL-assessment was done across a range of different socioeconomic, physical, psychological and clinical parameters. Factorial and principle component methods were employed to find out the significant difference between the various QOL domains. The mean age of the male and female patients was 32.14±6.30 and 32.50±6.23 years respectively. The overall mean score on a scale of 0-100 was found to be 19.50 in pre ART, and one year after completion of HAART, the mean score was 119.20. A statistically significant QOL scores between psychological, physical and social relation domain is compared with educational status ( $P \leq 0.05$ ). The present study is to quantify QOL –with regard to educational status, family income, occupation, family support, immunological and clinical factors. HAART treatment, educational status, and also good social relationships can improve the QOL. The living environment of PLHIVS is one of the most important determinants of overall QOL, it has been suggested that QOL may be uniquely affected by specific disease process such as AIDS. Factorial analysis and principle component- user friendly model is helpful for physicians, researchers and policymakers for taking clinical decisions and for implementation of new programmes.

**Keywords:-** HAART, QOL, AIDS, HIV, PLHIV, WHO.ART

## INTRODUCTION

Quality of life (QOL) is a term that is popularly used to convey an overall sense of well-being and includes aspects such as happiness and satisfaction with life as a whole. World Health Organization has defined QOL as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, standards, expectations and concerns." [1] With the recent advances in clinical tests and treatments for those suffering from human immunodeficiency virus (HIV) /acquired immunodeficiency syndrome (AIDS), the survival of these patients has been increased and their QOL has become an important focus for researchers and healthcare providers. [2] Since the discovery of HIV at in beginning of the 1980s, HIV/AIDS has been one of the greatest health problems in the world. [3] HIV/AIDS places an increasing burden on the health of the population, and causes further socioeconomic problems for individuals, families, communities, NGO's and governments in many countries. [4],[5] HIV is increasingly considered a chronic disease. For a person living with HIV, this means having to cope up with a range of HIV-related symptoms for entire life . Symptoms may be related to the infection itself, co morbid illnesses or iatrogenic effects from HIV-related medications. [6],[7] Many of the HIV patients struggle with numerous social problems such as stigma, discrimination, poverty, depression, substance abuse, and cultural beliefs which can affect their QOL not only from the physical health aspect, but also from the mental and social health point of view and causes numerous problems. [8] Assessing health-related quality of life (HRQOL) is useful for documenting the patients' perceived burden of chronic disease, tracking changes in health over time, assessing the effects of treatment and quantifying the return on health care investment. In the context of present study, the aim is to find out the association between different aspects of QOL in PLHIV.

## EQUATION:

The patients were recruited for the QOL study with written consent; WHO QOL-BREF instrument has 26 items grouped under four domains. The items under the domains are: Physical health - dependence of treatment, energy and fatigue, mobility, presence of pain and discomfort, sleep and rest, activities of daily living, and perceived working capacity.

- 1 *Psychological well-being:* Positive self-concept, negative feelings, higher cognitive functions, body image, and spirituality Social relations - social contacts, family support, sexual activity.
- 2 *Environment:* freedom, quality of home environment, physical safety and security, involvement in recreational activity, quality of health and social care, and accessibility to services.
- 3 *Physical:*
- 4 *Social relationship:*

There are also two items examined separately. One about the individual's overall perception of QOL and the other about the individual's overall perception of his or her health. Each item uses a five –point Likert –type scale. All 26 items were checked and scores ranging from 1-5 were assigned. Scores of three negatively phrased items were reversed. Scores were transformed to 0-100 scale using of WHO QOL-BREF instrument. Cases with greater than 15 % of missing data were deleted and the data set were saved. Collected data were analyzed by using SPSS-16.50 version; Factorial and Univariate analysis were employed to find out the correlation between different HRQOL domains, Chrobanch "α" value was used for testing the hypothesis. The following factors were pooled and calculated on transformed scale

Transformed scale = (Actual score - Lowest possible raw score/Possible score) \* 100

$F_1$  (Domain 1) =Physical health.  
 $F_2$  (Domain 2) =Psychological.  
 $F_3$  (Domain 3) =Social relationship/level of independence.  
 $F_4$  (Domain 4) = Environment.

### MODEL FORMULATION:

$$x_1 = \lambda_1 F_1 + e_1 \quad x_1 = \lambda_1 F_2 + e_1 \quad x_1 = \lambda_1 F_3 + e_1 \quad x_1 = \lambda_1 F_4 + e_1$$

$$x_2 = \lambda_2 F_1 + e_2 \quad x_2 = \lambda_2 F_2 + e_2 \quad x_2 = \lambda_2 F_3 + e_2 \quad x_2 = \lambda_2 F_4 + e_2$$

$$x_3 = \lambda_3 F_1 + e_3 \quad x_3 = \lambda_3 F_2 + e_3 \quad x_3 = \lambda_3 F_3 + e_3 \quad x_3 = \lambda_3 F_4 + e_3$$

$$x_4 = \lambda_4 F_1 + e_4 \quad x_4 = \lambda_4 F_2 + e_4 \quad x_4 = \lambda_4 F_3 + e_4 \quad x_4 = \lambda_4 F_4 + e_4$$

$$x_5 = \lambda_5 F_1 + e_5 \quad x_5 = \lambda_5 F_2 + e_5 \quad x_5 = \lambda_5 F_3 + e_5 \quad x_5 = \lambda_5 F_4 + e_5$$

$$x_6 = \lambda_6 F_1 + e_6 \quad x_6 = \lambda_6 F_2 + e_6 \quad x_6 = \lambda_6 F_3 + e_6 \quad x_6 = \lambda_6 F_4 + e_6$$

$$x_7 = \lambda_7 F_1 + e_7 \quad x_7 = \lambda_7 F_2 + e_7 \quad x_7 = \lambda_7 F_3 + e_7 \quad x_7 = \lambda_7 F_4 + e_7$$

$$x_8 = \lambda_8 F_1 + e_8 \quad x_8 = \lambda_8 F_2 + e_8 \quad x_8 = \lambda_8 F_3 + e_8 \quad x_8 = \lambda_8 F_4 + e_8$$

$$x_9 = \lambda_9 F_1 + e_9 \quad x_9 = \lambda_9 F_2 + e_9 \quad x_9 = \lambda_9 F_3 + e_9 \quad x_9 = \lambda_9 F_4 + e_9$$

$$x_{10} = \lambda_{10} F_1 + e_{10} \quad x_{10} = \lambda_{10} F_2 + e_{10} \quad x_{10} = \lambda_{10} F_3 + e_{10} \quad x_{10} = \lambda_{10} F_4 + e_{10}$$

### X1: Age

**X2: How would you rate your quality of life?**

**X3: How satisfied are you with your health?**

**X4: How satisfied are you with your capacity for work?**

**X5: How often do you have negative feelings such as blue mood?**

**Despair, anxiety, depression?**

**X6: How satisfied are with the support you get from your friends?**

**X7: How satisfied are you with your sex life?**

**X8: How satisfied are you with your personal relationships?**

**X9::How much do you enjoy life?**

$r(e_i, e_j) = 0$  for  $i \neq j$  for all pairs of  $i$  and  $j$ . The coefficient  $\lambda_i$  which is regression coefficient, and termed as factor loadings. A unique factor  $F_1, F_2, F_3, F_4$  is called common factors. The residuals  $e_i$ 's are called unique factors. Unique factors regarded as a sum of an error of measurement. From the matrix factor loadings, if  $\lambda_i = 0$  then the  $i^{\text{th}}$  factor does not enter in to the account of  $i^{\text{th}}$  variable. In order to reduce the number of factors and hence to enhance the interpretability, factors are rotated by techniques like varimax rotation. Geometrically, rotation means the tilting of factors on their axis in one direction or another until certain variables appear to their effect. This increases the quality of interpretation of the factors. The varimax rotation procedure attempts to maximize the sum of the variance of squared factor loadings in the columns of the loading matrix and, in the process it tends to produce some high loadings and non zero loadings on each factors. In these techniques, the sum of squared loading of each row of the factor loading matrix remains intact, while the newest of orthogonal factor is obtained. In view of the strong correlation among certain factors of variables, factors analysis was carried out to see these variables

which can be grouped in to certain factors that may explain the interrelation ship amongst a large number of variables of PLHIV."Communalities" is a measure of the amount of variables- variance that is explained by the extracted factors and is obtained by adding the square of factor loading of the ten factors. The higher the variable Communalities, the more are the common factors explained by single factors. As all the variables have higher factor loading in case of factor  $F_1$ , it means that all variables are grouped together into single factor.

### Principle component analysis:

ARV treatment information, details of age sex, education, occupation ,cd4 count and risk bearing set of data, with measurement of ten variables  $X_1, X_2, \dots, X_K$  for each set of new variables ( $P_i$ ) called principle components, which are linear combination of the  $X$ 's was obtained for analysis.

**TABLE AND FIGURES****Tab (1):** Distribution of HIV patients according to their socioeconomic and psychological characteristics.

(N=800)

Characteristics	No. of HIV clients	Percentage (%)	Odd ratio	95% Confidence interval(CI)	P-Value
<b>I. Gender</b>					
Male	465	58.12	1.04	0.59-0.89	0.88
Female	330	41.25	0.98	0.35-0.62	0.75
Trans gender(TS/TG)	05	0.625	0.021	0.03-0.011	0.21
<b>II. Age</b>					
<20	72	9	3.56	0.321-0.856	0.21
21-30	418	52.25	21.23	0.66-0.963	0.63
31-40	225	28.125	10.50	0.423-0.658	0.42
41 & Above	85	10.625	8.65	0.302-0.756	0.63
Pool	800	100	10.99		0.47
<b>Education</b>					
Illiterate	425	53.125	38.25	0.248-0.583	0.213
Literate	375	46.875	23.62	0.413-0.261	0.33
	800	50	30.935		0.2715
<b>Occupation</b>					
Agriculture	102	12.75	21.32	0.45-0.698	0.421
Agriculture and allied	40	5	10.26	0.789-0.211	0.365
House wife	45	5.625	5.12	0.563-0.745	0.111
Commercial sex workers	50	6.25	2.35	0.321-0.874	0.241
Vendor	55	6.875	4.52	0.444-0.99	0.32
Skilled worker	30	3.75	3.65	0.211-0.365	0.412
Asst worker	45	5.625	4.21	0.453-0.869	0.605
Salaried class	42	5.25	3.89	0.486-0.756	0.452
Business man	76	9.5	4.01	0.11-0.201	0.324
Drivers	315	39.375	10.24	0.453-0.698	0.485
	800	100	6.957		0.376
<b>Income</b>					
High income	89	11.125	2.36	2.48-6.56	0.89
Medium income	148	18.5	5.48	5.36-6.23	0.145
Low income	563	70.375	2.96	1.24-2.48	0.231
	800	100	3.6		0.422
<b>Religion</b>					
Hindu	655	81.875	4.21	0.112-0.856	0.458
Muslims	102	12.75	10.56	0.236-0.78	0.023
Christians	43	5.375	0.65	0.24-0.63	0.0112
	800	100	5.14		0.164
<b>Type of family</b>					
Nuclear	440	55	6.52	2.36-4.56	0.523
Joint	231	28.875	10.45	1.28-6.30	0.889
Staying alone	129	16.125	3.98	1.41-2.45	0.365
	800	100	6.98		0.632
<b>Marital status</b>					
Married	401	50.125	3.88	1.23-3.56	0.54
Divorce	274	34.25	15.23	4.58-8.96	0.113

Separated	125	15.625	2.89	3.86-7.85	0.53
	800	100	7.33		0.39
<b>Age at first sex and inter course</b>					
>18 Years	563	70.375	5.36	0.398-0.635	2.36
<18 Years	237	29.625	8.59	0.745-0.522	5.89
	800	100	6.975		4.125
<b>Life time sex partners</b>					
One partner	158	19.75	3.78	0.231-0.765	0.36
Two partners	475	59.375	8.59	0.234-0.635	0.012
Three partners	102	12.75	6.39	0.211-0.386	0.242
>three partners	44	5.5	3.22	0.369-0.521	0.069
Non responders	21	2.625	4.52	0.112-0.23	0.542
	800	100	5.3		0.245
<b>Type of sex</b>					
<b>Anal sex</b>					
Yes	35	4.375	10.25	0.638-0.987	0.234
No	87	10.875	8.96	0.124-0.635	0.458
Non responders	678	84.75	5.47	0.489-0.963	0.635
	800	100	8.22		0.44
<b>Oral sex</b>					
Yes	82	10.25	6.58	0.218-0.659	0.478
No	45	5.625	2.49	0.487-0.635	0.698
Non responders	673	84.125	2.31	0.89-0.214	0.478
	800	100	3.79		0.55
<b>Vaginal sex</b>					
Yes	735	91.875	1.26	2.31	0.0236
No	28	3.5	2.36	8.56	0.123
Non responders	25	3.125	0.48	4.12	0.235
Homosexual	12	1.5	0.24	2.36	0.412
	800	100	1.08		0.19
<b>Seropositive Status</b>					
One family member	498	62.25	2.36	2.36-5.23	0.214
Two family members	269	33.625	4.89	1.48-6.98	0.458
Three family members	23	2.875	6.58	2.89-3.98	0.748
>three family members	10	1.25	1.48	3.28-6.89	0.352
	800	100	3.82		0.443

Tab (2): Total scores of different domains Of QOL (Transformed scale)

SL.	Domains	N	QOL-Before ART treatment				QOL -after one year ART treatment			
			Min	Max	Mean	SD	Min	Max	Mean	SD
01.	Domain1=Physical health	800	19.5	65.10	58.10	102.1	42.16	146.23	119.20	30.20
02.	Domain2 =Psychological	800	21.5	44.28	32.08	66.03	52.08	108.92	83.16	17.62
03.	Domain3=Social relationship/level of independence	800	14.6	40.01	18.15	59.32	36.00	96.22	65.10	38.16
04.	Domain4 = Environment	800	10.38	32.04	13.11	98.16	21.56	85.63	50.02	40.65

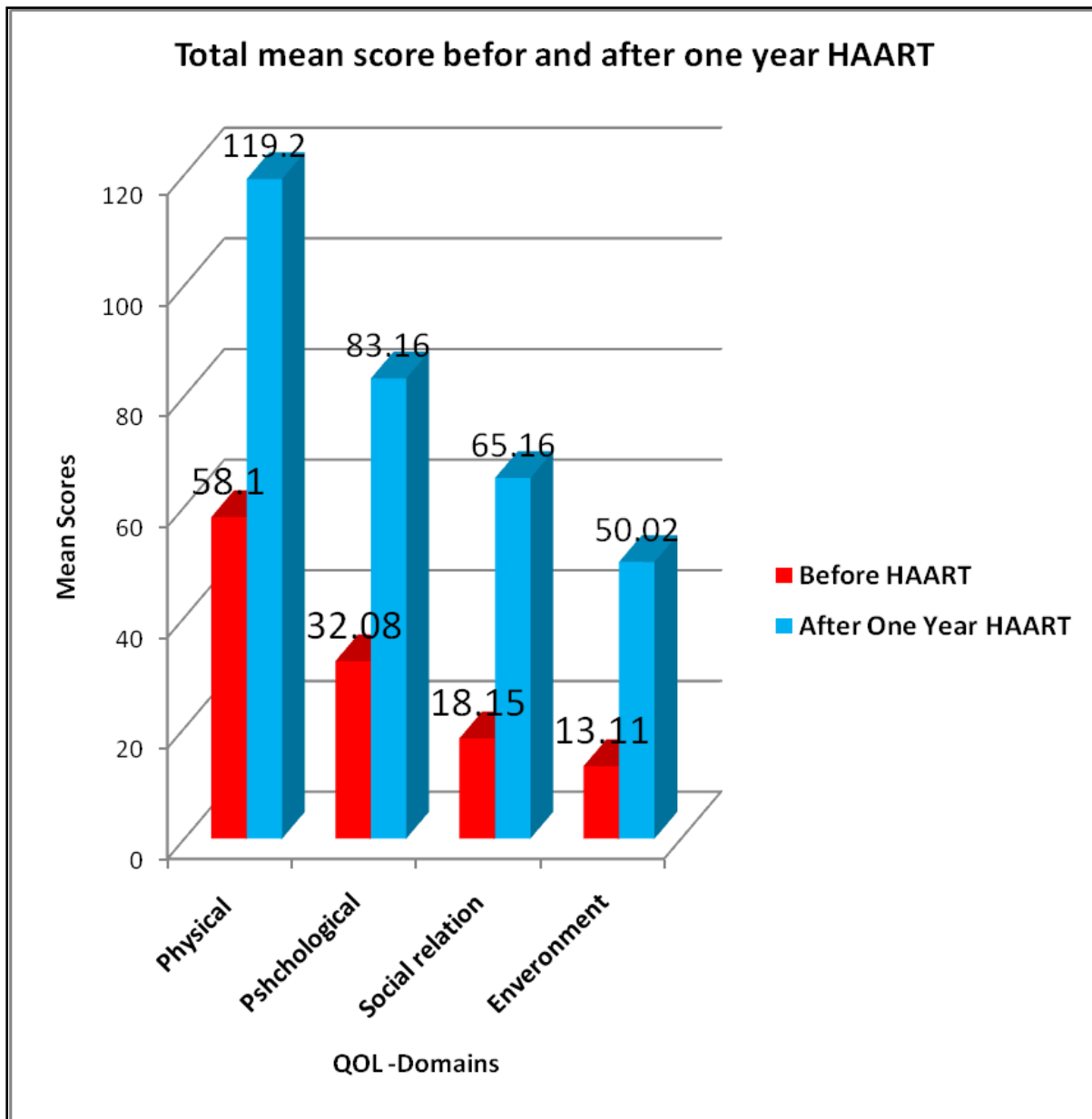


Fig (1): Mean scores of QOL

Tab (2): correlation matrix of categorical variables of PLHIV

(N=800)

Categorical variables	Age (X1)	(X2)	(X3)	(X4)	(X5)	(X6)	(X7)	(X8)	(X9)
Age(X1)	1.00	0.760**	0.630*	0.252	0.321	0.124	0.859**	0.902**	0.316
(X2)		1.00	0.465	0.118	0.289	0.435*	0.769**	0.834**	0.341
(X3)			1.00	0.218	0.411	0.632*	0.698**	0.635*	0.540*
(X4)				1.00	0.136	0.369	0.782*	0.617*	0.428
(X5)					1.00	0.248	0.399	0.872*	0.501*
(X6)						1.00	0.589*	0.487	0.214
(X7)							1.00	0.888*	0.324
(X8)								1.00	0.142
(X9)									1.00

\*, \*\* Significant at 0.05&0.01 level

X1: Age

X2: How would you rate your quality of life?

X3: How satisfied are you with your health?

X4: How satisfied are you with your capacity for work?

X5: How often do you have negative feelings such as blue mood, Despair, anxiety, depression?

X6: How satisfied are with the support you get from your friends?

X7: How satisfied are you with your sex life?

X8: How satisfied are you with your personal relationships?

X9::How much do you enjoy life?

**Tab (3):** Strong correlation of categorical variables of HIV patients.

Categorical variables	Strong correlation
Age(X1)	X2,X3,X7,X8,X9
How would you rate your quality of life? (X2)	X6,X7,X8,
How satisfied are you with your health? (X3)	X6,X7X8,X9
How satisfied are you with your capacity for work (X4)	X7,X8
How often do you have negative feelings such as blue mood, Despair, anxiety, depression? (X5)	X8,X9
How satisfied are with the support you get from your friends? (X6)	X1,X2,X3,X4 &X7
How satisfied are you with your sex life? (X7)	X1,X2,X3,X4 &X8
How satisfied are you with your personal relationships (X7)	(X2) (X3) (X7) (X8) (X9)
How much do you enjoy life? (X8)	X1,X3,X5

**Tab (4):** Associated parameters in PLHIV.  
(N=800)

Categorical variables	Factors				Communalities
	F1	F2	F3	F4	
X1: Age	0.64	-0.44	0.36	0.03	0.858
X2: How would you rate your quality of life?	0.75	-0.12	0.14	0.07	0.732
X3: How satisfied are you with your health?	0.72	0.27	0.15	0.40	0.697
X4: How satisfied are you with your capacity for work?	0.67	0.43	0.28	0.27	0.524
X5: How often do you have negative feelings such as blue mood,	0.68	0.58	0.02	0.17	0.602
X6: How satisfied are with the support you get from your friends?	0.82	0.41	0.18	0.12	0.681
X7: How satisfied are you with your sex life?	0.83	0.08	0.25	0.34	0.923
X8: How satisfied are you with your personal relationships?	0.75	0.15	0.30	0.24	0.964
X9::How much do you enjoy life?	0.88	0.023	-0.211	-0.45	0.632
Eigen values	5.46	5.20	3.98	4.32	
Explained variation (%)	54.60	52.0	39.80	43.20	

**Tab (6):** principle component analysis of associated parameters in PLHIV.

Categorical variables	Factors		
	P1	P2	P3
X1: Age	0.600	0.192	-0.169
X2: How would you rate your quality of life?	-0.361	0.475	0.036
X3: How satisfied are you with your health?	0.221	0.182	0.219
X4: How satisfied are you with your capacity for work?	0.486	-0.287	0.261
X5: How often do you have negative feelings such as blue mood,	0.304	0.703	-0.268
X6: How satisfied are with the support you get from your friends?	0.229	0.504	0.548



X7: How satisfied are you with your sex life?	0.559	-0.335	0.148
X8: How satisfied are you with your personal relationships?	0.221	-0.011	0.763
X9: How much do you enjoy life?	-0.401	0.412	0.364

**Tab (7):** Component transformation matrix of associated parameters in PLHIV.

Components	P1	P2	P3
P1	0.748	0.660	0.058
P2	-0.642	0.681	0.333
P3	0.205	-0.305	0.922
P4	0.149	0.086	-0.191
(%) Total variance	78.15	54.21	65.89

### Proof:

In our study, 800 PLHIV were considered. The results showed that males and females were 58.12% & 41.28% respectively (ODD ratio -0.98), Younger age group predominated over older age group, IQR (21-30 years). The lower the income, higher the risk of acquisition of infection. (Occupation and economic status of PLHIV is statistically significant - $P < 0.05$ ). Present study has higher prevalence in drivers (39.75%) and least in Agriculturists (12.75%). Single member infected in the family was (62.25%) with ODD ratio (2.36), two family members being infected (33.62%) with add ratio (4.89). The factor analysis of the ten items of categorical variables on ranking scale was taken into consideration; table (3) indicated that the most appropriate solution involved was F1, F2, F3 & F4. Demographic profile of the patients presented in Tab (1) – Age, were classified and accounted for 72 (9.00%) CI 95% 0.321-0.856 ie., <20 years. 21-30 years- 418(52.25%) CI 95% 0.66-0.963; 31-40 years- 225(28.15%) CI 95% 0; 423-0.658 and above 41 years- 85(10.62%) CI 95% 0.302-0.756; 425(53.12%) CI 95% 0.248-0.583 patients were illiterate.

The occupation of the patients were Agriculture - 102(12.75%) CI 95% 0.45-0.698, Agriculture and allied- 40(5.00%) CI 95% 0.789-0.211, House wives -45(5.62%) CI 95% 0.563-0.745, Commercial sex workers -50(6.25%) CI 95% 0.321-0.874, Vendor -55(6.87%) CI 95% 0.44-0.99, Skilled workers -30(3.75%) CI 95% 0.211-0.365, Asst workers- 45(5.62%) CI 95% 0.453-0.869, Salaried class - 42(5.25%), CI 95% 0.486-0.756, Businessmen -76(9.50%) 0.11-0.201 and Drivers registered for HIV care were more and accounted for 315(39.37%) CI 95% 0.453-0.698, the drivers are the bridge population for HIV transmission.

Most of the patients were of low income group ie, 563(70.37%) CI 95% 1.24-2.48 and high income group- 89 (11.12%) CI 95% 2.48-6.56.

Patients registered for HIV Care belonged to different religions. Hindus- 655(81.87%) CI 95% 0.112-0.856, Muslims -102(12.75%) CI 95% 0.236-0.78 and Christians- 43(5.375) CI 95% 0.24-0.63,

Nuclear families -440(55%) CI 95% 2.36-4.56, Joint families- 231(28.87%) CI 95% 1.28-6.36, and staying alone -129(15.62%) CI 95% 3.86-7.85.

401(50.12%) CI 95% 1.23-3.56 were married, Divorced- 274(34.25%) CI 95% 4.58-8.96 and Separated- 125(15.62%) CI 95% 3.86-7.85.

563(70.73%) CI 95% 0.398-0.635 had first sexual exposure at more than 18 years of age, 237(29.62%) CI 95% 0.745-0.525, had at <18 years of age. Life time sex partners in these patients (obtained from the patients thorough, in-depth interview (IID's) and focus group interview -FGI) was one partner in 158(19.75%) CI 95% 0.231-0.765, two life time partners in 475(59.37%) CI-95% 0.234-0.635, three partners in 102(12.75%) CI 95% 0.211-0.386 and >three partner 44(5.50%) CI 95% 0.369-0.421.

Type of sex practiced -Anal sex accounted for 35(2.61) CI 95% 0.486- 0.963, Oral sex 82 (7.25%) CI 95% 0.218-0.654 and vaginal sex 735(91.87%) CI 95% 2.31-3.33.

Seropositive status in family- one infected member- 498(62.25%) CI 95% 2.36-5.23, two infected- 269(33.62%) CI 95% 1.48-6.98, three infected-23(2.875) CI 95% 2.89-3.98 and More than three members infected was 10 (1.25%) CI 95% 3.28-6.89. Using WHO brief questionnaires, HRQOL, data obtained before initiation of HAART and after one year completion of HAART, each individual of 29 items were pooled and compiled for mean total scores. The mean total score before inception of HAART for physical domain was 58.10±102.10, Psychological -32.08± 660.03, Social relationship with others- 18.15±59.32 and Environmental-13.11±98.10. After one year completion of HAART, the impact of effective counseling, good adherence and clinical parameters had increased the HRQL level, the mean score of Physical domain recorded was 119.20±30.20, Psychological 83.16±17.62, Social relation 65.16±38.12 and Environmental domain 50.02±40.62 (Tab-2). Based on the above facts, present study concluded that, the prevalence of Psychological factor (Communalities 52.0 and Eigen value is 5.46) in HIV-infected population has ranged from 52 – 54 % Younger age, unemployment, lack of health insurance, low CD4+ cell counts, HIV-related symptoms, not having a partner, poor quality of social support, negative feelings of blue mood, lack of family support, unsatisfied sex life, not happy with personal relationships and use of recreational drugs were significant predictors of depression. Patients with HIV infection who are older than 35 years are more likely to suffer from depression, anxiety,

confusion, and fatigue. Insomnia, pain, and emotional disturbances correlated well with depression. The impact of psychiatric co morbidities, specifically depression, on the HRQOL of patients with HIV disease has been well documented. [39]. the presence of a major psychiatric disorder (independent of HIV-related disease progression) was associated with a negative impact on HRQOL dimensions of mental health, social functioning, and general health perceptions but not on physical health, role functioning, or pain. [41] A larger study showed that patients with comorbid mood disorders had significantly worse functioning and well-being than those without mood disorders.

## CONCLUSION:

Quality of life is a multi dimensional concept whose definition and assessment remains controversial. HIV/AIDS has a high economic impact on society. Overall self-perception of QOL has been shown to be a useful screening tool for assessing global QOL. QOL relates both to adequacy of the material circumstances and to the personal feelings about these. As health is generally cited as one of the most important determinants of overall QOL, it has been suggested that QOL may be uniquely affected by specific disease processes such as AIDS. There is a lack of clarity in defining QOL and concomitant operational difficulties in it ,but still there is urgency in evaluating the QOL in HIV-infected individuals. Future studies should encompass the evaluation of more determinants of QOL in HIV/AIDS. The constellations of HIV-related symptoms negatively affect the QOL for people living with HIV infection. Effective management of symptoms is important for improving QOL and potentially for maintaining a complicated daily regimen of ART. As HIV disease is among the most devastating of illnesses, having multiple and profound effects upon all aspects of life, the evaluation of QOL is very important. Although research has suggested relationship among various factors like ,psychosocial , environmental factors, Social relation, stigma discrimination and physical health. Much more research is still needed to document their potential influence on immune function, as well as health status, disease progression, and QOL among persons with HIV disease. It is also important to underline the role of consultation-liaison psychiatry in the diagnosis and treatment of HIV and AIDS. Stress management interventions for HIV-infected persons are a promising approach to facilitate positive adjustment. Additional research is needed to further evaluate the role of routine QOL assessment in patients who have HIV/AIDS. The factorial analysis model is more reliable statistical model and it can be made use of, to find out the latent effects of QOL domain in HIV infected population.

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## REFERENCES

[1] Development of the World Health Organization WHOQOL-BREF quality of life assessment. The WHOQOL Group. *Psychol Med.* 1998;28:551-8.

- [2] Clayton DJ, Wild DJ, Quarterman P, Duprat-Lomon I, Kubin M, Coons SJ. A comparative review of health related quality of life measures for use in HIV/AIDS clinical trials. *Pharmacoeconomics.* 2006;24:751-65.
- [3] Fauci AS. The AIDS Epidemic: Considerations for the 21st Century. *N Engl J Med* 1999;341:1046-50.
- [4] Walker N, Grassly NC, Garnett GP, Stanecki KA, Ghys PD. Estimating the global burden of HIV/AIDS: What do we really know about the HIV pandemic? *Lancet* 2004;363:2180-5.
- [5] Beck EJ, Miners AH, Tolley K. The cost of HIV treatment and care: A global review. *Pharmacoeconomics* 2001;19:13-39.
- [6] Halloran J. Increasing survival with HIV: Impact on nursing care. *AACN Clin Issues* 2006;17:8-17.
- [7] Kassutto S, Maghsoudi K, Johnston MN, Robbins GK, Burgett NC, Sax PE, et al. Longitudinal analysis of clinical markers following antiretroviral therapy initiated during acute or early HIV Type I infection. *Clin Infect Dis* 2006;42:1024-31.
- [8] Aranda-Naranjo B. Quality of life in HIV-positive patient. *J Assoc Nurses AIDS Care* 2004;15:20-7.
- [9] Hays RD, Cunningham WE, Sherbourne CD, Wilson IB, Wu AW, Cleary PD, et al. Health-related quality of life in patients with human immunodeficiency virus infection in the United States: Results from the HIV Cost and Services Utilization Study. *Am J Med* 2000;108:714-22.
- [10] Mannheimer SB, Matts J, Telzak E, Chesney M, Child C, Wu AW, et al. Quality of life in HIV-infected individuals receiving antiretroviral therapy is related to adherence. *AIDS Care* 2005;17:10-22.
- [11] Ruiz Perez I, Rodriguez Bapo J, Lopez Ruz MA, del Arco Jimenez A, Causse Prados M, Pasquau Liapo J, et al. Health-related quality of life of patients with HIV: Impact of sociodemographic, clinical and psychosocial factors. *Qual Life Res* 2005;14:1301-10.
- [12] Swindells S, Mohr J, Justis JC, Berman S, Squier C, Wagener MM, et al. Quality of life in patients with human immunodeficiency virus infection: Impact of social support, coping style and hopelessness. *Int J STD AIDS* 1999;10:383-91.
- [13] Ruiz-Pirez I, Olry de Labry-Lima A, Lopez-Ruz MA, del Arco-Jimenez A, Rodriguez-Bapo J, Causse-Prados M, et al. Clinical status, adherence to HAART and quality of life in HIV-infected patients receiving antiretroviral treatment. *Enferm Infecc Microbiol Clin* 2005;23:581-5.



- [14] Jia H, Uphold CR, Wu S, Chen GJ, Duncan PW. Predictors of changes in health-related quality of life among men with HIV infection in the HAART era. *AIDS Patient Care STDS* 2005;19:395-405.
- [15] Murdaugh C, Moneyham L, Jackson K, Phillips K, Tavakoli A. Predictors of quality of life in HIV-infected rural women: Psychometric test of the chronic illness quality of life ladder. *Qual Life Res* 2006;15:777-89.
- [16] Semba RD, Martin BK, Kempen JH, Thorne JE, Wu AW, Ocular Complications of AIDS Research Group. The impact of anemia on energy and physical functioning in individuals with AIDS. *Arch Intern Med* 2005;165:2229-36.
- [17] Breitbart W, McDonald MV, Rosenfeld B, Monkman ND, Passik S. Fatigue in ambulatory AIDS patients. *J Pain Symptom Manage* 1998;15:159-67.
- [18] Zinkernagel C, Ledergerber B, Battegay M, Cone RW, Vernazza P, Hirschel B, Quality of life in asymptomatic patients with early HIV infection initiating antiretroviral therapy: Swiss HIV Cohort Study. *AIDS* 1999;13:1587-9.
- [19] Ferrando S, Evans S, Goggin K, Sewell M, Fishman B, Rabkin J. Fatigue in HIV illness: Relationship to depression, physical limitations, and disability. *Psychosom Med* 1998;60:759-64.
- [20] Sarna L, van Servellen G, Padilla G, Brecht ML. Quality of life in women with symptomatic HIV/AIDS. *J Adv Nurs* 1999;30:597-605.
- [21] Schmitz MF, Crystal S. Social relations, coping, and psychological distress among persons with HIV/AIDS. *J Appl Soc Psychol* 2000;30:665-83.
- [22] Fleishman JA, Sherbourne CD, Crystal S, Collins RL, Marshall GN, Kelly M, et al. Coping, conflictual social interactions, social support, and mood among HIV - infected persons. *Am J Community Psychol* 2000;28:421-53.
- [23] Moneyham L, Hennessey M, Sowell R, Demi A, Seals B, Mizuno Y. The effectiveness of coping strategies used by HIV-seropositive women. *Res Nurs Health* 1998;21:351-62.
- [24] Carretero MD, Burgess AP, Soler P, Soler M, Catalan J. Reliability and validity of an HIV-specific health-related quality - of - life measure for use with injecting drug users. *AIDS* 1996;10:1699-705.
- [25] Crystal S, Fleishman JA, Hays RD, Shapiro MF, Bozzette SA. Physical and role functioning among persons with HIV: Results from a nationally representative survey. *Med Care* 2000;38:1210-23.
- [26] Marins JR, Jamal LF, Chen SY, Barros MB, Hudes ES, Barbosa AA, et al. Dramatic improvement in survival among adult Brazilian AIDS patients. *AIDS* 2003;17:1675-82.
- [27] Sowell RL, Seals BF, Moneyham L, Demi A, Cohen L, Brake S. Quality of life in HIV-infected women in the southeastern United States. *AIDS Care* 1997;9:501-12.
- [28] Murdaugh C. Quality of life in HIV-infected women in the southeastern United States. *J Assoc Nurses AIDS Care* 1998;9:59-71.
- [29] Coleman CL, Holzemer WL. Spirituality, psychological well-being, and HIV symptoms for African Americans living with HIV disease. *J Assoc Nurses AIDS Care*. 1999; 10:42-50.
- [30] Hays RB, Turner H, Coates TJ. Social support, AIDS-related symptoms, and depression among gay men. *J Consult Clin Psychol*. 1992; 60:463-9.
- [31] Leserman J, Perkins DO, Evans DL. Coping with the threat of AIDS: The role of social support. *Am J Psychiatry* 1992;149:1514-20.
- [32] Koopman C, Stone L, Ski DK. Emotional control, pain, sleep and depression among HIV-positive persons. Program and abstracts of the 12th World AIDS Conference; June 28-July 3. Geneva: 1998; Abstract 60558.
- [33] Holmes WC, Bix B, Meritz M, Turner J, Hutelmyer C. Human immunodeficiency virus (HIV) infection and quality of life: The potential impact of Axis I psychiatric disorders in a sample of 95 HIV seropositive men. *Psychosom Med* 1997;59:187-92.
- [34] Kelly B, Raphael B, Judd F, Perdices M, Kernutt G, Burnett P, et al. Suicidal ideation, suicide attempts and HIV infection. *Psychosomatics* 1998;39:405-15.
- [35] Wagener GC, Rabkin JG, Rabkin R. A comparative analysis of standard and alternative antidepressants in the treatment of human immunodeficiency virus patients. *Compr Psychiatry* 1996; 37:402-8.
- [36] Bogart LM, Catz SL, Kelly JA. Psychosocial issues in the era of new AIDS treatments from the perspective of persons living with HIV. *J Health Psychol* 2000;5:500-16.
- [37] Hoffman MA. HIV disease and work: Effect on the individual, workplace, and interpersonal contexts. *J Vocat Behav* 1997;51:163-201.
- [38] McReynolds CJ. Human immunodeficiency virus ( HIV) disease: Shifting focus toward the chronic

long-term illness paradigm for rehabilitation practitioners. *J Vocat Rehabil* 1998;10:231-40.

- [39] Voelker R. Protease inhibitors bring new social, clinical uncertainties to HIV care. *JAMA* 1997;277:1182-4.
- [40] Selwyn PA, Arnold R. From fate to tragedy: The changing meaning of life, death, and AIDS. *Ann Intern Med* 1998;129:899-902.
- [41] Bettinger M. Regaining lost abilities: The prospect of returning to work. *Focus* 1997;12:1-4.
- [42] Yallop S. The impact of health improvements for people living with HIV/AIDS (PLWHA) on returning to work. 12th World AIDS Conference, Geneva, June 18-July 3, 1998.
- [43] Banks MH. Psychological effects of prolonged unemployment: Relevance to models of work re-entry following injury. *J Occup Rehabil* 1995;5:37-53.
- [44] Lyketsos CG, Hoover DR, Guccione M, Dew MA, Wesch JE, Bing EG. Changes in depressive symptoms as AIDS develops. The Multicenter AIDS Cohort Study. *Am J Psychiatry* 1996;153:1430-7.
- [45] Dickey WC, Dew MA, Becker JT, Kingsley L. Combined effects of HIV - infection status and psychosocial vulnerability on mental health in homosexual men. *Soc Psychiatry Psychiatr Epidemiol* 1999;34:4-11.
- [46] Aro AR, Jallinoja PT, Henrikson MM, Lønqvist JK. Fear of acquired immunodeficiency syndrome and fear of other illness in suicide. *Acta Psychiatr Scand* 1994;90:65-9.