HEALTH-RELATED QUALITY OF LIFE AMONG PERSONS LIVING WITH HIV/AIDS IN 3 HOSPITALS IN THAILAND

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ABSTRACT: A cross sectional study looked at the association between socio-demographic factors, HIV/AIDS clinical history and health-related quality of life HRQOL in people living with HIV/AIDS. The 2008 study used the WHOQOL-BREF-THAI questionnaire which was completed by 3,736 patients in three Thai hospitals. Descriptive statistics and inferential statics (bivariate and multivariate) were used to test association between independent factors and HRQOL. Results: The majority of patients were males (57.8%) with mean age 41.7 (IQR 36 to 46), 91.5% currently on ARV for 5 years (IQR 3 to7), baseline CD4+ count was 359.5 cells/mm^3 (IQR 235 to 507.3), 35.1% experienced at least one AIDS related event, 89.8% had good treatment adherence. The following socio-demographic and clinical history factors had statistically significant association with decreased HRQOL: females, young age, separated, low education, low income, unemployed, having low CD4 count, high VL, poor adherence, history of more than two AIDS related events and CDC category C. Perception of HRQOL varied people living with HIV/AIDS. Conclusion: Measurement of HRQOL may assist in understanding the long term effect of disease and treatment people living with HIV/AIDS. The use of the WHOQOL-BREF questionnaire may help in identifying HIV positive patients with low HRQOL and in need of particular support, counseling and care.

Keywords: Health-related quality-of-life, HRQOL, WHOQOL-BREF, Thailand, HIV/AIDS, clinical HIV/AIDS.

INTRODUCTION: AIDS has a chronic debilitating course and it is important to understand and determine the socio-demographics and clinical factors that impact the high or poor quality of life in people living with HIV/AIDS (PHA). Health related quality of life (HRQOL) refers to how well a person functions and to his/her perceptions of well-being in the physical, mental, and social domains of life[1]. Assessing HRQOL has been used for documenting the burden of chronic disease, tracking changes in health over time, and comparing the overall effects of treatments. The provision of effective medical treatment has prevented and delayed disease and has prolonged PHA survival. Treatment effectiveness is, however, limited by insurgence of drug resistance, toxicity and side effects. The interaction with treatment and concurrent co-morbidities is increasingly complex[2].

Measuring HRQOL captures the overall impacts of interventions on patients' functioning and well-being, which goes beyond the interpretability and clinical meaning of immunologic and virologic markers[3]. Assessment of HRQOL in patients with HIV disease is of increasing importance, as it is an important method of measuring risks and benefits of prolonged therapies against a complex background of diverse morbidity.

MATERIALS AND METHODS: A cross sectional study was used to gather and analyse data from a larger observational prospective cohort study: THE PROGRESS (The Thai HIV Disease Progression: An Observational Database). This is a cross-sectional study because the baseline data only of THE PROGRESS were used. The study population included all 3,736 baseline

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patients attending the Medical Department of Bamrasnaradura Hospital in Bangkok, Sanpatong Hospital in the North and Lopburi Hospital in the Centre of Thailand. Socio-demographic data included: age, gender, race, ethnicity, income, education, current occupation. Clinical data included: years after HIV diagnosis, adherence to ARV, CDC Atlanta clinical category, AIDS-related events, ARV regimens, CD4+ cell counts and viral load (VL). The Thai version of the WHO short HRQOL questionnaire (WHOQOL-BREF-THAI) was used to measure quality of life.

The questionnaire included 26 HRQOL questions and each answered was measured with a Likert-type, five-point scale. Frequency, percentage, means, standard deviation, median, range and Interquartile range were calculated for the descriptive statistic of socio-demographic and clinical data. Inferential statistics to test significance of association between the independent variables (socio-demographic, clinical factors) and the dependent variable (HRQOL) used unpaired t-test for continuous variables, Pearson's Correlation (for the degree of correlation between two variables), one-way ANOVA (for normally distributed data) and Kruskal Wallis test (for three or more groups of sample data). The statistical significance was set against a value of 0.05.

RESULTS: The median age was 41.7 (IQR 36 to 46). The majority of patients were males (57.8%), 46.8% were married and 24.4% completed primary education (see Table 1)

Table 1: Socio-demographic characteristics of PHA

Variables	N	%
Sex (n= 3,736)		
Male	2,159	57.8
Female	1,577	42.2
Age (Years) (n= 3,736)		
Less than 31	224	6.0
31-40	1,600	42.8
41-50	1,396	37.4
>50	516	13.8
Median 41.7 (IQR 36 to 46)[1]		
Current Marital Status (n= 3,729)		
Widowed	469	12.6
Single	962	25.8

Variables	N	%
Married	1,745	46.8
Divorced	184	4.9
Separate	115	3.1
Cohabitants (Common law partners)	254	6.8
Educational attainment (n= 3,736)		
No certificate	96	2.6
Primary level certificate	905	24.2
Secondary level certificate	709	19.0
High School certificate	584	15.6
Associates/ Technical/ Vocational certificate	612	16.4
Bachelor of Science or Arts	733	19.6
More than BS/ BA	97	2.6

[1] Interquartile range (IQR), from 25th to 75th percentile

The largest group of respondents (25.3%) had 5,000-9,999 baths monthly income while 21.3% had less than 5,000 baths, 37.4% were wage earners, 89.8% were covered by health benefits schemes and 11% were not (see Table 2).

Table 2: Socio-economic characteristics of PHA

Variables	N	%
Income (Thai Baht) (n= 3,735)		
No income	392	10.5
<5,000	797	21.3
5,000 – 9,999	945	25.3
10,000 – 14,999	672	18.0
15,000 – 19,999	388	10.4
≥ 20,000	541	14.5
Current Occupation(n=3,736)		
Unemployed	432	11.6
Wage earner	1,397	37.4
Self-employed	647	17.3
Government Official	478	12.8
Working for Government Enterprise	160	4.3
Working for Private or Individual company	507	13.6
Others	115	3.1
Insurance Status (n= 3,736)		
Universal Coverage (UC) Scheme	1,276	34.2
The Social Security Scheme (SSS)	1,325	35.5
The Civil Servant Benefits Scheme (CSBS)	721	19.3
Self-supported	414	11.1

Table 3 shows the median duration of HIV infection was 7.0 (IQR 5 to 10) years. In particular nearly half (46.4%) of PHA were more than 8 years infected. CDC Category C was more frequent (61.9%) than other categories. Patients who experienced an AIDS event were 1,702 (45.5%).

Table 3: Clinical history of PHA

Variables	N	%
HIV History (n= 3,736)		
HIV Infection duration (Year)		
1-3 years	563	15.1
4-7 years	1,439	38.5
>8 years	1,734	46.4
Median= 7.0 (IQR 5 to 10)[1]		
CDC[2] Clinical category(n= 3,736)		
A	849	22.7
B	575	15.4
C	2,312	61.9
Patients suffering AIDS Event (n= 3,736)		
Yes	1,702	45.5
No	2,034	54.4
Frequency of AIDS-related events (N=1,702)		
1 Event	1,313	35.1
2 Events	293	7.8
>2 Events	96	2.6

Table 4 shows that most (95.1%) of all 3,557 PHA were on Antiretroviral treatment (ART) at baseline with a duration median of 5.0 (IQR 3 to 7) years. More than half (54.7%) of PHA had been on treatment for 4-7 years, 27.8% for 1-3 years and 17.6% for more than 8 years. Poor adherence was10.2% and good adherence was 89.8% at baseline. The median CD4 + count before ARV initiation was 212 cells/mm^3 (IQR 68 to 401.3) and at baseline 359.5 cells/mm^3 (IQR 235 to 507.3). Viral load was < 50 copies/ml for 64.4% of PHA at baseline.

Table 4: ARV therapy, CD4 count and viral load

Variables	N	%
Antiretroviral (n= 3,736)		
Current on ARV	3,557	95.2
None ARV	179	4.8
Duration of ARV treatment 1-3 years	988	27.8
Duration of ARV treatment 4-7 years	1,944	54.7
Duration of ARV treatment >8 years	625	17.6
Median 5.0 (IQR 3 to 7)		
Adherence (n= 3,736)		
Poor	380	10.2
Good	3,356	89.8
Mean ±SD = 14.3 ±2.2		
Median (QD) 15.0		
Group of CD4+ cell count at Baseline (n= 3,736)		
Unknown	446	11.9
1-199 cells/mm^3	628	16.8
200-499 cells/mm^3	1,803	48.3
>500 cells/mm^3	859	23.0
Median 359.5 (IQR 235 to 507.3)[1]		
Group of Viral Load (HIV RNA copies/ml) at Baseline (n= 3,736)		
Unknown	848	22.7
<50	2,406	64.4
50-5,000	379	10.1
5,001-20,000	26	0.7
20,001-100,000	41	1.1
>100,000	36	1.0
Median 49 (IQR 49 to 49)[1]		

The majority of PHA had *'moderate level'* of HRQOL in all domains and mostly in Environment Domain (71.1% of PHA) followed by Social relationship (70.5%), Physical health (66.75) and Psychological Health (53.4%). Overall level of HRQOL was moderate in 65.2% of PHA. A substantial minority of PHA had *'high level'* of HRQOL mostly in Psychological Health Domain (43.6% of PHA) followed by Physical Health (32.7%), Environment (26.9%) and Social relationship (18.6%). Overall level of HRQOL was high in 33.8% of PHA. Very few PHA had *'low level'* of HRQOL mostly in Social relationship Domain (10.9% of PHA), followed by Psychological health (3.0%), Environment (2.1%) and Physical health (0.5%). Overall level of HRQOL was low in 0.9% of PHA. Males had significantly higher QOL score than females in Physical health domain (p=0.011), Psychological Health (p=0.003) and Overall HRQOL (p=0.019).

Older age was significantly associated with low HRQOL in Physical health (p=0.040) and Social relationship (< 0.001), but significantly associated with high HRQOL in Psychological Health (p=0.014) and Environment (p<0.001).

Statistically high significant association (p<0.001), was found between low education level and low HRQOL and, conversely between high education and high QoL in all domains.

High income group (>20,000 baht/ month, circa 600 USD/month) was significantly associated with high HRQOL (p<0.001) and, conversely low income groups and unemployed with Low HRQOL in all domains. Widowed and married status had statistically significant higher HRQOL in Psychological health domain (p=0.003) and Environment (p=0.004). Separate status had lower HRQOL Psychological Domain (p=0.003) and Environment (p=0.004) than other groups. No significant difference was found between marital status and HRQOL in Physical health domain, Social relationship and Overall HRQOL.

Table 5 shows that shorter duration of ARV treatment (1-3years) had statistically significant association with Low HRQOL in Physical health (p<0.001), Psychological health (p=0.010), Environment (p=0.019) and Overall Domain (p<0.001). Conversely PHA with longer ARV treatment duration (4-7 years and > 8 years) had higher HRQOL.

Table 5: Duration of ARV treatment and HRQOL by *Kruskal Wallis Test and One-way Anova Test**

	N	Physical Mean±SD	Psychological Mean±SD	Social Mean±SD	Environment Mean±SD	Overall HRQOL Mean±SD
ARV Treatment Duration						
1-3 years	944	24.4±3.4**	1652.25*	9.7±2.0	26.7±4.2**	89.0±12.2**
4-7 years	1905	25.2±3.4**	1766.88*	9.8±2.0	27.1±4.2**	90.9±11.9**
>8 years	623	25.3±3.4**	1771.27*	9.9±1.9	27.3±3.9**	91.5±11.2**
P-value		<0.001	0.010	0.072	0.019	<0.001

* *Use Kruskal Wallis test in cases of Homogeneity of Variances less than 0.05*
** *Post Hoc Tests: Significant difference*

Table 6 shows that Adherences to ARV treatment had statistically significant association with high HRQOL in the Psychological Health Domain (p<0.001), Environment (p<0.001) and Overall HRQOL (p<0.001) but no statistically significant association in the Physical health and Social relationship domains.

Table 6: Correlation between HRQQL and Adherences to ARV by Pearson Correlation

	Details	Physical	Psychological	Social	Environment	Overall HRQOL
Adherences to ARV	Pearson Correlation Sig. (2-tailed)	0.014 (0.391)	0.091** (<0.001)	0.008 0.635	0.087** (<0.001)	0.071** (<0.001)
	N	3591	3591	3591	3591	3591

*Correlation is significant at the .05 level (2-tailed), ** Correlation is significant at the .01 level (2-tailed)

Table 7 shows that PHA with no history of AIDS-related events had higher HRQOL in the Physical health domain, Psychological health (p=0.005), Environment (p<0.001) and Overall HRQOL (p=0.001) compared to PHA with two or more AIDS-related events (p=0.015). PHA with history of only one AIDS related event had higher HRQOL than PHA with two or more events.

Table7: Relationship between HRQOL and AIDS-related events by One-way Anova Test** and *Kruskal Wallis Test

	N	Physical Mean±SD	Psychological Mean±SD	Social Mean±SD	Environment Mean±SD	Overall HRQOL Mean±SD
Frequency of AIDS-related events						
None	1924	25.1±3.3**	22.0±3.6**	9.9±2.0	1847.41	91.0±11.7**
1 Event	1291	24.9±3.5**	21.8±3.8*	9.8±2.0	1783.34	90.2±12.2**
2 Events	288	24.8±3.4**	21.5±3.6**	9.8±2.0	1631.86	89.1±11.6**
>2 Events	93	24.1±3.5**	20.9±4.1**	9.5±1.7	1513.23	86.9±11.7**
P-value		.015	.005	.155	<.001	.001

* Use Kruskal Wallis test in cases of Homogeneity of Variances less than 0.05
**Post Hoc Tests Significant difference found

Table 8 shows that PHA with history of 1-3 year duration of HIV infection had lower Physical health and Psychological health scores than PHA with longer history of IV infection (p<0.001). There was no statistically significant difference between any period duration of HIV infection and the domains of Social relationship, Environment and Overall HRQOL.

Table8: Relationship between HRQOL and Duration of HIV infection by One-way Anova Test** and *Kruskal Wallis Test

	N	Physical Mean±SD	Psychological Mean±SD	Social Mean±SD	Environment Mean±SD	Overall HRQOL Mean±SD
Duration HIV Positive Status (Year)						
1-3 years	528	24.3±3.5**	1679.23*	9.7±2.0	1730.98	1658.07
4-7 years	1,377	25.2±3.4**	1821.84*	9.9±2.0	1826.34	1836.43
>8 years	1,691	25.1±3.4**	1816.73*	9.8±1.9	1796.91	1811.46
P-value		<.001	.197	.194	.197	.197

* Use Kruskal Wallis test in cases of Homogeneity of Variances less than 0.05
**Post Hoc Tests Significant difference found

Table 9 shows that CDC category A had higher HRQOL in Psychological Health (p=0.023), Environment (p=0.001) and Overall HRQOL Domain (p=0.007) than CDC category C. No significant relationship between CDC category A and B was found.

Table9: Relationship between HRQOL and CDC Classification analyzed by One-way Anova Test**

CDC Classification	N	Physical Mean±SD	Psychological Mean±SD	Social Mean±SD	Environment Mean±SD	Overall HRQOL Mean±SD
CDC Category A	838	25.1±3.4	22.1±3.6**	9.9±2.0	27.5±4.0**	91.5±11.6**
CDC Category B	527	25.1±3.4	21.8±3.7**	9.9±2.0	27.0±4.2**	90.7±12.1**
CDC Category C	2,231	24.9±3.4	21.7±3.7**	9.8±2.0	26.8±4.2**	90.0±11.9**
P-value		.257	.023	.225	.001	.007

***Post Hoc Tests Significant difference found

Table 10 shows that lower CD4+ cell count before ARV initiation had statistically significant association with low HRQOL in Physical health domain (p<0.001), Social relationship (p=0.01), and Overall HRQOL (p<0.001).

Table10: Relationship between HRQOL and CD4+ count before ARV initiation by One-way Anova Test** and *Kruskal Wallis Test

	N	Physical Mean±SD	Psychological Mean±SD	Social Mean±SD	Environment Mean±SD	Overall HRQOL Mean±SD
CD4+ cell count before ARV initiation						
1-199 cells/mm³	1,347	24.7±3.4**	21.7±3.6	9.7±1.9**	26.8±4.1	89.5±11.6**
200-499 cells/mm³	1,142	25.2±.4**	21.9±3.7	9.9±2.0**	27.1±4.2	91.0±12.0**
>500 cells/mm³	457	25.5±3.5**	21.9±3.6	10.0±2.1**	27.1±4.2	91.5±12.1**
P-value		<0.001	0.211	0.010	0.081	<0.001
CD4 +cell count at Baseline						
1-199 cells/mm³	623	24.4±3.4**	21.4±3.6**	9.6±2.0**	26.5±3.9**	88.5±11.5**
200-499 cells/mm³	1,794	25.2±3.4**	22.0±3.6**	9.9±2.0**	27.2±4.2**	91.1±11.8**
>500 cells/mm³	858	25.3±3.3**	22.0±3.6**	9.9±2.0**	27.1±4.3**	91.2±11.9**
P-value		<0.001	0.001	0.028	0.004	<0.001

* Use Kruskal Wallis test in cases of Homogeneity of Variances less than 0.05

***Post Hoc Tests Significant difference found

Table 11 shows that low Viral Load (<50 copies/ml HIV RNA) at baseline had higher HRQOL in the Physical health domain (p=0.012), Psychological (p=0.038) and Overall HRQOL (p=034).

Table 11: Relationship between HRQOL and Viral Load by One-way Anova Test**and*Kruskal Wallis Test

Viral Load at Baseline (Copies per milliliter)	N	Physical Mean±SD	Psychological Mean±SD	Social Mean±SD	Environment Mean±SD	Overall HRQOL Mean±SD
<50	2,395	1449.64*	21.8±3.6**	9.9±2.0	27.0±4.2	90.7±11.9**
50-5,000	376	1427.81*	22.2±3.5**	9.9±1.8	27.4±4.0	91.6±10.9**
5,001-20,000	26	1070.90*	21.0±3.1**	9.5±2.0	25.9±4.0	86.9±10.3**
20,001-100,000	40	1226.71*	20.7±3.5**	9.5±1.6	26.4±3.8	87.3±10.3**
>100,000	35	1142.26*	21.3±3.9**	9.7±2.2	26.4±4.6	87.9±12.6**
P-value		0.012	0.038	0.623	0.119	0.034

* Use Kruskal Wallis test in cases of Homogeneity of Variances less than 0.05

**Post Hoc Tests Significant difference found

DISCUSSION: This study found that males perceived a higher HRQOL than females in 3 domains. This might be explained by the fact that males in Thai society have more power than females and with power comes hopefulness and optimism. Thai women, in spite of been more empowered than other Asian women, still suffer of low self-esteem from lack of positive perception of their role in society, being passive from a social and economic point of view, gender inequality, violence against women, reduced social and family support, and more stigma for being HIV infected compared to HIV infected males.

A study found that women had body fat changes (lipodystrophy) more often than men, were more likely to have, poorly identified and poorly managed headaches and more disease or stress related fatigue.[17] All the above factors can also explain why women suffer a lower HRQOL.

The study found that older age does not necessarily cause a reduction in HRQOL. In Psychological health and Environment domains older ages is associated with higher HRQOL. Is possible that older PHA had a more stable home environment, fewer work responsibilities and fewer lost opportunities in pursuing a career due to HIV status. The negative significant association between older age and low HTQOL in Physical health and Social relationship domain found in this study is confirmed by other studies. [4-6]

PHA with the marital status of 'separate' had lower HRQOL than other groups as supported by other studies. A functional family is the smallest and most fundamental social unit and supports its members to be physically, emotionally, mentally and intellectually healthy[7]. This support, in turn, increases the HRQOL

In this study high HRQOL in all domains was associated with high education, occupation and income. There is considerable evidence that low education attainment is strongly correlated with disease, health risks and mortality and vice versa. Education

affects health and mortality trough a number of pathways, such as lifestyle, health behavior, problem-solving abilities, social relations, self esteem, and stress management. Education leads to higher productivity, better job opportunities, and higher income.

CDC category A was associated with higher HRQOL in Psychological Health, Environment and Overall HRQOL domains than CDC category C as supported by several other studies [8,9]. PHA suffering from more than 2 AIDS related events had low HRQOL as confirmed by another study of PHA in northern Thailand[8].

As in other studies[10], ARV treatment of 1-3 year duration was significantly associated with low HRQOL probably due to more ARV drug-related toxicities, initial bad control of side effects, adaptation to new life routines imposed by the ARV treatment, etc.

PHA with history of 1-3 year infection had significantly lower HRQOL. This could probably due to the high anxiety and fear linked to initial discovery of been HIV positive HIV and not having had yet enough time to come to terms with having a life long chronic infectious disease.

Low CD4+ count and high VL were significantly associated with low HRQOL as in a similar USA study[11].

After CD4+ count, adherence to ART is the second strongest predictor of progression to AIDS and death. Non adherence may eventually undermine the dramatic improvements in HIV-related health parameters seen since ART has become available. Adherence to ART is closely tied to virologic, immunologic, and clinical outcomes. Small increases in adherence can result in significant improvements in these outcomes[12] and the letter ones to better HRQOL for PHA as shown in this study. High adherence had statistically significant positive correlation HRQOL for the Psychological Health domain, Environment and Overall HRQOL.

Conclusion: in this study the socio-demographic characteristic and clinical history factors having strong statistically significant association with decreased quality of life in PHA were: being female, separated, unemployed, having low education, low income, low CD4+ count, high VL, poor adherence, sufferings from more than 2 AIDS related events and being CDC category C. These findings should assist policy makers in adapting national HIV/AIDS programs to meet the health needs of PHA and their communities. Service providers, PHA groups and other community-based organizations should make larger use of HRQOL assessments, to identify PHA with low HRQOL and deliver appropriate services aiming at improving their quality of life.

Longitudinal cohort studies and countrywide cross-sectional studies to explore HRQOL of PHA should be carried out. Research should not focus on HRQOL level only but also on identifying local and national interventions that are effective in improving PHA quality of life. PHA with particular needs should receive additional support and care in particular counseling, links with peer support groups and other community based services that may improve their well being.

HRQOL is becoming an increasingly important issue in HIV infection and AIDS because the evolution toward treatment of HIV disease as a chronic illness presents additional challenges for patients and health care providers. HRQOL studies can provide useful additional information to behavioral and clinical studies and ultimately influence HIV-related morbidity and mortality.

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