



ASSOCIATION BETWEEN SOCIO-DEMOGRAPHIC FACTORS IN RELATION TO HEALTH-RELATED QUALITY OF LIFE OF PEOPLE LIVING WITH HIV RECEIVING HIGHLY ACTIVE ANTIRETROVIRAL THERAPY ATTENDING A PUBLIC HEALTHCARE SETTING IN SOUTH AFRICA.

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ABSTRACT

Background: People living with HIV/AIDS (PLWHA) and on antiretroviral therapy (ART) have their life expectancy increased because of advent of Highly Active Antiretroviral Therapy (HAART) that improves their longevity. However, a great threat to their health-related quality life (HRQOL) is the socio-demographic challenges. PLWHA can now live longer but with increasing rates of non-communicable diseases (NCDs). Thus, prevention of NCDs is crucial to maintain and gain health-related benefits and maximising their HRQOL in their long-term management. **Aim of the Study:** To determine association between Socio-demographic factors in relation to HRQOL of PLWHA receiving HAART attending a public healthcare setting in South Africa. **Methods:** A cross-sectional study was conducted using a convenient sampling to select 100 PLWHA attending at the HIV-clinic. Socio-demographic factors were obtained using a face-to-face interview in a Standardized Questionnaire. Health Related Quality of Life of HIV infected information was obtained using WHOQOL-HIV-BREF questionnaire. The data were analyzed by using Statistical Package for Social Sciences (SPSS) version 26 and presented as mean, standard deviation and ranges. Categorical and data presented by frequencies and percentages. Independent t-test and ANOVA were used to compare the continuous variables accordingly. A level of P – value less than 0.05 was considered significant. **Results:** Of 100 interviewed, 63% females and 37% males had mean-age of 38 years with 36% in age-range of 31-40 years, 47% had secondary-education, 20% were contract-employees, 32% receiving \geq ZAR10000 monthly, 55% were living in rural-areas and 42% were singles. Good health-status was reported in 92%, 72% having initial-CD4-count of \geq 500cells/mm³, 54% having initial-viral-load \geq 10000 copies/mL and 98% undetectable. Asymptomatic were 62% and 43% with WHO-clinical stage of 2. Only 24% had acceptable adherence-rate of \geq 90%. Socio-demographic factors that had significant association with WHOQOL were secondary educational level ($F = 2.58$; $P = 0.042$), age group of 31-40 years ($F = 3.609$; $P = 0.033$) and initial CD4 count of \geq 500cells/mm³ ($F = 4.936$; $P = 0.029$). **Conclusion:** The study demonstrated that patient's Socio-demographic factors, in respect to secondary educational level, age group of 31-40 years, and initial CD4 count of \geq 500cells/mm³ were significantly associated with HRQOL. Illiteracy is responsible for HIV-infection in different geographic areas; therefore, the healthcare system needs to strengthen universal basic education mandatory to further reduce HIV prevalence in certain age group, increasing CD4 count thus improving Health Related Quality of life of PLWHA.

KEYWORDS: Quality of life, Antiretroviral therapy, health-related quality of life, PLWHA.

INTRODUCTION

Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (HIV/AIDS) is a global concern, with the HIV infected patients suffering from this condition. According to UNAIDS in 2023,^[1] globally 39.0 million (33.1–45.7) people were living with HIV at the end of 2022. An estimated 0.7% (0.6-0.8%) of adults aged 15–49 years worldwide were living with HIV,

although the burden of the epidemic continues to vary considerably between countries and regions. At the end of December 2022, of 29.8 million PLWHA, 76% (65–89%) were accessing antiretroviral therapy (ART), up from 7.7 million in 2010. It is also reported that 77% (65–90%) of adults aged 15 years and older had access to treatment; however, just 57% (44–78%) of children aged 0–14 years had access to ART.

According to UNAIDS report [2] in fact sheet regarding gender, 82% (69–95%) of women aged 15 years and older had access to treatment; however, just 72% (60–8%) of men aged 15 years and older had access. Furthermore, 82% (64–98%) of pregnant women living with HIV had access to ART to prevent transmission of HIV to their child in 2022. Degroote et al. (2019)[3] in their study reported that in the same year, 9.2 million PLWHA did not have access to ART. Among the new HIV infections per day, about 61% were in sub-Saharan Africa (UNAIDS, 2019).[4] The percentage of all people living with HIV in SA decreased from 14.0% in 2017 to 12.7% in 2022.

This translates to approximately 7.8 million PLWHA in SA in 2022 compared to 7.9 million in 2017. Of the 7.8-million HIV-positive people in SA, about 5.8 million are on ART, according to the Tembisa HIV model. About 5.5-million people get their medicines from the public healthcare settings (Centre for Infectious Disease Epidemiology and Research working paper, April 2023.[5])

Health related quality of life (HRQOL) is a multi-dimensional concept that is affected by different variables. A large body of evidence shows that socio-demographic factors have a significant influence on HRQOL. There are differences in cultural contexts and social values of various countries and the lack of evidence regarding socio-demographic determinants of HRQOL in general population. It is therefore important to verify the main socio-demographic determinants of HRQOL.

According to the World Health Organization (WHO), quality of life (QOL) is an individual's perception of their position in life in the context of the culture and value systems in which they live and concerning their goals, expectations, standards, and concerns (WHO, 2019).[6]

As stated by Gakhar et al. (2013),[7] when the QOL is considered in the context of health and disease, it is referred to as health-related quality of life (HRQOL). Despite several QOL instruments the short form of World Health Organization Quality of Life, WHOQOL)-BREF-HIV[8] has been used to evaluate HRQOL of HIV-infected patients. Assessing HRQOL becomes an integral part of treatment to follow-up and provides valuable feedback about the effectiveness of therapeutic interventions. The healthcare system will thus identify the need to improve health services and investigate factors predicting to well-being of PLWHA.

With the advent of HAART, measurement of HRQOL in HIV/AIDS has advanced rapidly to evaluate the effectiveness of treatment and intervention programs.[5] Costa et al. (2013)[9] reported in their study that socio-demographic characteristics can affect the HRQOL of patients with HIV/AIDS. Moreover, injection drug use as

revealed by Tran et al. (2014),[10] alcohol drinking as reported by Rourke et al, (2012)[11] depression, and spiritual belief on their disease and medication had also an effect on the mental and physical health of HRQOL of HIV infected.

The report from UNAIDS (2023)[1] stated that although the HRQOL of patients has significantly improved after treatment with HAART, Campsmith et al. (2003)[12] had also reported that drug-related side effects, poor adherence to HAART, and irregular medical follow-up compromised HRQOL. The HIV/AIDS pandemic is the most important and urgent public health challenge facing governments and civil societies around the world (UNAIDS, 2023).[1] Health Related Quality of Life of PLWHA remains under-researched in Africa and particularly in SA. Therefore, this study aimed to examine the status of HRQOL and associated factors among PLWHA on HAART in a health care setting in SA.

AIM OF THE STUDY

To determine association between Socio-demographic factors in relation to HRQOL of PLWHA receiving HAART attending a public healthcare setting in South Africa.

PATIENTS AND METHODOLOGY

A cross-sectional quantitative design was used to collect the data. Patients living with HIV attend the clinic to receive ART, health care consultations, counselling support as well as those who need laboratory testing, together with those who need assessment of their biomedical markers (CD4 count and viral load). The study site was at the HIV clinic of the public primary health care clinic, in Mthatha – Eastern Cape Province of South Africa. The clinic serves a population of 45,600. Of this population, 3800 were people living with HIV and attended the AIDS clinic and were on ART. The study was conducted using a convenient sampling method in 100 people living with HIV- and attending an HIV- clinic that provide HIV services. The sample size was calculated based on confidence level of 95% ($Z\alpha = 1.96$) on confidence level of 10% and prevalence of participants with good knowledge of their condition ($P = 55\%$). The sample size estimation was determined using the formula $n =$ from the average and variance. The number in each group was calculated to be representative of the population at 95% confidence. The sample size estimation was determined using the formula $n = Z^2 \cdot P(100-P)/e^2$. $n = (1.96)^2 \cdot 55(100-55)/10^2 = 95$. Thus, the sample size was in the range between 75-100. The study was conducted from 1st January to 28th February 2022.

Inclusion and Exclusion criteria of participants

Inclusion criteria: The following inclusion criterion was used to sample the participants. Adult males and females aged over 18 years; living with HIV and AIDS. Those who attend the HIV clinic monthly for their ART repeat

treatments and or medical reviews. Those who were able to sign a written informed consent.

Exclusion criteria

Patients were excluded from the study if they did not consent or were acutely ill and required medical or surgical treatment or admission to the hospital.

Ethical considerations and official approvals

The participants were assured of their complete confidentiality throughout the study, by telling them that their names and identification were to be kept anonymous using identification codes. They were also informed that no research participant would be forced to answer any questions with which they felt uncomfortable. Participants were also informed of their right to withdraw from the study at any stage of the project, and that there was no harmful procedure involved.

All information was kept confidential in a password secured laptop and data used exclusively for the research purposes.

Administrative approvals were granted from the following

Permission and ethical approval to conduct the study was sought from Walter Sisulu University - Research Innovation, Higher degrees and Ethics Committees of the faculty of Medicine and Health Sciences (approval # 031/2017). After the issue of Ethical Clearance Certificate, the proposal was loaded into the department of health website. Then further clearance to conduct the study was sought from the manager of the municipality under which the clinic is, and finally from the manager of the HIV clinic where data was collected. After securing all the approvals, the participants were informed of the nature and intention of the study in their language of choice using a participant information sheet. The participant information sheet explained to them the objectives and benefits of the study. The participants were also given an informed consent form.

Data collection

Socio-demographic data were collected using standardized-questionnaire using face-to-face interviews and HRQOL data using WHOQOL-HIV-BREF questionnaire. Biomedical-markers were obtained from patient's medical-records; ART-adherence was calculated after performing pill-count method. An overall adherence rates was calculated using the following equation: Adherence rate = (Number of days of medication supplied within the refill interval / number of days in refill interval) X 100. The acceptable adherence rates were between 90% and 100%. Once permission had been sought from the clinic manager data was collected once off for each participant. The questionnaire was administered, and information obtained through face-to face interviews between researcher and participants. Sociodemographic characteristics data obtained were

gender, age, marital status, educational level, employment status, salary earned by month, HIV status, residence location, information related to HIV life how infected, type of ART regimen. Biomedical markers like CD4 count, viral load, WHO status was obtained from the participants' medical/clinical records to ensure the accuracy of the information. ART adherence was obtained by pill-count method and a formula was used to calculate adherence percentage.

Health Related Quality of life was assessed using a WHOQOL-HIV-BREF questionnaire using a 5-point Likert scale. WHOQOL-HIV-BREF was developed and validated by the WHO specifically for PLWHA; it evaluates QOL based on six domains and includes questions specific to HIV/AIDS. WHOQOL-HIV BREF is a short version containing 31 questions/items/facets distributed among one overall perception component and six QOL assessment domains, these being: physical health; psychological health; level of dependence; social relationships; environmental health; and spiritual/religious/personal beliefs (SRPB). These questions were distributed among six domains as already stated. The physical health domain measures the following facets: pain and discomfort, energy and fatigue, sleep and rest.

The questions of the WHOQOL-HIV-BREF are structured in a Likert type scale with the grades depending on the nature of the domains and facets. Each item is rated on a 5-point Likert scale with 1 indicating a negative perception and 5 indicating a positive perception. Thus, final scores are scaled in a positive direction where higher scores indicate better QOL. To make the QOL score comparable to WHOQOL-100 score, the mean domain scores of each domain was added to 25, so that scores ranged from 00 (minimum) to 100 (maximum) with highest scores indicating a better quality of life. The scores of the questions within each QOL domain are used to calculate the domain score, this being the mean of the scores of the questions.

Data Analysis

Data were analysed using SPSS-22 for basic descriptives. Descriptive statistics for all variables were generated. Continuous variables were summarised with mean and standard deviations. Frequency percentages were summarised categorical variables. Pearson's Chi-square was used to demonstrate the associations between participants' characteristics and whereas the Independent-samples t-test and ANOVA used to compare the mean score on HRQOL with statistical significance value of $P \leq 0.05$.

RESULTS

Socio-demographic, Clinical, behavioural, and biological characteristics

Of 100 interviewed, 63% were females and 37% males with mean age of 38.0 years (range 18-53 years). The highest (36%) were in age-range of 31-40 years, 47%

obtained secondary-level of education, 20% were employed on contracts and 32% received <R10000 monthly and 55% were living in rural-areas. Forty-two percent were singles. The majority (92%) of respondents reported good physical-health-status. More than half (72%) had initial CD4⁺count ≥ 500 cells/mm³, with 54%

having initial viral-load of >10000 copies/mL and 98% had undetectable viral-load. Seventy-one percent reported being infected with men. Sixty-two percent were asymptomatic and (43%) had WHO clinical-stage 2. Only 24% had acceptable adherence-rate (Table 1).

Table 1: Sociodemographic and Clinical Characteristics of the HIV-infected patients (n=100).

| Characteristic | n | % |
|----------------------------|----|----|
| Gender | | |
| Female | 63 | 63 |
| Male | 37 | 37 |
| Age group (years) | | |
| 18 – 30 | 30 | 30 |
| 31 – 40 | 36 | 36 |
| 41 – 50 | 24 | 24 |
| > 50 | 10 | 10 |
| Educational level | | |
| Illiterate | 2 | 2 |
| Primary | 24 | 24 |
| Secondary | 47 | 47 |
| Tertiary | 27 | 27 |
| Marital Status | | |
| Single | 42 | 42 |
| Married | 37 | 37 |
| Co-habiting | 7 | 7 |
| Separated | 8 | 8 |
| Divorced | 1 | 1 |
| Widowed | 5 | 5 |
| Employment type | | |
| Permanent | 12 | 12 |
| Contract | 20 | 20 |
| Unemployed | 33 | 33 |
| Self-employed | 15 | 15 |
| Income earned | | |
| ≥ 5000 | 12 | 12 |
| 5000-10000 | 20 | 20 |
| 10000 | 68 | 68 |
| Residence Area | | |
| Urban | 45 | 45 |
| Rural | 55 | 55 |
| Health Status | | |
| Neither poor nor good | 3 | 3 |
| Good | 92 | 92 |
| Very good | 5 | 5 |
| Initial CD4 count | | |
| >500 | 73 | 73 |
| <500 | 27 | 27 |
| Initial Viral Load | | |
| >10000 | 54 | 54 |
| <10000 | 46 | 46 |
| Current Viral Load | | |
| >10000 | 2 | 2 |
| <10000 | 98 | 98 |
| Adherence rate | | |
| Acceptable | 24 | 24 |
| Unacceptable | 76 | 76 |
| WHO Staging | | |
| Asymptomatic (Stage 1) | 34 | 34 |
| Mild Symptomatic (Stage 2) | 43 | 43 |
| advanced (Stage 3) | 23 | 23 |

Environmental health domain had the highest mean score, and Spiritual/Religious/Personal Beliefs domain had the lowest mean score as seen in Table 2. The internal reliability of the instrument was assessed. WHOQOL-HIV- BREF (Cronbach's alpha). The

following results of the Cronbach's alpha coefficient in the domains were adequate and as follows: physical health (0.268), level of independence (0.369), social relations (0.346), psychological health (0.298), environmental health (0.294) and SRPB (0.669).

Table 2: Mean Quality of Life Scores in Domains of Health-related Quality of Life.

| Dependent Variables | Study Participants (N=100) | | |
|--------------------------------------|----------------------------|---------|---------|
| Domain | Mean (\pm SD) | Minimum | Maximum |
| Environmental health | 77.00(\pm 14.94) | 25 | 100 |
| Social relations | 74.25(\pm 22.88) | 00 | 100 |
| Psychological health | 74.00(\pm 12.77) | 25 | 100 |
| Level of Independence | 64.50(\pm 19.84) | 00 | 100 |
| Physical health | 43.25(\pm 25.09) | 00 | 75 |
| Spiritual/Religious/Personal Beliefs | 26.25(\pm 26.44) | 25 | 100 |

SD = Standard Deviation

As demonstrated in Table 3, the distribution of sociodemographic scores in health domain were obtained. The results revealed that sociodemographic scores of statistically significant were in educational

level of the patients ($F = 2.838$; $P = 0.042$). Furthermore, other scores that were of statistical significance were in patients with who had initial CD4 count ($F = 4.936$; $P = 0.029$).

Table 3: Distribution of Socio-demographic scores and health domains.

| Variables | N | Mean \pm SD | Minimum | Maximum | F Value | P Value |
|--------------------------|----|-------------------|---------|---------|--------------|--------------|
| Gender | | | | | 0.212 | 0.646 |
| Female | 63 | 59.63 \pm 8.07 | 44.90 | 75.00 | | |
| Male | 37 | 58.84 \pm 8.67 | 37.40 | 44.90 | | |
| Age group | | | | | 0.720 | 0.542 |
| 18-30 | 30 | 59.99 \pm 7.49 | 47.50 | 72.50 | | |
| 31-40 | 36 | 58.46 \pm 7.45 | 44.90 | 70.00 | | |
| 41-50 | 24 | 60.83 \pm 9.90 | 45.00 | 77.50 | | |
| >50 | 10 | 56.99 \pm 9.36 | 37.40 | 65.00 | | |
| Educational level | | | | | 2.838 | 0.042 |
| Illiterate | 2 | 48.70 \pm 15.98 | 37.40 | 60.00 | | |
| Primary | 24 | 56.87 \pm 6.72 | 45.00 | 70.00 | | |
| Secondary | 47 | 61.27 \pm 8.92 | 44.90 | 77.50 | | |
| Tertiary | 27 | 58.34 \pm 8.26 | 45.00 | 75.50 | | |
| Marital Status | | | | | 0.896 | 0.489 |
| Single | 42 | 57.79 \pm 7.83 | 44.90 | 72.00 | | |
| Married | 37 | 59.59 \pm 9.08 | 37.40 | 75.00 | | |
| Co-habiting | 7 | 63.21 \pm 6.87 | 52.50 | 75.00 | | |
| Separated | 8 | 60.00 \pm 9.63 | 40.50 | 77.50 | | |
| Divorced | 1 | 62.50 | 62.00 | 62.50 | | |
| Widowed | 5 | 63.50 \pm 2.85 | 60.00 | 67.50 | | |
| Employment Status | | | | | 0.877 | 0.456 |
| Permanent | 30 | 60.49 \pm 8.24 | 45.00 | 77.50 | | |
| Contract | 32 | 59.77 \pm 8.30 | 45.00 | 72.50 | | |
| Unemployed | 33 | 59.39 \pm 7.74 | 37.40 | 72.50 | | |
| Self-employed | 15 | 56.34 \pm 9.45 | 44.90 | 75.50 | | |
| Initial CD4 | | | | | 4.936 | 0.029 |
| >500 | 72 | 58.22 \pm 7.99 | 37.40 | 77.50 | | |
| <500 | 27 | 62.31 \pm 8.55 | 44.90 | 75.00 | | |
| Adherence Rate | | | | | 3.690 | 0.058 |
| Acceptable | 24 | 56.55 \pm 8.27 | 45.00 | 77.50 | | |
| Unacceptable | 76 | 60.22 \pm 8.12 | 37.40 | 75.00 | | |

The distribution of sociodemographic scores and social health domain demonstrated that scores of statistical significances was only in patients of age group of

patients of 31-40 years with ($F = 3.609$; $P = 0.033$) as demonstrated in Table 4. This age group had the highest number of scores.

Table 4: Distribution of Sociodemographic scores and social health relations domain.

| Variables | N | Mean ±SD | Minimum | Maximum | F value | P value |
|--------------------------|----|-------------|---------|---------|--------------|--------------|
| Gender | | | | | 0.388 | 0.533 |
| Female | 63 | 76.81±12.94 | 37.50 | 93.75 | | |
| Male | 37 | 75.01±15.52 | 25.00 | 93.75 | | |
| Age group | | | | | 3.609 | 0.033 |
| 18-30 | 30 | 80.62±9.33 | 50.00 | 93.75 | | |
| 31-40 | 36 | 77.09±11.37 | 37.50 | 93.75 | | |
| 41-50 | 24 | 72.68±15.82 | 37.50 | 93.75 | | |
| >50 | 10 | 67.60±22.76 | 37.40 | 93.75 | | |
| Educational level | | | | | 2.510 | 0.063 |
| Illiterate | 2 | 56.25±44.19 | 25.00 | 87.50 | | |
| Primary | 24 | 73.25±13.45 | 43.75 | 93.75 | | |
| Secondary | 47 | 76.08±15.82 | 37.50 | 93.75 | | |
| Tertiary | 27 | 60±22.76 | 56.25 | 93.75 | | |
| HIV Status | | | | | 0.440 | 0.509 |
| Asymptomatic | 63 | 75.42±15.34 | 25.00 | 93.75 | | |
| Symptomatic | 38 | 77.42±11.26 | 50.00 | 93.75 | | |
| Adherence rate | | | | | 2.095 | 0.151 |
| Acceptable | 24 | 79.70±9.06 | 50.00 | 93.75 | | |
| Unacceptable | 76 | 75.02±4.98 | 25.00 | 93.75 | | |

An association was studied between sociodemographic characteristics and psychosocial risk factors of health-related quality of life with HIV/AIDS in quality of life, satisfaction with health, level of concentration, being blamed for HIV status, accepting bodily appearance, health safety and despair/anxiety. The results revealed sociodemographic variables of statistical significance were between gender and blame for HIV status ($P = 0.03$), despair/anxiety ($P = 0.05$); level of concentration ($P = 0.00$), accepting bodily appearance ($P = 0.01$), health satisfaction ($P = 0.00$), despair/anxiety ($P = 0.01$); marital status with life meaningful ($P = 0.01$), and accepting bodily appearance ($P = 0.05$). Regarding employment type there was no association.

DISCUSSION

The study determines the association between, Socio-demographics, and HRQOL in people living with HIV attending a public health care setting in South Africa. This is the first study of this kind that identified the influence of sociodemographic variables on HRQOL in various domains using WHOQOL-HIV BREF. Among the six domains of HRQOL, the mean score of 77.00 (± 14.94) was highest in the environment health domain. This domain includes physical security, housing, finances, and care.

The high quality of life in the environment health domain indicates better health care services. This means that PLWHA have access to quality health care and social assistance, acquisition of new information and new skills and leisure time. Results obtained in other studies differ. For example, a study performed in Nigeria by Odili et al. (2011)^[13] results revealed a higher mean quality of life score of 15.9 ± 3.05 in physical domain. In this study the lowest mean score of $26.25 (\pm 26.44)$ was revealed in Spiritual/Religious/Personal beliefs domain. On the contrary a study performed in India obtained the mean

quality of life score of $11.96 (\pm 3.15)$ as stated by Wig et al., 2006.^[14]

The impact of the disease on social factors like unemployment reduced social support and HIV-related symptoms may also contribute to depression and anxiety. This explains why in this study there no association between sociodemographic characteristics and employment status. The associations of poor quality of life with abnormal depression and anxiety indicates the need to identify these psychiatric comorbidities early among PLWHA in an effort to improve medication adherence for HIV. This was demonstrated in study that only 24% of HIV infected patients had acceptable adherence-rate. With acceptable adherence rates will improve HRQOL in PLWHA.

Limitations of the study

The study had some limitations as it included only patients taking HAART. Inclusion of people living with HIV who did not start HAART would have given a more comprehensive result. This also indicate that researchers with a different study design, including qualitative methods, can overcome this limitation. Another limitation to this study is that the study employed a cross-sectional study; meaning that a temporary association cannot be established.

Another limitation was that in this study, the sample of participants were drawn from the public health facility meaning that PLWA who avail services at private health facilities were not included which may limit the generalization of the results of the study.

CONCLUSION

The six domains of HRQOL were found to be high except the Spiritual/Religious/Personal Beliefs domain. The environmental health, social health and

psychological health of patients were higher than the rest of the HRQOL domains. In respect to the sociodemographic of patients, the educational level and initial CD4 were significantly associated with HRQOL. Then the age group, educational level of patients were significantly associated with social health domain HRQOL.

Therefore, the healthcare system needs to strengthen. The primary healthcare support can be used to improve the level of independence, physical health and SRPB of PLWA. Furthermore, there is need for social sensitization to avoid stigma and discrimination of PLWA. This will improve those domains of HRQOL and will also create a sense of safe living conditions or help PLWA to receive a necessary support from those people who know them.

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