

**SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA**



**QUALITY OF LIFE AMONG HIV AND AIDS PATIENTS IN THE
TAMALE METROPOLIS**

BY

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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA,
LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE
AWARD OF MASTER OF PHILOSOPHY IN APPLIED EPIDEMIOLOGY
AND DISEASE CONTROL DEGREE**

JULY, 2017

DECLARATION

I RAZAK GYESI ISSAHAKU, declare that this thesis is my original work undertaken under supervision, except for duly referenced works, no form of this has been presented elsewhere for another degree in this university or elsewhere.

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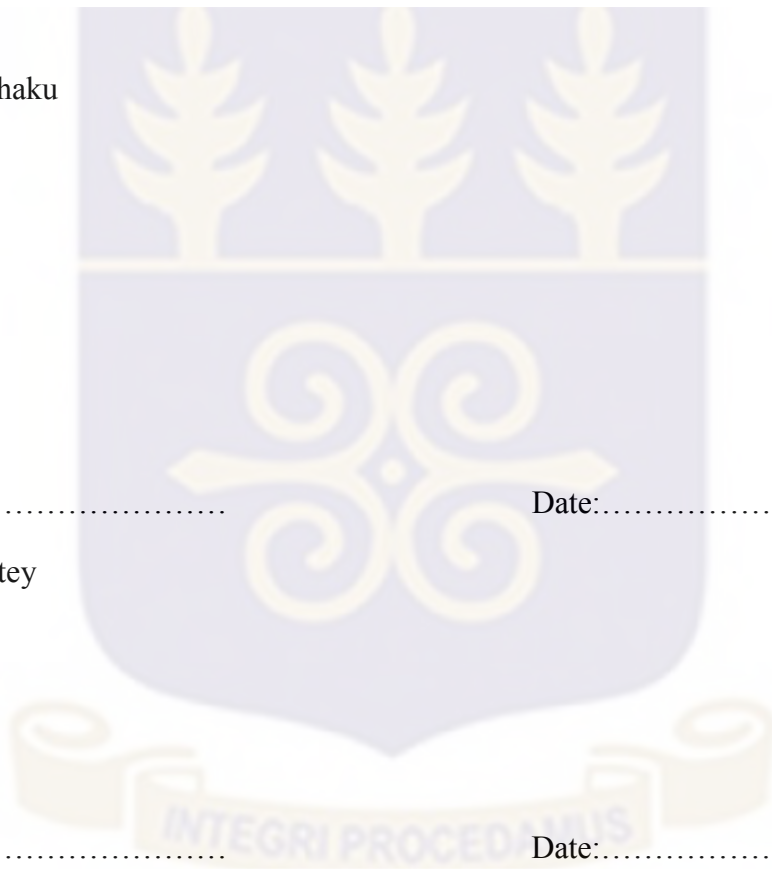
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DEDICATION

Dedicated to my dear wife (Anastasia Z. Adam) and my sweet and adorable daughters
(Sunshine and Katy)



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I am very grateful to my supervisor Dr. Priscillia Nortey for her guidance, direction and valuable contributions that helped in shaping this work.

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I wish to thank the patients and caregivers who consented to be part of this study.



ABSTRACT

Background: There has been a reduction in HIV and AIDS associated morbidity and mortality since the introduction of antiretroviral therapy. However, in contrast to the developed world, very little is documented about the influence of Highly Active Anti-Retroviral Therapy (HAART) on the Quality of Life of HIV patients in developing countries. In Ghana Quality of Life is rarely assessed. This highlights an important gap in the assessment of the health status of HIV and AIDS affected people in the clinical setting where access to HAART continues to increase. This study is to assess the Quality of Life of persons living with HIV and AIDS in the Tamale Metropolis using the World Health Organization Quality of Life – HIV BREF (WHOQOL-HIV BREF).

Method: A cross-sectional study was conducted at the Tamale Teaching Hospital. Patients were selected at random from the patient register using a random number generator on MS Excel and interviewed using the WHOQOL-HIV BREF. We assessed quality of life from responses to the WHOQOL-HIV BREF questionnaire. We took 3ml of blood from each patient for haemoglobin and CD4⁺ lymphocyte estimation. Variables collected with the questionnaire together with the test results were analyzed using Microsoft excel 2013 and Stata 14.0.

Results: Of the 377 study participants, 290 (76.9%) were females. The mean age of respondents was 39.80 ± 9.70 years. The males were significantly older than the females (45.51 years vs 38.09 years $p < 0.0001$), a majority of the study subjects (68.88%) were within the age bracket of 25-44 years. The highest domain scores for Quality of Life were recorded in the physical domain (13.81) and the lowest in the social relationship domain (9.89). The overall Quality of Life score was 12.81

Conclusions: Patients showed an overall good Quality of Life. They recorded good scores in the physical, environmental and psychological domains of Quality of life but poor scores in the social relationship and spirituality/Religious/Personal Beliefs domain. Being in a marital relationship, improved CD4 lymphocyte cell count, being in formal employment and being educated positively impacted the Quality of Life score of the participant in this study



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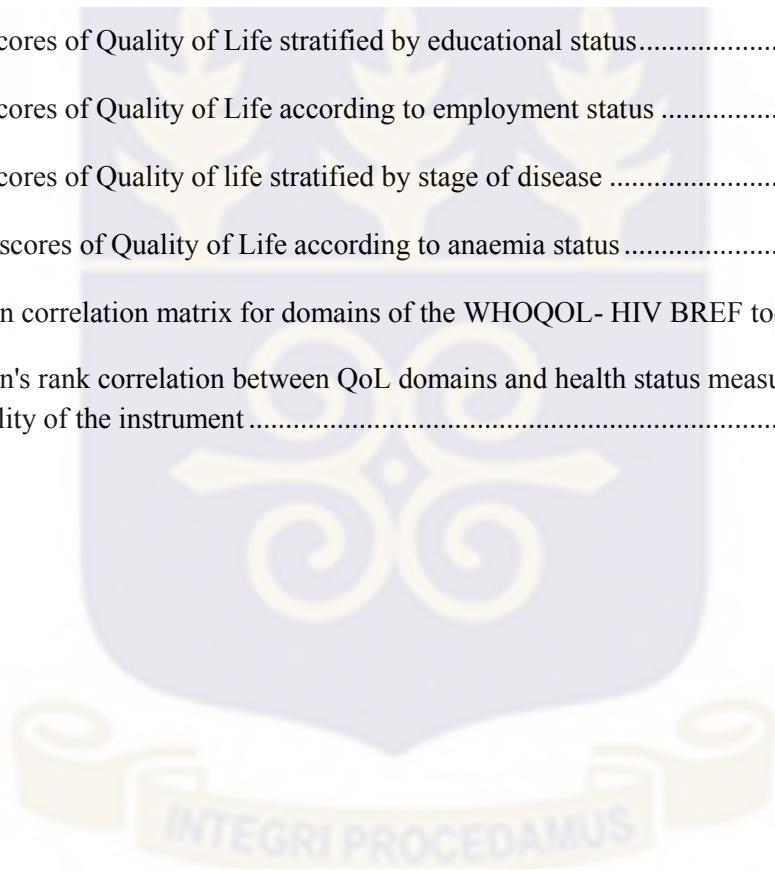
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LIST OF ABBREVIATIONS

AIDS	–	Acquired Immune Deficiency Syndrome
ART	–	Anti-Retroviral Therapy
BD	–	Becton Dickenson
CD3+	–	Cluster of Differentiation
CD4+	–	Cluster of Differentiation
CI	–	Confidence Interval
EDTA	–	Ethylene Diamine Tetra Acetic Acid
GAC	–	Ghana Aids Commission
HAART	–	Highly Active Anti-Retroviral Therapy
HB	–	Haemoglobin
HIV	–	Human Immuno-deficiency Virus
HRQOL	–	Health Related Quality of Life
PLWHA	–	People Living With HIV and AIDS
QOL	–	Quality of Life
SD	–	Standard Division
STI	–	Sexually Transmitted Infection
TTH	–	Tamale Teaching Hospital
UNAIDS	–	Unite Nations AIDS Commission
USA	–	United State of America
WHO	–	World Health Organization
WHOQOL-BREF	–	World Health Organization Quality of Life Bref

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) have been of a concern to the international health community for the past three decades. The disturbing increase in HIV and AIDS, poor access to Highly Active Anti-Retroviral Therapy (HAART), the disability and stigma associated with the disease, loss of output due to the ailment, and chronic nature of the disease has made it one of the most significant public health concern globally.

It is estimated that above 36.7 million persons are infected worldwide. Since the start of the epidemic, almost 78 million people have been infected with HIV and an estimated 35 million people have pass on as a result of HIV-related causes (WHO, 2015).

About 25.5 million people estimated to be were living with HIV and AIDS in sub-Saharan Africa as of the end of 2015. This accounts for over 46% of the global burden of HIV and AIDS. Nearly a million people died from HIV-related causes in sub-Saharan Africa in 2015 (WHO, 2015).

The first case of HIV reported in Ghana was in 1986 and by the close of 2014, a total of 150,000 cases had been recorded. According to the Ghana AIDS Commission (2017), this figure was perhaps just around 30% of the HIV and AIDS cases in the nation. Currently, the estimated national prevalence is 2.4% bringing the estimated number of cases to

about 657,840. Cases have been recorded in all the 10 regions and among all age groups (Ghana AIDS Commission, 2017).

With the number of infected people and those living with the disease continually on the increase coupled with the fact that the introduction of Highly Active Antiretroviral Therapy has led to a rise in the life expectancy of people living with the disease, the Quality of Life of the patients has become an important area in monitoring the impact of HAART and the general well-being of these patients.

According to Grossman *et al.* (2003), the advent of HAART has led to HIV and AIDS patients living longer as it is effective in suppressing viral load as well as reducing HIV associated morbidity and mortality. Patients now have the burden of having to deal with living with a chronic disease for the rest of their life.

Quality of life assessment is now applied in evaluating treatment outcomes on diverse populations. It has turned out to be an important treatment outcome in the time of Highly Active Antiretroviral Treatment (HAART), as opposed to mortality, CD4 count, viral load and the incidence of opportunistic infections which are traditional outcomes (Brecht *et al.*, 2004).

Quality of life measurements are progressively being used to complement objective clinical or biological measures of disease, for the assessment of quality of service, the effectiveness of interventions programmes and in utility cost analyses (Carr and Higginson, 2001). Quality of Life refers to a patient's perception that their current level of functioning is satisfactory. This concept is multifactorial in nature. Quality of life encompasses not only emotional well-being and functioning, but perceptions of physical

well-being (e.g., activity level, pain and general health perceptions) as well (Lechner *et al.*, 2003). Quality of life (QoL) is a relevant issue in the care and management of persons living with HIV and AIDS (O'Connell and Skevington, 2012).

Assessment of Quality of Life is currently considered essential for clinical trials development. This is because clinical and biological outcomes used during pharmacological trials are considered insufficient to catch the intricacies of care and treatment outcomes (Starace *et al.*, 2002).

Wong and Ussher (2008), is of the view that HIV and AIDS and its treatment affect the Quality of Life of the patients, and up to half of the number of patients on HAART may experience adverse effects of the medication and this may hinder the individual's ability to strictly follow the treatment regimen.

1.2 Problem Statement

Major improvement in medical treatment has resulted in PLWHA living longer. HAART has been linked to enhanced laboratory and clinical outcomes, leading to fewer opportunistic infections with a resultant decrease in morbidity and mortality (Akinboro *et al.*, 2014).

However, because patients would need to be on lifelong medication therapy, the side effects of this medication coupled with the constant stigma and discrimination experienced by PLWHA, concerns have been raised about other areas of health such as general physical and mental health functioning, psychological, environmental, socioeconomic and spiritual well-being. These areas of health in recent years have

emerged as important indicators in care and management of HIV and AIDS as they constitute indicators which are used in the assessment Quality of Life (WHO, 2004).

Evaluating Quality of Life HIV infected persons can be useful for understanding their experience. This will become very valuable as the population of HIV-positive persons ages, and to provide much needed health and social services (Miners *et al.*, 2014).

Scientists in the United Kingdom carried out studies comparing Quality of Life of HIV-positive and HIV-negative people. They found that, overall, HIV-positive persons had reduced Quality of Life. The HIV-positive persons had an increased likelihood of reporting feelings of anxiety and or depression (Miners *et al.*, 2014).

The lack of information on Quality of Life on HIV and AIDS affected populations, is a major challenge in Ghana and other resource-limited settings in Africa, despite the fact that there is an abundance of information on benefits of HAART, treatment regimens and economic effects of HIV and AIDS.

1.3 Conceptual Framework

Quality of Life (QoL) is influenced by a broad range of factors. However, the factors of interest in this study have been summarised in a conceptual framework (Figure 1).

The proposed framework of Quality of Life takes into account factors that have been categorised into social demographic factors and clinical factors. The socio-demographic factors include; sex, age, marital status, educational level and employment status. These socio-demographic factors either influence Quality of Life directly or through an intermediate. For example, marital status is linked to social support because in most

cases, married persons have families that can be a source of social support. Marital status, therefore, influences the social relationship domain of the Quality of life.

The clinical factors that influence the Quality of Life are haemoglobin and CD4⁺ lymphocytes count. These clinical factors also either influence Quality of Life directly or through an intermediate. For example, fatigue, which is a common manifestation of low haemoglobin, is associated with impaired physical function and therefore will negatively influence the Quality of life through the physical domain. Again the biological factors and socio-demographic factors, in turn, influence each other. A patient's educational level can influence his/her health seeking behaviour and this can, in turn, affect your haemoglobin level and CD4 counts. Likewise, their haemoglobin level and CD4 counts can determine their ability to stay on a job and stay employed or stay in school to be educated.

These factors interact differently to impact Quality of Life. A better understanding of how these factors affect the Quality of Life of individuals would be useful in the development of appropriate policy interventions that will contribute to effective management of HIV and AIDS patients.

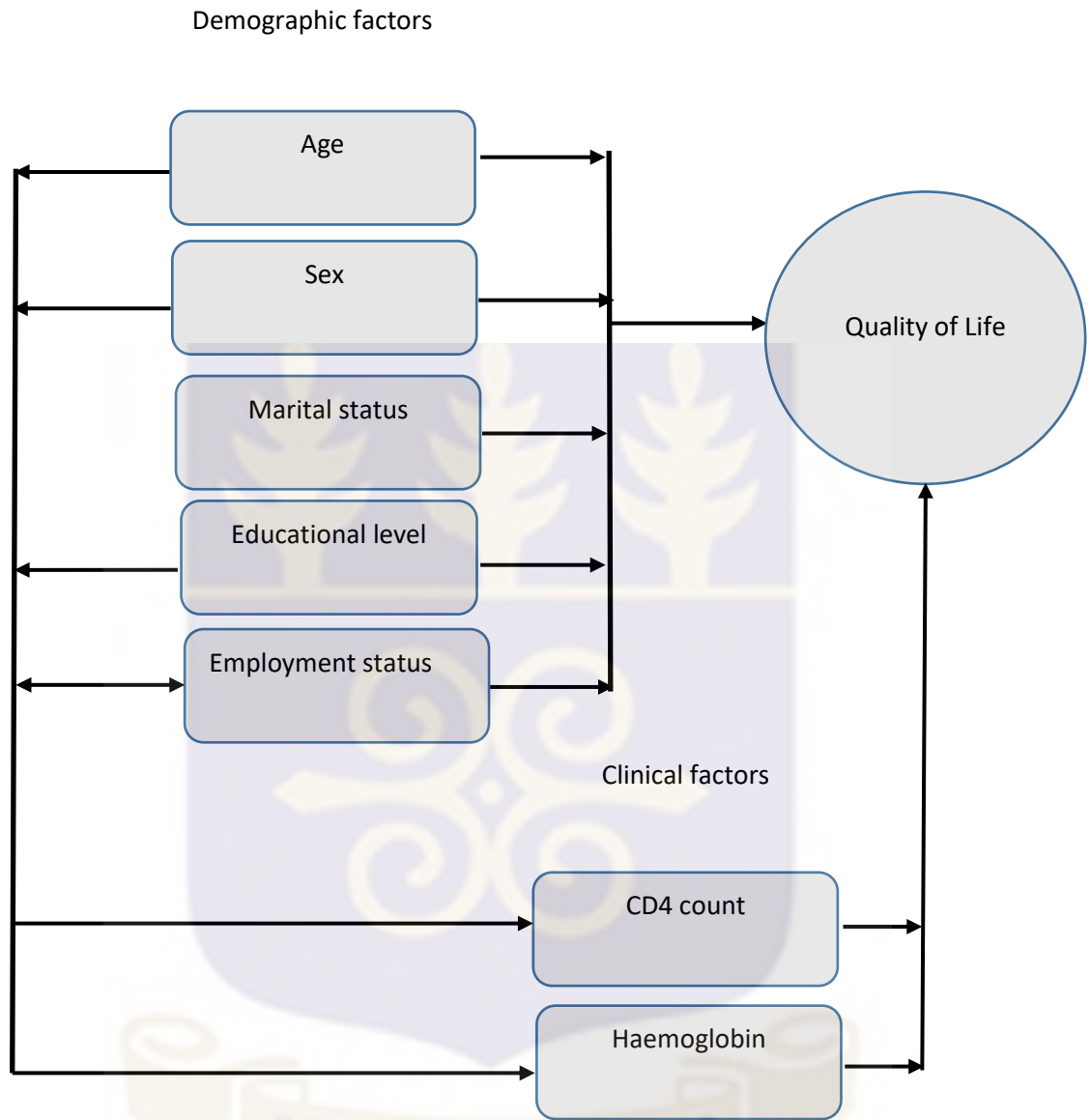
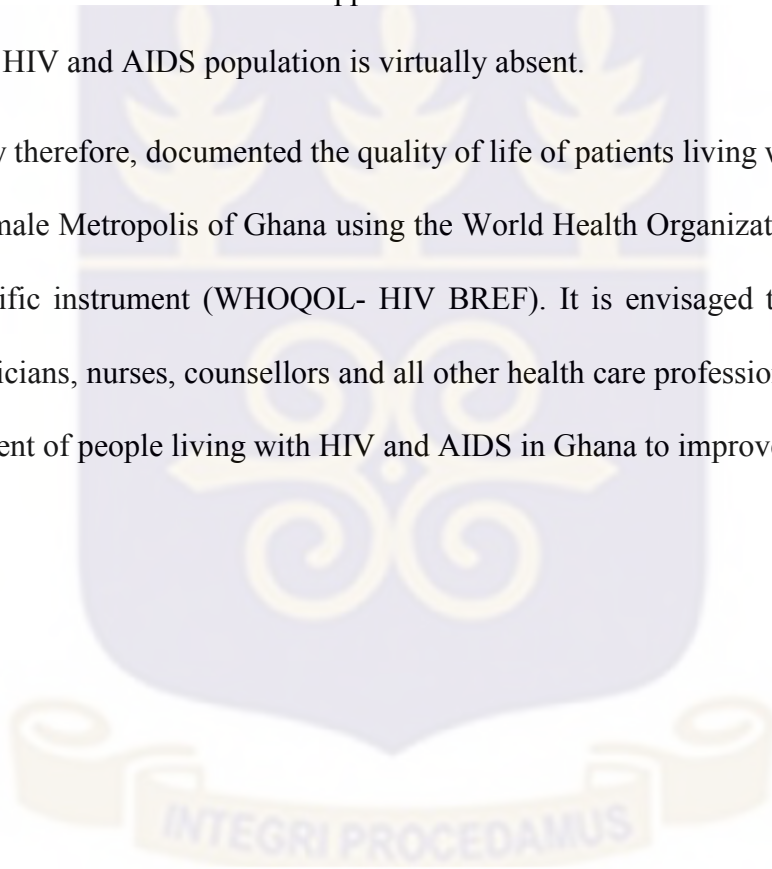


Figure 1: Conceptual framework; Quality of Life in HIV and AIDS

1.4 Justification

Very little information is available about the assessment of Quality of Life among people living with HIV/AIDS in Ghana, despite the fact that numerous studies on Quality of Life, have been conducted in the developed world and elsewhere in Africa such Ethiopia, Gambia and Nigeria. There are a number of measurement instruments available for measuring the Quality of Life among HIV and AIDS patients that allow for cross cultural comparison. The evidence of the application of these measurement instruments among Ghanaian HIV and AIDS population is virtually absent.

This study therefore, documented the quality of life of patients living with HIV and AIDS in the Tamale Metropolis of Ghana using the World Health Organization Quality of Life, HIV specific instrument (WHOQOL- HIV BREF). It is envisaged that the results will help physicians, nurses, counsellors and all other health care professionals involved in the management of people living with HIV and AIDS in Ghana to improve care.

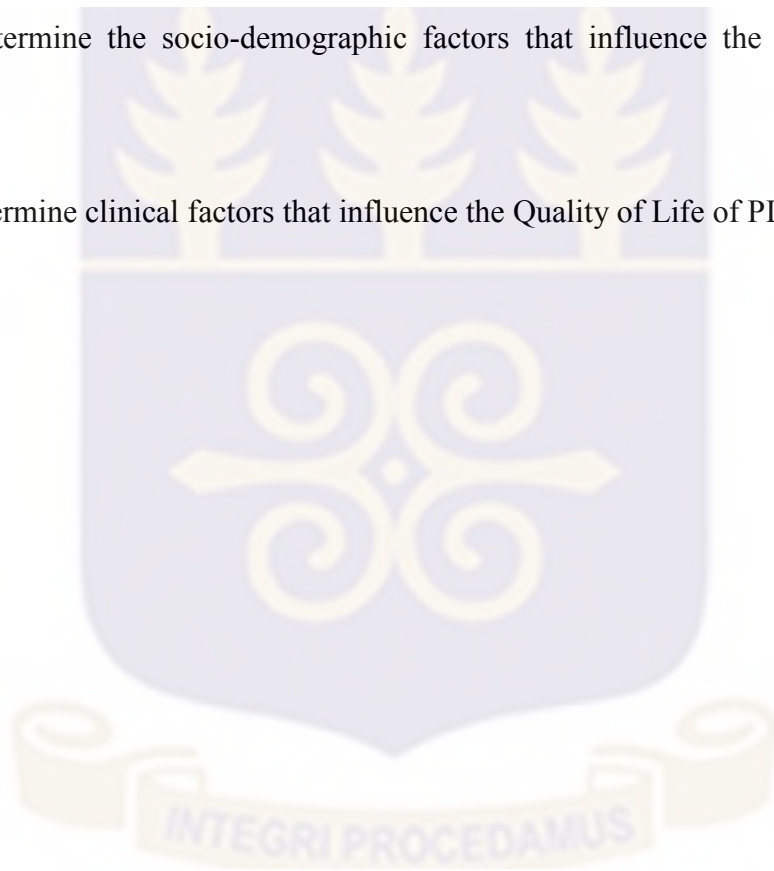


1.5 General Objective

To assess the Quality of Life of HIV and AIDS patients attending the antiretroviral clinic of the Tamale Teaching Hospital between March and May 2017.

1.6 Specific Objectives

1. To evaluate the domains of Quality of life of HIV and AIDS patients using the WHOQOL- HIV BREF.
2. To determine the socio-demographic factors that influence the Quality of Life of PLWHA
3. To determine clinical factors that influence the Quality of Life of PLWHA



CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Quality of Life

The World Health Organization (WHO) defines Quality of Life as “one’s 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, expectations standards, and concerns” (WHO, 1998).

The definition highlights the significance of a total feeling of subjective well-being concern with facets of happiness satisfaction and morale. Cummins (1997), is of the view that Quality of Life relates to the sufficiency of material situations as to how satisfied a person is with their circumstance of life.

According to Diener (2006), Quality of Life refers to the extent to which a person perceives his or her life as desirable or undesirable. Folasire *et al.* (2012), also defines Quality of Life as an assemblage of interrelating subjective measurements, which is subject to change over a period of time in response to life events, health events and personal experiences.

According to Grossman *et al.* (2003), while Quality of Life is an inclusive, wide-ranging concept that incorporates all factors affecting a person (economic status, health status, social functioning, well-being and life satisfaction). Health Related Quality of Life borders specifically on Quality of Life as it relates to health. They are, however, of the view that, in medical literature, the two terms are often used synonymously.

2.2 History of Quality of Life Assessment

The first study on the Quality of Life Scales was commenced in the United States of America in the 1970's. Adopting the critical incident technique, almost 3,000 people of different ages and racial groups from all parts of the United States of America were asked to contribute experiences that were satisfying to them. Substantial efforts were made to take into account views of ethnic minorities, rural dwellers, older citizens, and low-income groups (Burckhardt and Anderson, 2003).

However, the earliest efforts to examine non-biologic facets of patient's daily behaviour was the subjective measurements of functional health status, described as the capability to perform routine self-care and complete simple physical activities, and level of independent living (Prutkin, 2002).

Guides for happiness, well-being, and other "effects" had been advanced by social scientists to assess population phenomena and had been developed with psychometric or sociometric principles of measurement. The population results were not always appropriate for individual patients, whose most relevant Quality of Life factors might not have been added or appropriately weighted among the multiple items of the population instrument (Prutkin, 2002).

A separate problem was that a person's Quality of Life might be influenced much more by non-medical than by medical phenomena. Furthermore, the multi-item population instruments used at the time were not always accurate in assessing the changes that followed after therapeutic interventions (Burckhardt and Anderson, 2003).

Even though Quality of Life is now regularly discussed and evaluated in medical literature, these measurements seem to be done with diverse approaches, methods, and components. Among the components used in a number of studies are the : general health status, functional capacity, level of well-being, emotional function, life satisfaction, happiness, intellectual level, nausea and vomiting, pain, level of symptoms, fatigue, sexual functioning, memory level, social activity, financial status, and job status (Burckhardt and Anderson, 2003).

The current concept of health-related quality of life acknowledges that patients put their actual situation in relation to their personal expectation. An individual's expectation of their life can change over time and also reacts to external stimuli such as presence or absence of family support, length and severity of illness, etc. Just as any situation involving multiple views, patients' and physicians' evaluation of the same objective condition has been found to vary considerably. Therefore, Quality of Life is now typically assessed using patient questionnaires (Jongen *et al.*, 2010).

According to Burckhardt and Anderson (2003), Quality of Life questionnaires are often multidimensional and cover physical, social, emotional, psychological, work- or role-related functions, spiritual, religion or personal belief systems as well as a wide variety of disease related symptoms, biological factors, medication induced side effects, and even the financial impact of medical conditions. Even though it is often used interchangeably with the evaluation of health status, both Quality of Life and health status measure completely diverse concepts.

2.3 Importance of Quality of Life

The idea of Quality of Life is increasingly being recognised as a vital healthcare topic because the association between cost and value raises multifaceted problems, which often come with high emotive attachment because of the possible impact on human life. For example, health care workers must refer to cost-benefit analysis to make cost-effective decisions about access to costly drugs that may increase one's life span by a short amount of time and/or provide an insignificant increase to Quality of Life (Walker, 2005).

The assessment of Quality of Life as a measure of treatment outcome has become popular in both public health and clinical research because the notion of Quality of Life itself captures exactly the belief that the ultimate objective of medical intervention is for the improvement of the well-being of the patient (Olusina and Ohaeri, 2003). According to (Granek *et al.*, 2017) Quality of Life measurements showcases the World Health Organization's (WHO) definition of health as a "complete state of physical, mental and social well-being and not merely the absence of disease or infirmity"

Quality of Life is now being extensively used in estimating the effects of treatment on diverse HIV and AIDS populations. This has made it a key treatment outcome in the age HAART, instead of the traditional outcomes of mortality, the occurrence of opportunistic infections, CD4 count and viral load (Brechtl *et al.*, 2001).

Studies on Quality Life offers an evaluation of the influence of treatment or medication in chronic ailments for which progress in functional status and well-being is seen as an important outcome (Fayers and Machin, 2013).

An improved Quality Life has the ability to help a patient restart normal life, including working efficiently which will reassure long-term sustenance of treatment (Shor, 2014). However, According to Akinboro *et al.* (2014), poor Quality of Life may impacts negatively on lifelong adherence to therapy.

Quality of life as well functions as a pointer of prognosis among patients living with HIV and AIDS. This is because patients with lower physical and mental health scores have an increased incidence of mortality (de Boer-van der Kolk *et al.*, 2010).

2.4 Quality of Life Assessment Tools

With Quality of Life emerging as a key issue for HIV-infected persons, its routine assessment at Health facilities could be beneficial (Grossman *et al.*, 2003). Several Quality of Life assessment tools have been employed in the evaluation of Quality of Life. These Quality of Life assessment instruments can be categorized as either disease specific or generic. The generic instruments are intended to be used in diverse populations to a give a general overview of Quality of Life whiles the disease specific instruments are designed to evaluate Quality of Life in specific groups of people (Grossman *et al.*, 2003).

2.4.1 Generic Instruments

The Generic instruments used to measure the Quality of Life include Sickness Impact Profile (SIP), Linear Analogue Self –Assessment (LASA), Quality of Well-Being (QWB), Medical Outcome Study Short Form-36 (MOS SF-36), Nottingham Health Profile (NHP) and Cooperative Information Project Charts (COOP).

The Sickness Impact Profile (SIP) was formulated to measure sickness-related behavioural dysfunction and has been used to in various disabling conditions. It consists of 136 questions related to physical function, psychological, and other domains. The Sickness Impact Profile (SIP) can be self- or interviewer administered and usually takes 30 to 30 minutes. It has been shown to be valid, reliable and sensitive to sickness-related dysfunction (Davis *et al.*, 1994).

The Quality of Well-Being (QWB) scale examines five dimensions of health: self-care, mobility, institutionalisation, social activities and symptoms. The Quality of Well-Being (QWB) scale defines Quality of Life on a continuum from death to well-being, integrating mortality and morbidity into a single numeric index. It consists of 50 questions that can be administered by a trained interviewer, by phone if necessary and usually takes 10 to 20 minutes to complete (Hays *et al.*, 2009).

The psychometric characteristics of Quality of Well-Being (QWB) include acceptable reliability and validity. The QWB can be used to calculate cost-utility or differences in well-years experienced by groups because it includes death as the lowest possible score (Hays *et al.*, 2009).

Medical Outcomes Study Short Form-36 (MOS SF-36) was a prospective observational study of the impact of characteristics of patients, providers, and health systems on the outcome of care. Numerous measures of health status and Quality of Life were developed and assessed in this study. The SF-36 can be self-administered and takes about 10 minutes to complete. Although it is short, its scope is moderately comprehensive. Studies support the reliability and validity of this instrument in HIV and AIDS populations. It has

been culturally translated and adapted in to over the 50 languages worldwide (Lowrie *et al.*, 2003).

The Linear Analogue Self-assessment (LASA) questionnaire is a brief measurement instrument, used widely in patients with cancer. It consists of three questions that evaluate daily activity, energy level, and overall Quality of Life. LASA employs a 100-mm linear analogue scale for responses; the opposite ends are the negative and positive ends for each measured variable, with 100 being the highest and 0 being the lowest score. The tool is easy to apply and takes about 2 minutes to complete (Singh *et al.*, 2014).

2.4.2 Disease-Specific Instruments

The Medical Outcome Study HIV (MOS-HIV) Health Survey was developed to measure facets of functional status and well-being in HIV-infected patients during clinical trials.

The original framework for this survey was the MOS SF-20. Some sixteen items from the SF-20 was combined with additional items relevant to HIV from the MOS survey, and 5 other items that measure Quality of Life formed this 35-item, disease-specific instrument (Groves *et al.*, 2010).

Ten dimensions and health transition are evaluated in the MOS-HIV: general health perception, physical and role functioning, energy/fatigue, pain, social functioning, cognitive functioning, mental health, health distress and Quality of Life (Groves *et al.*, 2010).

The MOS-HIV can be interviewer administered (face-to-face or telephone) or self-administered. This instrument is usually completed in less than 5 minutes. The subscales

of the MOS-HIV are scored on a summed rated scale from a 0-to-100, with mental health and physical health summary scores being generated using a computer program.

The MOS-HIV has been used widely in clinical trials and has been translated into about 20 languages worldwide. A disadvantage of the MOS-HIV is that it does not cover some aspects pertinent to HIV infection, such as sexual dysfunction, somatic symptoms, eating behaviour, sleep and body image (Stangl *et al.*, 2012).

HIV-Quality of Life Questionnaire (HIV-QL31) was developed employing the methodology of SIP to measure the impact of HIV infection from the patient's view point. Without modifying an existing generic tool or disease-specific tool, the HIV-QL31 was framed directly from an examination of HIV-infected patients' concerns (O'Brien *et al.*, 2010).

The tool is a yes or no assessment tool and the dimensions include sexual activity, psychological aspects, pain, relationships, activities of daily living, aspects connected with disease, somatic aspects, and impact of care and treatment. The HIV-QL31 discriminate well in relation to severity of illness. However, the HIV-QL31 has not been widely studied, therefore its responsiveness to change is unknown (Garvie *et al.*, 2009).

Functional Assessment of HIV Infection (FAHI) is another tool specific to HIV. The FAHI was originally developed using the Functional Assessment of Cancer Therapy. It measures both generic and disease-specific Quality of Life for patients with such chronic diseases as cancer. In an effort to better capture aspects important to the HIV-infected population, a revised version constituting 27 items from the original core instrument and

17 new items reflecting specific HIV AND AIDS concerns was developed (Garvie *et al.*, 2009).

The FAHI evaluates functional well-being, physical well-being, and global well-being, social well-being, emotional well-being, living with HIV, and cognitive functioning. It yields a total score and individual subscale scores. The FAHI is available in 10 languages and has good psychometric properties. Although it has not been used extensively, it has been used to demonstrate significant improvement in Quality of Life following treatment of anaemia with recombinant human erythropoietin (epoetin alfa) in HIV-infected patients (Cella *et al.*, 2010).

HIV and AIDS Quality of Life (HAT-QOL) instrument was also developed from worries of HIV-positive patients. HAT-QOL has a total of 42 items, scored on a 5-point Likert type scale, cover the following dimensions: sexual function, disclosure worries, HIV mastery, health worries, financial worries, medication concerns, life satisfaction, provider trust and overall function (a combination of physical, role, and social) (Trevino *et al.*, 2010).

The HAT-QOL is a relatively new tool and comes with psychometric problems (including suboptimal internal consistency, poor scaling success rates and ceiling effects) in 3 of 9 of its dimensions. The developers recommend that the HAT-QOL be combined with a generic Quality of Life tool for a comprehensive evaluation of Health Related Quality of Life (Holzemer *et al.*, 2009).

The European Organization for Research and Treatment of Cancer Core Quality of Life Questionnaire (EORTC QLQ-C30) is a self-administered questionnaire that consists of

30 items and was initially used during an oncology clinical trial. A 20-item AIDS-specific module is also available. The EORTC QLQ-C30, with its proven reliability and validity, is widely used. It has been translated into a number languages. However, with the addition of the AIDS module, it's time-consuming (Holzemer *et al.*, 2009; van de Poll-Franse *et al.*, 2011).

2.5 The World Health Organization Quality of Life HIV instrument (WHOQOL-HIV)

There has been an increasing number of tools designed to evaluate the Quality of Life of People Living with HIV and AIDS. Even though, instruments such the MOS-HIV have been translated into various languages, improvements in the methodology established by the WHOQOL Group has facilitated the availability of language versions with greater similarity between cultures than ever before (Hasanah *et al.*, 2011), there was the need for better semantic and conceptual equivalence to improve metric equivalence, hence providing more reliable and valid data for comparative purposes (Skevington, 2012).

The WHOQOL-HIV is a multi-dimensional tool developed through a distinctive international collaboration that allowed researchers from diverse cultures to come together to share ideas and agree on a 'universal' model of Quality of Life of people living with HIV and AIDS. An international protocol for each phase of the quantitative and qualitative development work was formulated. During the development of the WHOQOL-HIV, focus groups of patients, community members and health professionals were held concurrently in participating" (O'Connell and Skevington, 2012).

2.5.1 WHOQOL-HIV BREF

This is an abridged version of WHOQOL-HIV instrument. The psychometric development of the WHOQOL-HIV BREF followed similar processes as the WHOQOL-HIV. Additionally, five facets of Quality of Life considered imperative to focus groups of people with HIV in six culturally diverse nations are added. These new concepts are, social inclusion (social relationships domain), symptoms of PLWHA (physical domain), fear of the future, death and dying and forgiveness (spiritual domain).

The WHOQOL-HIV BREF is made up of 31 items, scored on a 5-point Likert scale. The 31 items are divided in six domains which are: Physical health, Level of independence, Psychological health, Environment, Spirituality/Religion/Personal and Social relationships. The physical domain evaluates pain and discomfort, sleep and rest and energy and fatigue. The psychological health domain evaluates positive feelings, thinking, memory and concentration, learning, self-esteem, negative feelings, body image and appearance.

The Level of independence health domain evaluates mobility, dependence on medications, daily life activities, and work capacity. Social relationships domain measures personal relationships, sexual activity and social support. Spirituality/Religion/Personal beliefs health domain measures forgiveness and blame, death and dying and concerns about the future. The environment domain assesses physical safety and security, financial resources, accessibility and quality of home environment, health and social care, opportunities for acquiring new information and skills, ability to participate in recreation and leisure activities, and the physical environment. Two items are determined separately: one which asked about the persons

general perception of his or her health, and another which asked if he or she considered himself or herself currently ill (WHO, 2004).

Domain scores are positively scaled, this means higher scores indicate higher Quality of Life. The average score of the items contained in each domain was converted to a 0-20 scale in accordance to guidelines by the WHO for scoring the WHOQOL-BREF. Following instructions for scoring the WHOQOL-BREF, the assessment of a domain is discarded, where over 20% data is missing. Where a single item is missing, the average of other items in the domain was substituted.

The domain score is not calculated, when more than two items are missing from the domain, with exception of social domain, where the domain score is not calculated if any of the items is missing.

The WHOQOL-BREF for HIV has numerous vital features. It can be used to evaluate not just Quality of Life outcomes from HIV infection but also in situations of multiple comorbidities that accompany HIV infection, such as opportunistic infections, for example tuberculosis (O'Connell and Skevington, 2012).

Again, because the WHOQOL- BREF for HIV can be used to evaluate Quality of Life of uninfected persons, it can assess the Quality of Life of populations at risk from HIV infection e.g. sex workers and partners. According to O'Connell and Skevington (2012), good measures of discriminant validity were previously recorded between well persons and those asymptomatic with HIV or AIDS. Also, it is used to assess Quality of Life during different disease stages" (UNAIDS, 2009).

Special Quality of Life assessments intended for use by specific groups of people, for example, injecting drug users, sex workers, men who have sex with men (MSM), will no longer be a problem, as the WHOQOL-HIV BREF can be applied to everyone. This enables valuable contrast in varied situations. These qualities overcome the loss of comparative data as the flexibility of this instrument allows for a common metric to be reliably applied across groups, and in instances where repeated measurements are needed. This cross-cultural instrument is valuable in sub-Saharan Africa (van Rensburg, 2009).

The perception of QoL is also influenced by other factors including, age, educational level, marital status, employment status, and income and these are independent of the health status (Briongos Figuero *et al.*, 2011).

2.6 Demographic variables and Quality of Life

Age is reported to be associated with Quality of Life. Older people are generally associated with lower physical health (Kowal *et al.*, 2008; Gibson *et al.*, 2011) and with an increased degeneration in physical health over time (Protopopescu *et al.*, 2007) most likely due to physical senescence. There could be a positive relationship between younger age and improved mental health (Gibson *et al.*, 2011).

In a study using WHOQOL- HIV BREF tool, older people showed lower QoL scores in the physical domain whereas younger people presented lower environmental and spiritual domains of Quality of Life (Agrawal *et al.*, 2014)

Education has been reported from previous studies as a factor that influence's Quality of Life of People Living With HIV and AIDS. Higher educational level was found to be associated with better scores for observed overall Quality of Life, general health status

psychological health, the level of independence, social relationships and environment domains according (Peltzer and Phaswana-Mafuya, 2008). Again, Santos *et al.* (2007), is of the view that education is linked to Quality of Life and the relationship is linear. People with higher education are more likely to enjoy better Quality of Life.

According to Protopopescu *et al.* (2007), an education of not more than five years is negatively associated with physical health change and that it is probable that a lower educational status is a proxy for lower socio-economic status, but may also represent a decreased ability to understand the therapy combinations.

In a study conducted to establish the relationship among level of income, employment status and Quality of Life of PLWHAs in Calgary, Alberta, it was reported that, household income is associated with Quality of Life. The study also revealed that employment seemed to be a robust predictor of Quality of Life (Imam *et al.*, 2011). Again, Corless *et al.* (2013), reported in a study of HIV-positive persons that unemployed people had reduced health index scores compared to employed people. This they attributed to the inability of sick people to stay on a job and the fact that individuals who are sicker were more likely to quit their jobs, and not that unemployment directly affected Quality of Life.

In another study by Bunjongmanee *et al.* (2014a) on Quality of Life assessment among PLWHA in Thailand, being employed and living with either spouse or children or both were significantly influenced Quality of life positively.

A number of Quality of Life studies have recognized gender variations in Quality of Life measures. Men have been shown to have better scores in some Quality of Life domains compared to women (Santos *et al.*, 2007; Chandra *et al.*, 2010; Vigneshwaran *et al.*,

2013). In these studies, higher Quality of Life scores were reported by men in the physical and environmental domains and women reported higher scores in the spirituality/religion/personal beliefs domain. According to Chandra *et al.* (2010), this could mean that women are more spiritually inclined compared to men.

Rao *et al.* (2007), reported lower Quality of Life domain scores in women compared to men and attribute this to the health seeking behaviour of the two groups. They explained that, since this is subjective study women were more likely to report their unfavourable situations than men as men are generally expected by society to adopt an extra stoical attitude. Vigneshwaran *et al.* (2013), is of the opinion that gender differences in Quality of Life could also be a result of variances in mental illnesses. They opined that mood disorders, psychosomatic disorders and anxiety disorders are more common in females, contributing to possibly differences in Quality of Life.

In direct contrast to these, Peltzer and Phaswana-Mafuya (2008) found men's general health perceptions and perceived overall Quality of Life, to be lower than the women's when they analysed the WHOQOL-HIV BREF, among 607 PLWHA from a number districts of the Eastern Cape Province of South Africa. Better coping tactics in females and a higher proportion of anxious men in that sample, respectively, were proposed as explanations for those findings.

Gowda *et al.* (2012) and (Folasire *et al.*, 2012), however, did not find any differences in the Quality of Life among men and women in their studies in India and Nigeria. Folasire *et al.* (2012), attributed this finding to differences in the demographic profiles of the study subjects as they were more females compared to males.

2.7 Spirituality and quality of life

Fan *et al.* (2011), in their study, examined the spirituality and religion of patients with HIV and AIDS and determined the changes in the levels of spirituality over the course of the disease. The study concluded that most HIV and AIDS patients in that population belonged to one or more organised religious groups and sought solace in their religion as a coping mechanism.

In a study using WHOQOL-HIV BREF tool, elderly people demonstrated better QOL in the Spiritual domain while younger subjects reported lower Environmental and Spiritual domains scores of Quality of Life (Khumsaen *et al.*, 2012). However, another study by Agrawal *et al.* (2014) in Nepal did not find any difference in spirituality and religion in terms of age.

2.8 Social support and Quality of life

Social support talks about the perceived comfort, care, or help a person gets from other people such as the spouse, friends, family, colleagues or health workers (Ahmed *et al.*, 2007). Family members, especially a spouse, seem to be the most important bases of social support, and accounts directly for most of the relationship between Quality of Life and social support. There is an indication that support from outside the family sources cannot replace support that is missing in the family (Bray and Campbell, 2007).

Folasire *et al.* (2012), used a qualitative method to evaluate the degree to which social, psychological, economic and environmental variables contribute to the enhancement of the Quality of Life of PLWHA. It was presumed that people who had better access to care and social support will exhibit better Quality of Life compared to those without

access. The study provided a number of ideas of factors PLWHA considered essential for their Quality of Life.

An assessment of factors that influence QoL showed that accessibility to care and social support from the family and friends were ranked highest followed by financial pressure, stigma and discrimination. Other significant factors included, health concerns and counselling. In another study Adedimeji *et al.* (2010), found that, the desire for care and support greatly determined the readiness to divulge information about the patients HIV status. Where clinical support is not anticipated, information about a person's status is withdrawn and this will greatly influence the individual's Quality of Life.

A stable relationship invariably contributes to a good Quality of Life. This was reported by Préau *et al.* (2007) in their study among French HIV population. In another study in Spain, being single was linked with an improvement in QoL while being married was associated with a deterioration in QoL (Moro-Valdezate *et al.*, 2014). Being chronically ill possibly foundations more health distress and anxiety in married people, since the ailment can hamper their role as partners. However, a stable spouse was also found to be positively linked with better Quality of Life (Oguntibeju, 2012).

2.9 Anaemia and Quality of Life

Anaemia is a usual haematologic aberration in HIV disease according to Owiredu *et al.* (2011). In HIV-infected persons, anaemia has been reported to be associated with increased morbidity and mortality, progress to AIDS and reduced Quality of Life (Revicki *et al.*, 1994; Obirikorang and Yeboah, 2009b).

The incidence of anaemia is linked with the progress to HIV disease as evident in CD4 count. This relationship according to Obirikorang and Yeboah (2009a) is most probable described by the increased viral load as the disease progresses, and this could result in anaemia via increased cytokine mediated myelosuppression.

On the other hand, improved survival in HIV disease has been associated with recovery from anaemia (Moore, 1999). Low haemoglobin levels have been linked to advanced HIV disease and the increased incidence of immunosuppression among HIV patients (Kreuzer and Rockstroh, 1997) with the incidence of anaemia reported to increase as HIV disease advances (Semba and Gray, 2001).

In the developing world, the incidence of anaemia is higher compared to the developed world, Semba *et al.* (2000) and Hinderaker *et al.* (2002) are of the opinion that anaemia in Sub-Saharan Africa is caused by nutrient deficiencies, malaria, parasitic infection, AIDS, and sickle cell disease. Anaemia is mostly more prevalent with higher rates among people with HIV disease compared to people without HIV (van den Broek *et al.*, 1998; Semba *et al.*, 2000).

Evans and Scadden (2000), report the causes of anaemia in among people with HIV infection to include; an effect on hematopoietic stem cells by the virus, action of antiretroviral drugs, opportunistic infection, iron deficiency and bone marrow infiltration by neoplasm. In their review of the pathophysiology of anaemia in HIV infection, Kreuzer and Rockstroh (1997) highlighted the diversity of factors involved: bone marrow infiltration by neoplastic diseases, the effect of HIV on hematopoietic progenitors, opportunistic infections, effects of malnutrition; the use of myelosuppressive drugs and

the presence of anti-erythrocyte antibodies. The multifaceted network of factors involved according to Enawgaw *et al.* (2014), often makes it challenging to use conventional procedures to reach a conclusive diagnosis on the aetiology of HIV-related anaemia.

Anaemia of normocytic normochromic nature is the major form of anaemia reported among HIV and AIDS patients (Dikshit *et al.*, 2009; Gedefaw *et al.*, 2013). According to Semba and Gray (2001), HIV patients on HAART have a decreased likelihood of developing severe anaemia compared to those who are not on therapy. HAART naïve patients according to Obirikorang and Yeboah (2009a), have increased odds of developing microcytic hypochromic anaemia compared to HAART treated subjects. Owiredu *et al.* (2011), are of the view that general nutritional insufficiencies in the form of malnutrition found in HIV patients account for the increased occurrence of microcytic hypochromic anaemia in this population.

On the other hand, HIV patients on HAART are with an increased risk of developing macrocytosis when compared to those who are not on therapy (Obirikorang and Yeboah, 2009b). The aetiology of macrocytosis in HAART treated HIV patients as explained by Max and Sherer (2000) is drug provoked thymidine triphosphate deficiency which results in the blockage of stem cell maturation. Another possible cause of macrocytosis in HIV infected subjects as opined by Romanelli *et al.* (2002) is thought to be an influence of a nucleoside analogue in the retroviral drugs that act on DNA polymerase in the erythroid precursor initiating cell cycle arrest and compromised erythrocyte maturation.

Anaemia is a most common clinical abnormality in HIV and AIDS patients, with prevalence estimates ranging from 63% to 95% in different clinical settings (Sullivan *et*

al., 1998). And the frequency and severity of anaemia is and usually associated with shorter survival times in HIV-infected patients (Sullivan *et al.*, 1998).

In addition to being the primary symptom of anaemia, fatigue is a most common symptom among HIV and AIDS patients and is usually associated with impaired physical function and poor quality of life (QoL) (Fauci and Clifford Lane, 1998).

Despite the high prevalence of anaemia and fatigue among HIV and AIDS patients, their effects are often unnoticed. Frequently, so much attention is concentrated on CD4 lymphocyte counts and viral load that the physician may not even consider the occurrence of anaemia until the patient becomes short of breath, even at rest. This is unfortunate because anaemia can significantly affect the ability to carry on normal activities of daily living (Abrams *et al.*, 2000). In a similar study, 8% of patients with haemoglobin levels defined as high (12 g/dL) reported that they could not work at all (Volberding *et al.*, 2004). Therefore, treatments aimed at increasing haemoglobin levels should also improve Quality of Life.

Findings from trials of patients with cancer, Chronic Kidney Disease, HIV and AIDS, showed clinical and Health Related Quality of Life benefits of treatment aimed at improving haemoglobin (Kimel *et al.*, 2008). This finding is true in both between-group differences shown in Randomised Control Trials and within-group changes in single arm studies, where significant improvements in haemoglobin, fatigue and Health Related Quality of Life is very much evident. This positive relationship is predominantly evident when evaluating fatigue and hemoglobin correction to approximately 11–12 g/dl as recommended in HIV/AIDS clinical practice guidelines (Volberding *et al.*, 2004).

2.10 CD4 count and quality of life

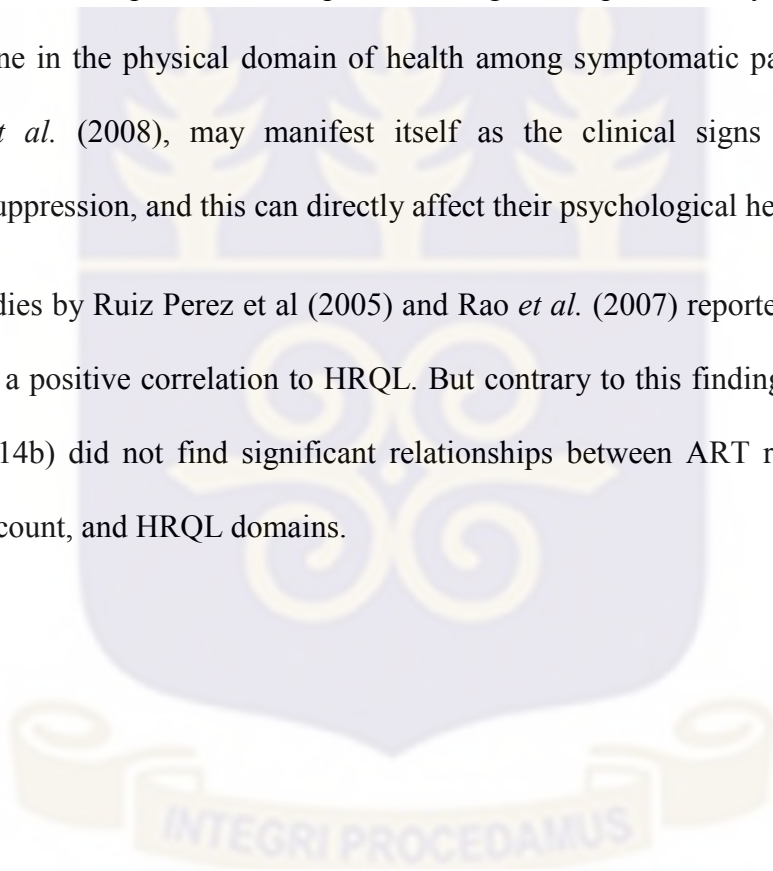
Normal absolute Cluster of differentiation antigen 4 (CD4) count ranges from 500 to 1500 cells/mm³ of blood. There is a progressive decrease in the CD4 cell count as HIV disease progresses. The CD4 count normally will increase in response to effective therapy combination, even though this may take a number of months. CD4 count Measurement therefore used to evaluate and monitor response to HAART. The CD4 count enumerates the number of CD4 or T-helper cells in the blood (Gowda *et al.*, 2012). The estimation of the CD4 count for patients on HAAART is suggested after every six months to monitor immunological improvement.

CD4 functions as a co-receptor for HIV, its numbers reduce over time with a proportionate decrease in the immune response integrity, which is restricted by the use of HAART (Eller, 2001). Jelsma *et al.* (2005), found CD4 to be associated with Quality of Life especially in the psychological and physical domains. Gowda *et al.* (2012), also found a significant association between Quality of Life and CD4 counts; subjects with improved CD4 count had higher Quality of Life scores compared to those with lower CD4.

In the evaluation of Quality of life in HIV/AIDS patients in a tertiary hospital in South India, QoL scores were reported to be significantly lower among people with lower CD4 count (Marashi *et al.*, 2009). In their study in Sao Paulo, Brazil, Santos *et al.* (2007) reported that patients with CD4 cell counts less than 200 cells/mm³ had lower Quality of Life scores compared to their those with higher CD4 counts.

Again Reis *et al.* (2010) showed that Quality of Life also declines with increase in an clinical staging. Fatigue which is a common symptom linked with HIV infection is associated with poor Quality of Life particularly in the physical domain (Eller, 2001). Nirmal *et al.* (2008), in their study also reported that Quality of Life scores were significantly poorer among persons with decreased CD4 counts. Symptomatic patients are those that have started exhibiting some typical symptoms of immunosuppression and therefore are more probable to experience fatigue compared to asymptomatic patients. The decline in the physical domain of health among symptomatic patients according to Nirmal *et al.* (2008), may manifest itself as the clinical signs and symptoms of immunosuppression, and this can directly affect their psychological health.

Other studies by Ruiz Perez et al (2005) and Rao *et al.* (2007) reported that the CD4 cell count has a positive correlation to HRQL. But contrary to this findings, Bunjongmanee *et al.* (2014b) did not find significant relationships between ART regimen, viral load, CD4 cell count, and HRQL domains.



CHAPTER THREE

3.0 METHODS

3.1 Study Design

A Cross-sectional study done at the antiretroviral clinic of the Tamale Teaching Hospital between March and May 2017.

3.2 Study Area

Tamale is the regional capital of the Northern Region and is the Ghana's fourth largest city. The region's total land area is 70,384 km sq. and with an estimated population of 2,479,461. The inhabitants are mainly peasant cash and crop farmers who largely live in rural areas (Ghana Statistical Service, 2011). The Northern Region shares boundaries with Brong Ahafo and Volta regions to the south of Ghana, Upper East and West regions to the north, to the east with Togo and to the west with Cote d'ivoire. The Region had a total population of 2,479,461 based on estimates from the population and housing census of 2010.

The Tamale Metropolis is situated right in the heart of the Region and has a total projected land area of 750 km sq. A total of 197 communities are in the Metropolis with 164 of them being rural. The 2010 population and housing census reported a total population of 371,351 for the Tamale Metropolis. This comprised of 185,356 males and 185,995 females" (Ghana Statistical Service, 2011).

HIV and AIDS is a significant issue throughout Ghana and efforts have been mobilised for prevention and care across the country. The Northern Region often receives less direct

attention and funding for HIV, as it does not rank as high in HIV prevalence as in the other regions. The HIV prevalence in the Northern Region rose from 0.6% in 2014 to 1.2% in 2015 and declined to 0.7% in 2016 (Ghana AIDS Commission, 2017).

Despite the fact that the region has the lowest prevalence rate of HIV in the country, stigmatization and discrimination against people living with HIV and AIDS is a common occurrence because of the nature of the communities in the region. The Quality of life of their patients should be of great concern to care givers and programme managers alike.

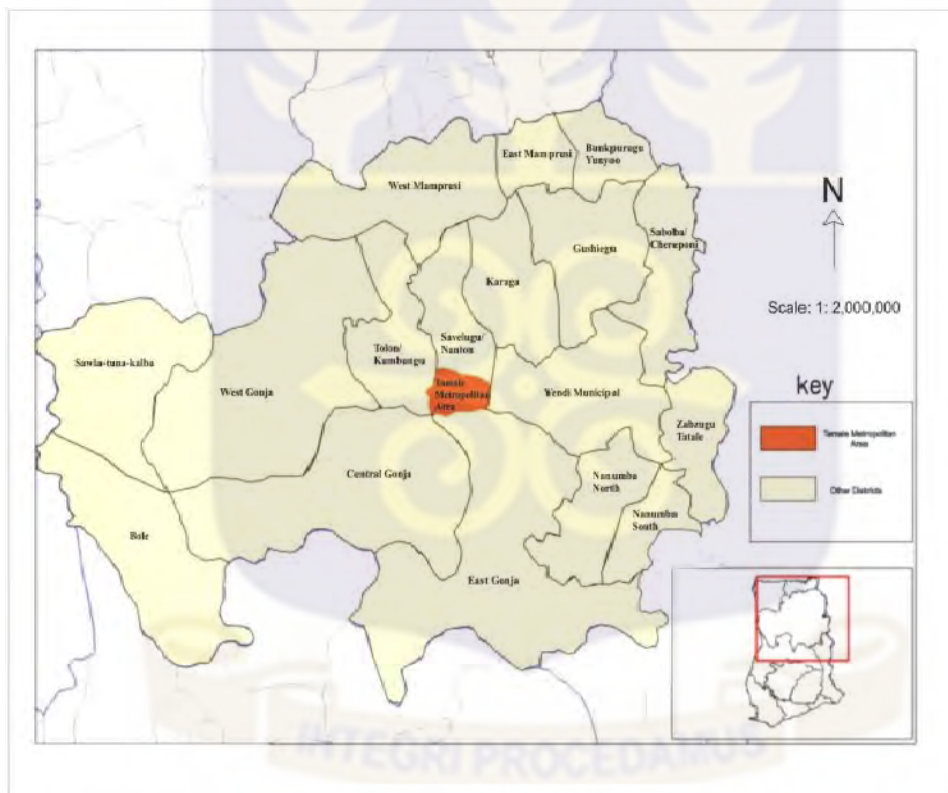


Figure 2: Geographical map of the Northern region of Ghana showing the Tamale Metropolis

Source: Ghana Statistical Service

3.2.1 Study Site

The Tamale Teaching Hospital is a 400-bed capacity facility located in the Tamale Metropolitan area. It gives clinical care to the residence of the Metropolis and its surrounding districts and also functions as a referral facility for the two Upper Regions of Ghana. The hospital runs six (6) clinical departments (Out Patients Department, Surgery, Medicine, Paediatrics, Obstetrics and Gynecology and Pharmacy) and also host one of the three Antiretroviral clinics in the metropolis where HIV and AIDS patients visit for Highly Active Anti-Retroviral Therapy.



3.3 Study Variables

Table 1: List of study variables

Variable	Operational Definition	Type of Variable	Scale of Variable
QOL	Derived from the aggregation of the 6 domains of the quality of life questionnaire	Dependent	Categorical 1. Very Poor 2. Poor 3. Neither good or bad 4. Good 5. Very good
Age	Age in years of patients	Independent	Continuous
Sex	This was defined as either male or female	Independent	Categorical (Binary) 1. Male 2. Female
Marital status	Whether married, single, Divorced or widowed	Independent	Categorical 1. single 2. married 3. Widowed 4. Divorced
Educational level	Educational status of a patient	Independent	categorical 1.No Education 2. Primary 3. Secondary 4. Tertiary
Psychology Domain	Measured from the average scores of the following: Positive feeling, Cognitive performance, Self –esteem, Body image & appearance, Negative feeling	Independent	Categorical 1. Very Poor 2. Poor 3. Neither good or bad 4. Good 5. Very good

Table 1 (cont'd): List of study variables

Variable	Operational Definition	Type of Variable	Scale of Variable
Level of independence Domain	Measured from the average scores of the following: Mobility, Daily life activities, Dependence on treatment, Working ability	Independent	Categorical 1. Very Poor 2. Poor 3. Neither good or bad 4. Good 5. Very good
Social Relationship Domain	Measured from the average scores of the following: Personal relationship, Social support, Social inclusion, Sexual activity, Physical safety	Independent	Categorical 1. Very Poor 2. Poor 3. Neither good or bad 4. Good 5. Very good
Environmental Domain	Measured from the average scores of the following: Home environment, Financial resources, Health /social care, learning opportunities, Leisure opportunities, Physical environment, transport	Independent	Categorical 1. Very Poor 2. Poor 3. Neither good or bad 4. Good 5. Very good
Spirituality, religion or Personal beliefs Domain	Measured from the average scores of the following facets: forgiveness and blame, concerns about the future, death and dying.	Independent	Categorical 1. Very Poor 2. Poor 3. Neither good or bad 4. Good 5. Very good
HB	Blood level (haemoglobin) in a patient	Independent	Continuous
CD4 ⁺	CD4 ⁺ lymphocyte count	Independent	Continuous

3.4 Sampling

3.4.1 Study population

The study population included all HIV positive patients visiting the Antiretroviral clinic of the Tamale Teaching Hospital

3.4.2 Sample size calculation

A total of 377 HIV-infected persons confirmed to be sero-positive for HIV attending the antiretroviral clinic for care and management were selected for inclusion in this study.

The minimum number (n) of records included was determined by:

$$n = \frac{Z^2 \times P \times (1 - P)}{(d^2)}$$

Where Z = 1.96 is the standard score for the confidence interval of 95%

P = Estimated proportion of patients with good quality of life

d = allowable error of 5%

Using the estimated prevalence by Marashi *et al.* (2009) who found 60% of the study population to have good quality of life

$$n = \frac{1.96^2 \times 0.6 \times 0.4}{(0.05^2)}$$

$$n = 369$$

Allowing for 5% loss of patients

$$n = (0.05 \times 369) + 369$$

$$n = 387$$

3.4.3 Sampling Method

We used simple random sampling technique for this study. Patients' information is routinely entered and stored in a database at the Antiretroviral Clinic. This provided the sampling frame; numbers were assigned to the clients in the system and Microsoft excel 2013 was used to generate 387 random numbers from the total number of 2,489 patients on their register. The first 387 random values comprised the sample size. This sampling procedure was suitable for identifying the sample size since an estimate of the sampling framework could easily be established from the database hence minimizing selection bias. We then selected the 387 patients, where a patient was not available for inclusion we choose the next number. However 377 patients out of the 387 took part in the study. This was an acceptable sample size because it exceeded the minimum sample size of 369

3.4.4 Inclusion Criteria

The study used the following inclusion criteria:

- All HIV infected adults aged ≥ 18 years seeking care at the Antiretroviral clinic of TTH
- Both inpatients and outpatients
- At all stages of HIV disease stage

3.4.5 Exclusion Criteria

- Those unable to consent to the study
- Too ill to participate in the study

- Patients who could not communicate in the study languages (English, Dagbani and Hausa)

3.5 Data collection technique and tools

In this study the principal investigator and research assistants used the English, Dagbani and Hausa versions of the culturally adopted, modified and translated version of the WHOQOL HIV-BREF questionnaire adopted from the World Health Organization. The version of the tool was determined by the language for which the participant felt comfortable to be interviewed in. This tool was administered via face to face interview. The dimensions were measured on likert scale and mainly qualitative data was collected. The tool was modified to include haemoglobin assessment and CD4 lymphocyte count so as to meet the study objectives.

The WHOQOL HIV-BREF has 31 questions with 29 facets. The two preceding questions are about how a patient rate his/her Quality of Life and how satisfied they are with their health. Items were rated on a 5 point LIKERT scale where 1 denotes low, negative perception and 5 indicates high, positive perception. Most facets scores were scaled in a positive direction with higher scores denoting higher Quality of Life. However, some seven facets such as pain and discomfort, death and dying, dependence on medication, and negative feelings (Q3, Q4, Q5, Q8, Q9, Q10, and Q31) were negatively scaled, this means higher scores for those facets do not represent higher Quality of Life. These facet scores were transformed to a positive direction by applying the formula: $(6 - x)$ where x was the facet score. The mean score of items within each domain was used to calculate the domain score.

The 29 facets is broken in to six domains. This six domains which denotes Quality of Life are the physical domain, the psychological domain, the Level of independence domain, social relationship domain, environment domain and the spiritual, religious or personal beliefs domain.

The physical domain represent an aggregate measure of the scores of four facet. These are energy and fatigue, Pain and discomfort, Sleep and rest and the extent to which the patient is bothered physically by HIV and AIDS symptoms. These facets are measured by asking patients to state their evaluation of each item on a five point Likert scale. The scale has 1 representing lowest positive feeling with 5 representing highest positive feeling. Pain and discomfort which are negatively worded feeling were later re-coded in the reverse direction. This means a low scores of 1 were later recoded to represent a higher Quality of Life.

Psychological domain is a measure of the patient's subjective evaluation of his or her Positive feeling, Cognitive performance, Self –esteem, Body image and appearance and Negative feeling. The facets are as well measured on a five-point Likert scale with negative feeling reversely recoded as in the physical domain.

Level of independence domain measures the level of support the patient requires in the performance of their daily activities. It was measured from the aggregate score of the following facets; Mobility, Daily life activities, Dependence on treatment or medication and Working ability or capacity on a five-point Likert scale. Dependence on medication was reversely re-coded so that low score will denote better Quality of Life.

Social relationship domain is measured from questions describing how respondents relates to other people in their communities, the kind of social support they get, their ability to perform sexual functions and the approval they get from their surroundings. The facets were measured by asking the patients to answer on each item on a five-point Likert scale

Environmental domain measures the contribution of the environment to the well-being the respondent. Measured on a five-point Likert scale, the facets Home environment, Financial resources, Health /social care, learning opportunities, Leisure opportunities, Physical environment and transport

Spirituality, Religion or Personal Beliefs domain defines patients' beliefs and their valuation of the purpose of life. It measures forgiveness and blame, death and dying and concerns about the future. It was also rated on a five-point Likert scale.

3. 5.1 Ethical Approval

Ethical approval was for the study was granted by the Ethical Review Committee of the Ghana Health Service with approval number: GHS-ERC: 55/12/2016. Permission was also sought from the Department of research and monitoring of the Tamale Teaching Hospital.

Informed consent was obtained from the patients and confidentiality assured before the study. They were fully informed about the purpose, procedures, risks and benefits of participating in the study. For participants who could not read, the consent form was read and thoroughly explained to them in the presence of an unbiased witness. Participants

who agreed to be part of the study were required to sign or thumbprint the consent form as a sign of their readiness to participate.

Well trained data collectors translated the questionnaires into local languages (Dagbani and Hausa) to the best of the understanding of a patient in the presence of an independent witness if the recruited patient could not read and write.

All the information obtained from this study was kept confidential and used for the purpose indicated for the study. The information was stored devoid of the names of participants, in a file, which was only accessible to the research team. The extraction of data from patients' records were done only by trained health professionals including the principal investigator who have experience in the care and management of patients and their information.

This study comes with the risk of pain associated with venipuncture procedure and psychological anxiety while waiting to receive the results of the haemoglobin and CD4⁺ lymphocyte counts. The participants were also informed of possible slight discomforts in answering some questions for which they had a choice not to respond to. Participants were informed that their involvement in the study was purely voluntary and that they may withdraw from the process at any time without attracting being victimized. Participants were not intimidated into taking part in the study and there was no direct benefit or compensation for participation.

3.5.2 Training of interviewers

The research assistants were trained a week prior to the initiation of the data collection. The training focused on ensuring that the field workers understood the objectives of the

research, were familiar with the research tools and their interpretation, and were able to perform the research tasks. Simulated practices were repeated to increase the agreement and consistency between research assistants and the trainer.

3.5.3 Pre-testing and Review of Data Collection Instrument

The data collection tool was pre-tested in the Tamale Central Hospital which have similar settings as Antiretroviral Clinic of the Tamale Teaching Hospital. The tool was pre-tested in order to ensure they reflected the local conditions, and that the questions were clear and well understood by the respondents as well as making sure that the tool was well formatted. The necessary modifications were made based on the pre-test.

3.5.4 Data Collection

Data collection was done in a quiet secluded or secure room in the unit. The interviewer introduced his/herself to the participant. The participant was told the purpose of the study, duration of the interview and his/her consent was sought before he/she was engaged in a face to face interview. Effort was made to ensure that the interviewer was confident, comfortable and knowledgeable throughout the training and practiced reading the questionnaire in advance. This was done to ensure more natural responses and hasten the establishment of rapport with the participants. We also took blood samples for haemoglobin and immunological (CD4+ lymphocyte) analysis. The interviewer thanked the participant for his/her time at the end of the process.

3.5.4.1 Sample Collection

Each participant was then asked to provide 3ml of whole blood for testing. The venipuncture was done by a trained phlebotomist and the specimen collected was used to

estimate haemoglobin and CD4 lymphocyte count. The blood specimen collected was analyzed the same day after which the specimen was discarded. The results was disclosed to the participant and the results used for both clinical and research purposes. The above was well explained to every participant and again made available to their physicians.

Blood samples were taken from the antecubital fossa of the study participants. The site for venipuncture was disinfected with 70% methylated spirit swab, a tourniquet was applied prior to the insertion of the needle. Three (3) ml of venous blood was collected from each participants and dispensed into a vacutainer tube containing Ethylene Diamine Tetra Acetic Acid (EDTA). This was used for immunological assay (CD4⁺) and haemoglobin estimation.

3.5.4.2 Immunological Assay

Absolute counts of CD4 was assayed using the system (Becton Dickenson and Company, California, U S A). The system is a fully automated instrument with reagent kits designed for computing the absolute cell counts of CD4, and CD3 T lymphocytes in whole blood.

Upon the addition of whole blood to the reagents, fluorochrome- BD FACSCOUNT labelled antibodies in the reagent binds explicitly to lymphocyte surface antigens. A fixative is added to the reagent and sample mixture and then run on the instrument. In the process, the cells interact with the laser light from the instrument, which causes the fluorochrome-labelled cells to fluoresce. The fluorescent light affords the information needed for the instrument to count the cells (Pattanapanyasat *et al.*, 2008).

Apart from the antibody reagent, the reagent tubes also have a standard number of fluorochrome-integrated reference beads. The function of the beads is to act as a

fluorescent standard for tracing the lymphocytes and also a quantitation standard for counting the cells. This process of analysis is automated. The system detects the T-lymphocyte populations and calculates the absolute counts (Pattanapanyasat *et al.*, 2008).

3.5.4.3 Haematological assay

Haemoglobin (HB) was estimated using the Mindray auto-haematology analyzer BC 3000 Plus which is an automated blood analyzer from (Mindray company, Shenzhen, China).

HB is determined by the colorimetric method. The White Blood Cells and Haemoglobin dilution according to the principle of the analyzer is sent to the WBC bath. Here it is bubble mixed with an amount of lyse, which converts haemoglobin to a complex that is measured at 525 nm. A Lead Emitting Diode mounted on one side of the bath, emits a beam of light, which passes through the sample and a 525nm wavelength filter. It is then measured by a photo-sensor mounted on the opposite side. The signal is amplified and the voltage measured and compared to the blank reference reading (readings taken when there is only diluent in the bath). The HGB according Tsuruda *et al.* (1999) is calculated per the following equation and expressed in g/dl.

$$HGB(g/dl) = constant * \log_{10} \left(\frac{Blank\ photocurrent}{sample\ photocurrent} \right)$$

3.5.5 Quality Control

Four research assistants (nurses) with experience in the health sector and who were fluent in the two common local languages of study area (Dagbani and Hausa) were recruited

and trained. The training focused on understanding the objectives of the study, the information the questionnaire intend to draw from the participants and how to administer the questionnaire devoid of leading subjects to responses. Ethical issues were discussed as well. This was centered on the courtesy and respect for the rights of participants and the confidentiality and privacy of their responses and information from retrieved from their medical records.

During the data collection, the principal investigator supervised the research assistants and the data collected was randomly crosschecked from the participants for correctness. Double entry of data into Microsoft excel 2013 version was done by two data entry clerks independent. Discrepancies were resolved by referring to the original data collection tools. Data validation was ensured during the data entry process by using validation programs whilst creating the data entry template.

3.6 Statistical Analysis

The Quality of Life of the study participants was assessed using the WHOQOL-HIV BREF. The facet scores ranged from 1 to 5, with 1= Very poor, 2= Poor, 3= Neither poor nor good, 4=Good and 5=Very good Quality of life. The facet scores are combined to gives domain scores which range from 4 to 20, with 4 denoting very poor Quality of Life and 20, very good quality of life. The average Domain score is then computed to give the overall Quality of Life.

Domain scores of the WHOQOL-HIV BREF were calculated from the average score of facets in that. Average facet scores were then multiplied by 4 in order to make domain scores comparable to other domains and also with the tallies in the full version of the

World Health Organization Quality of Life instrument (WHOQOL-100) as shown in Table 2.

Categorical and continuous variables were displayed as percentages and means \pm standard deviation (S.D) respectively. The student's t test was used to assess differences between means of individual variables and differences in the mean scores of various domains of the WHOQOL-HIV BREF. Differences between categorical variables were analyzed by Chi-square test with Fisher's exact correction applied as appropriate. Differences between ≥ 3 groups was analyzed using analysis of variance (ANOVA).

We used Spearman's correlation co-efficient to show the relationship between the domains of quality of life. We also calculated the Cronbach's alpha to show the internal consistency and reliability of the domains of quality of life. All p-values were two tailed and values <0.05 were considered to be statistically significant. All statistical analyses were done using Microsoft excel and STATA Version 14.

Table 2: Domain scoring format for WHOQOL-HIV BREF

Domain 1 -Physical	$(Q3 + Q4 + Q14 + Q21)/4 * 4$
Domain 2 -Psychological	$“(Q6 + Q11 + Q15 + Q24 + Q31)/5 *4$
Domain 3-Level of Independence	$(Q5 + Q22 + Q23 + Q20)/4 * 4$
Domain 4- Social Relationship	$(Q27 +Q26 + Q25 + Q17)/4*4$
Domain 5- Environmental	$(Q12 + Q13 + Q16 + Q18 + Q19 + Q28 + Q29 + Q30)/8 *4$
Domain6- Spirituality/religious/Beliefs	$(Q7 + Q8 + Q9+ Q10)/4 *4$

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic characteristics

This study was conducted in the antiretroviral clinic of Tamale Teaching Hospital (TTH) in the Northern Region. The respondents were adult HIV positive patients receiving treatment at the clinic who were randomly selected from the patient register by generating random numbers using Microsoft Excel 2013.

A total of 377 study subjects were recruited in this study. Of this number 290 (76.9%) of the study population were females. The males were significantly older than the female counter (45.51yrs vs 38.09yrs $p < 0.0001$) and majority of the study subjects (68.88%) were within the age bracket of 25-44years.

Majority of the participants (63.13%) were married, 13.53% were single, and 13.27% were divorced with the remaining (6.90%) widowed. About a third of the participants 140 (37.14%) had no formal education and only 55 (14.59%) had tertiary education. Most of the participants 226 (59.95%) worked in the informal sector, 18.83% worked in the formal sector while 69 (18.30%) were currently unemployed as shown in Table 3.

Table 3: Socio-demographic characteristic of the study population

Parameter	Total N (%) 377	Male N (%) (87)	Female N (%) (290)	P-value
Age (mean) yrs	39.80 ± 9.70	45.51 ± 11.15	38.09 ± 8.62	<0.0001
Age group				
18 – 24	9 (2.38)	1 (11.11)	8 (88.89)	0.1406
25 - 34	121 (32.01)	12 (9.92)	109 (90.08)	
35 - 44	139 (36.87)	31 (22.30)	108 (77.70)	
45 - 54	82 (21.75)	27 (32.93)	55 (67.07)	
55 - 64	15 (3.98)	6 (40.00)	9 (60.00)	
>64	11 (2.92)	10 (90.91)	1 (9.09)	
Marital Status				
Married	238 (63.13)	63 (26.47)	175 (73.53)	0.2361
Single	51 (13.53)	13 (25.49)	38 (74.51)	
Divorced	50 (13.27)	6 (12.00)	44 (88.00)	
Widowed	26 (6.90)	1 (3.85)	25 (96.15)	
Non-Response	12 (3.18)	5 (41.67)	7 (58.33)	
Educational Status				
No Education	140 (37.14)	29 (20.71)	111 (79.29)	0.0477
Basic Education	114 (30.24)	14 (12.28)	100 (87.72)	
Secondary Education	59 (15.65)	16 (27.19)	43 (72.88)	
Tertiary Education	55 (14.59)	24 (43.64)	31 (56.36)	
Non-Response	9 (2.39)	4 (44.44)	5 (55.56)	
Employment Status				
Unemployed	69 (18.30)	25 (36.23)	47 (63.77)	0.2428
Informal	226 (59.95)	34 (15.49)	188 (84.51)	
Formal	71 (18.83)	22 (30.98)	49 (69.01)	
Non-Response	11 (2.92)	5 (45.45)	6 (54.55)	

Data is presented as No. (%). P-values are generated by comparing male and female subjects using fisher's exact test and chi-square test where appropriate.

4.2 Quality of Life

Table 4 shows the mean facet score for Quality of life using the WHOQOL-HIV BREF, the highest mean facet score in Domain 1 was recorded in the Sleep and rest facet (3.89 ± 0.95) while the symptoms of HIV and AIDS facet recorded the lowest mean score (3.07 ± 0.95). The males and females, however, showed comparable mean scores in all the facets except in the energy and fatigue facet where the females recorded significantly higher mean facet scores compared to the males (3.68 ± 0.90 vs 3.34 ± 1.03 , P-value = 0.0039)

The highest mean facet score in Domain 2 was recorded in the cognitive ability facet (3.45 ± 0.82) while the lowest was in positive feeling facet (2.92 ± 0.90). Apart from the cognitive ability facet where the females showed significantly higher mean scores than the males (3.53 ± 0.80 vs 3.18 ± 0.86 , P-value, 0.0005), all other facet scores were comparable between males and females.

In Domain 3, the highest mean facet score was recorded in the work capacity facet (3.66 ± 0.98), while the lowest score was recorded in the dependence on medication facet (2.10 ± 0.90). While all other facet scores were comparable for males and females, the females recorded significantly higher mean facet scores in work capacity compared to the males (3.73 ± 0.85 vs 3.41 ± 1.30 , P-value = 0.0085)

The highest mean facet score in Domain 4 was in the Social Inclusion facet (2.54 ± 0.73) while the lowest was in the social support facet (2.34 ± 0.79). No significant statistical difference was observed when facet scores for males and females were compared.

In Domain 5, the highest mean facet score was recorded in the access to health care facet (4.24 ± 0.78) while the lowest was recorded in the participation in leisure activities facet (2.83 ± 1.21). The males, however, reported higher scores participation in leisure activities facet compared to the females (2.62 ± 1.23 vs 2.33 ± 1.02 , P-value = 0.0261), all other facet scores in this Domain were comparable between males and females.

The highest mean score in Domain 6 was recorded in the meaningful life facet (3.08 ± 0.92) while the lowest was recorded in the concerns about the future facet (2.47 ± 0.78). The female participant recorded significantly higher scores in the forgiveness and blame facet compared to the males (2.83 ± 0.91 vs 2.59 ± 0.95 , P-Value= 0.0273).

In the general questions on perception on Quality of Life and satisfaction with one's Health, the female participants generally recorded higher mean scores in both questions with the difference in mean scores about perception of Quality of Life being statistically significant compared to the males (3.59 ± 0.80 vs 3.38 ± 0.98 , P - value = 0.0420).

The highest facet score was recorded in the access to health care facet for both males females (4.23 ± 0.66 and 4.24 ± 0.81).

Table 4: Facet scores of Quality of Life by gender

Facet	Total (Mean ± SD)	Male (Mean ± SD)	Female (Mean ± SD)	P-value
Domain 1 (Physical)				
Pain and discomfort	3.26 ± 0.99	3.17 ± 0.94	3.29 ± 1.00	0.3464
Symptom of HIV	3.07 ± 0.95	2.91 ± 1.01	3.11 ± 0.93	0.0773
Energy and fatigue	3.60 ± 0.94	3.34 ± 1.03	3.68 ± 0.90	0.0039
Sleep and rest	3.89 ± 0.95	3.74 ± 1.02	3.93 ± 0.92	0.0928
Domain 2 (Psychological)				
Positive feeling	2.92 ± 0.90	2.98 ± 1.02	2.90 ± 0.86	0.5038
Cognitive Ability	3.45 ± 0.82	3.18 ± 0.86	3.53 ± 0.80	0.0005
Body image and appearance	3.12 ± 0.92	3.09 ± 1.05	3.13 ± 0.87	0.7045
Self esteem	3.16 ± 0.83	3.09 ± 0.88	3.19 ± 0.89	0.3524
Negative feeling	2.85 ± 0.85	2.78 ± 0.79	2.88 ± 0.86	0.3644
Domain 3 (Level of Independence)				
Dependence on medication	2.10 ± 0.90	2.00 ± 1.00	2.12 ± 0.80	0.2335
Mobility	3.48 ± 0.91	3.61 ± 1.04	3.44 ± 0.86	0.1218
Activities of daily living	3.56 ± 0.98	3.41 ± 1.11	3.61 ± 0.94	0.1089
Work capacity	3.66 ± 0.98	3.41 ± 1.30	3.73 ± 0.85	0.0085
Domain 4 (Social Relationship)				
Social inclusion	2.54 ± 0.73	2.61 ± 0.81	2.51 ± 0.70	0.2849
Personal relationship	2.53 ± 0.82	2.55 ± 0.94	2.52 ± 0.78	0.7560
Sexual Activity	2.49 ± 1.17	2.47 ± 1.16	2.49 ± 1.18	0.8980
Social support	2.34 ± 0.79	2.21 ± 0.78	2.38 ± 0.79	0.0753
Domain 5 (Environment)				
Physical Safety and security	3.43 ± 0.85	3.51 ± 0.83	3.41 ± 0.86	0.3600
Physical environment	3.64 ± 0.84	3.61 ± 0.83	3.66 ± 0.84	0.6544
Financial resources	2.99 ± 1.25	3.07 ± 1.49	2.96 ± 1.17	0.4862
Opportunities for new information	2.83 ± 1.21	3.00 ± 1.43	2.78 ± 1.13	0.1361

Data is presented as mean ± SD. P-values are obtained when the domain scores of male subjects were compared to the female subjects using student t-test. Facet scores range from 1-5, with 1=very poor, 2=poor, 3=neither poor nor good, 4=good and 5=very good Quality of life

Table 4(*cont'd*) Facet scores of Quality of Life by gender

Facet	Total (Mean \pm SD)	Male (Mean \pm SD)	Female (Mean \pm SD)	P-value
Participation in leisure activities	2.40 \pm 1.08	2.62 \pm 1.23	2.33 \pm 1.02	0.0261
Home environment	3.28 \pm 0.99	3.20 \pm 1.07	3.31 \pm 0.97	0.3587
Access to health care	4.24 \pm 0.78	4.23 \pm 0.66	4.24 \pm 0.81	0.9328
Transport	3.51 \pm 1.04	3.57 \pm 1.16	3.49 \pm 1.01	0.4879
Domain 6 (Spirituality/Religious/Personal Beliefs)				
Meaningful life	3.08 \pm 0.92	3.18 \pm 0.92	3.05 \pm 0.92	0.2278
Forgiveness and Blame	2.78 \pm 0.92	2.59 \pm 0.95	2.83 \pm 0.91	0.0273
Concerns about the future	2.47 \pm 0.78	2.51 \pm 0.94	2.46 \pm 0.73	0.6469
Death and dying	2.49 \pm 0.85	2.51 \pm 0.89	2.49 \pm 0.84	0.8899
General Question				
Quality of life	3.54 \pm 0.85	3.38 \pm 0.98	3.59 \pm 0.80	0.0420
Satisfaction with Health	3.40 \pm 0.83	3.33 \pm 0.84	3.42 \pm 0.82	0.3693

Data is presented as mean \pm SD. P-values are obtained when the domain scores of male subjects were compared to the female subjects using student t-test. Facet scores range from 1-5, with 1=very poor, 2=poor, 3=neither poor nor good, 4=good and 5=very good Quality of life

From figure 2, the highest domain scores of Quality of Life was recorded in the physical domain (13.81), with the lowest mean score observed in the social relationship domain (9.89). The overall QOL in the study population was 12.15.



Figure 3: Domain scores for Quality of Life

From Fig 4, the females showed higher scores in all the domains except in the environment domains where the males had a higher average domain score. The females again showed better scores in the overall Quality of Life compared to the males. No statistically significant differences were however observed in the mean Quality of Life scores for the all the domains as well as the overall Quality of Life when male and female participants were compared.

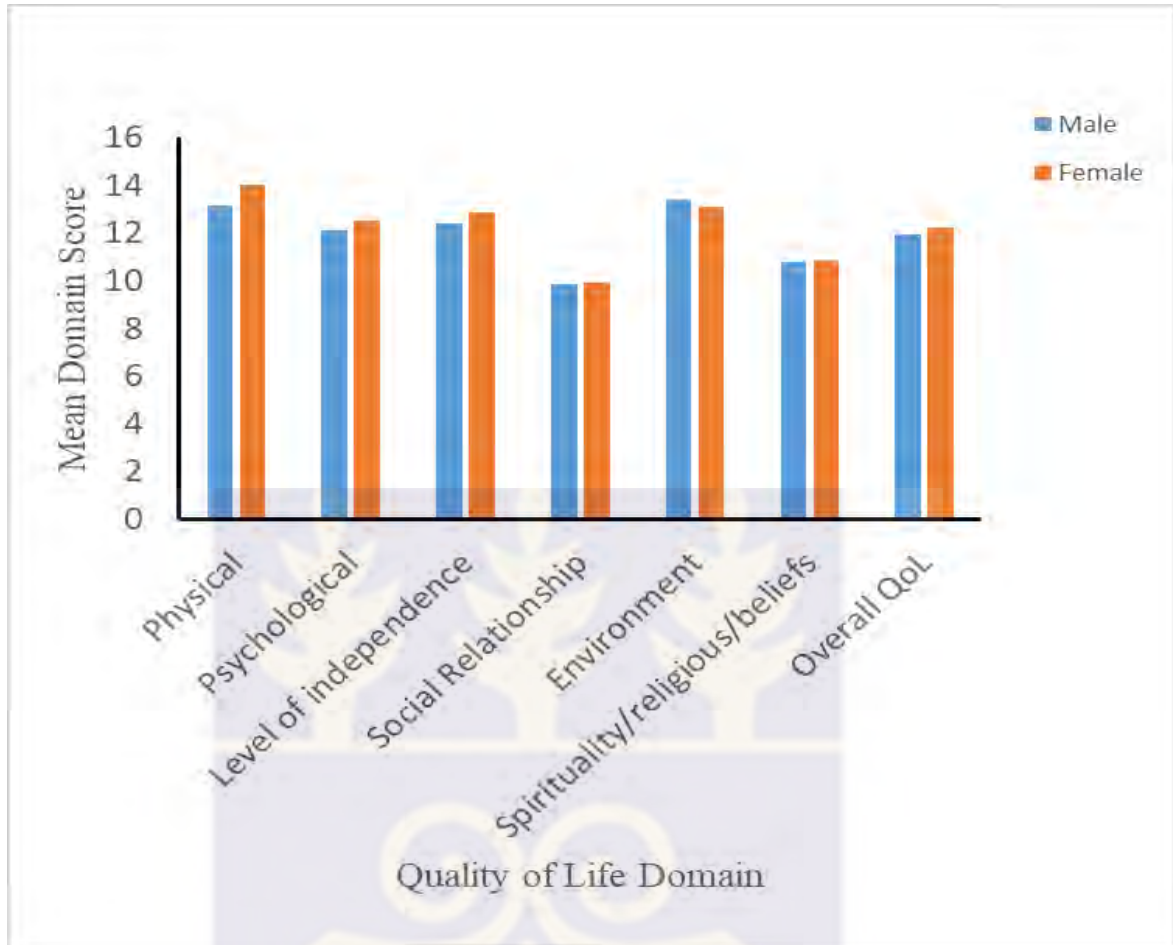


Figure 4: Domain scores of Quality of Life according to gender

From Table 5, the highest domain scores in both the physical and psychological domains were recorded by participants in age group 18-24years with scores of (15.78 ± 0.93) and (12.89 ± 1.09) respectively, while the lowest score in the physical domain was recorded by those in age group 65-74years (12.82 ± 1.86) and that in psychological domain was recorded in by age group 35 – 44 years with a score of (12.21 ± 1.11) . No significant statistical difference was recorded in the mean domain scores for the various age categories in the physical and psychological domains

Again age group 15 -24 years recorded the highest score (13.78 ± 2.83) in the level of independence domain, while the age group 65 – 74 years recorded the lowest mean score (12.36 ± 3.04) in this domain, with no significant statistically difference recorded within age groups in this domain. The social relationship domain recorded its highest mean score (11.00 ± 1.47) among participants in the age group 65 – 74 years while those in the age group 18 – 24 years recorded the lowest mean score (7.89 ± 0.99) . The differences in domain scores among the various age groups were significant in this domain with a p-value of 0.0071.

Study participants within the age group 18-24years recorded the highest mean score (14.28 ± 2.59) in the environment domain, with those in the age group 35-44 years recording the lowest mean score (12.90 ± 2.32) in this domain. No significant statistical difference was observed among the age groups in this domain.

The elderly study participants (age group 65 – 74 years) recorded the highest score (12.91 ± 1.34) in the spirituality/religious/belief domain while the very young participants

recorded the lowest mean score (10.33 ± 0.92) in this domain. No statistically significant difference was however recorded when the various age groups were compared.

The age group of 65-74 years recorded the highest mean score (12.63 ± 1.94) for overall Quality of Life with those in age group 35-44years recording the lowest mean score (11.89 ± 1.52) in overall Quality of Life. No significant statistical differences were observed when the mean score for overall Quality of Life was compared among the various age groups



Table 5: Domain Scores of Quality of Life Stratified by Age Group

Domain	Age Group						P-value
	(18 -24)yrs (n = 9)	(25 - 34)yrs (n = 121)	(35 – 44)yrs (n = 139)	(45 -54)yrs (n = 82)	(55 – 64)yrs (n = 15)	(65 - 74)yrs (n = 11)	
Physical	15.78 ± 0.93	14.12 ± 1.55	13.45 ± 1.33	13.82 ± 1.54	14.13 ± 1.78	12.82 ± 1.86	0.1897
Psychological	12.89 ± 1.09	12.65 ± 0.98	12.21 ± 1.11	12.27 ± 0.90	12.69 ± 1.44	12.65 ± 1.42	0.9337
Level of Independence	13.78 ± 2.83	12.93 ± 3.02	12.77 ± 2.87	12.52 ± 3.08	13.07 ± 2.85	12.36 ± 3.04	0.9876
Social Relationship	7.89 ± 0.99	10.36 ± 0.51	9.59 ± 0.50	9.70 ± 0.39	10.27 ± 1.47	11.00 ± 1.47	0.0071
Environment	14.28 ± 2.59	13.29 ± 2.20	12.90 ± 2.32	13.06 ± 2.24	13.67 ± 2.77	14.05 ± 2.53	0.8430
Spirituality/Religious/Beliefs	10.33 ± 0.92	11.31 ± 1.27	10.40 ± 0.97	10.63 ± 1.64	10.40 ± 1.13	12.91 ± 1.34	0.0596
Overall QoL	12.49 ± 1.56	12.44 ± 1.59	11.89 ± 1.52	12.00 ± 1.63	12.37 ± 1.91	12.63 ± 1.94	0.9730

P-values are generated using one- way ANOVA, QoL: Quality of Life. Domain scores are scaled from 4 – 20, with 4 denoting very poor Quality of Life and 20 representing very Good Quality of Life

Table 6 shows the comparison of mean Quality of Life domain scores according to marital status. The study participants who were divorced recorded the highest mean scores (14.70 ± 0.77) in the physical domain while those widowed recorded the lowest mean domain scores (11.23 ± 1.76). There was significant statistical difference when the mean scores in the physical domain were compared among the various marital status groups, (p -value=0.0289).

The married participants recorded the highest mean Quality of Life scores in the psychological, social relationship, environmental and religious beliefs domains and also the overall quality of life with scores of 12.74 ± 1.00 , 10.56 ± 1.01 , 13.47 ± 2.29 , 10.98 ± 1.19 , 12.42 ± 1.65 respectively. In this same domains, the widowed participants recorded the lowest mean domain scores with scores of 10.34 ± 0.83 , 8.08 ± 2.14 , 11.54 ± 2.35 , 9.12 ± 1.55 , 10.14 ± 1.86 respectively. No significant statistical differences were observed when the groups in this domains were compared except in the psychological domain which recorded significant statistical differences (P -value= 0.0139).

The single, married and divorced participants recorded their highest mean score in the physical domain, while the widowed participants recorded their highest mean score in the environmental domain. All the groups recorded their lowest mean scores in the social relationship domain. The widowed participants, however, recorded the least mean scores in all the six domains and also the overall quality of life as shown in Table 6.

Table 6: Domain Scores of Quality of Life According to Marital Status

Domain	Single (Mean ± SD) (n = 50)	Married (Mean ± SD) (n = 234)	Divorced (Mean ± SD) (n = 49)	Widowed (Mean ± SD) (n = 25)	P-value
Physical	14.24 ± 1.67	13.82 ± 1.60	14.70 ± 0.77	11.23 ± 1.76	0.0289
Psychological	12.09 ± 1.07	12.74 ± 1.00	12.24 ± 1.30	10.34 ± 0.83	0.0139
Level of independence	13.16 ± 4.02	12.97 ± 2.84	12.76 ± 2.77	10.58 ± 2.53	0.6247
Social Relationship	9.33 ± 1.02	10.56 ± 1.01	8.38 ± 2.03	8.08 ± 2.14	0.1903
Environment	13.53 ± 1.94	13.47 ± 2.29	12.37 ± 2.47	11.54 ± 2.35	0.2577
Spirituality /religious/beliefs	10.89 ± 1.46	10.98 ± 1.19	10.70 ± 1.03	9.12 ± 1.55	0.2072
Overall QoL	12.20 ± 1.86	12.42 ± 1.65	11.85 ± 1.73	10.14 ± 1.86	0.1142

P-values are generated using one- way ANOVA, QoL: Quality of Life. Domain scores are scaled from 4 – 20, with 4 representing very poor Quality of Life and 20 representing very Good Quality of Life.

From Table 7, study participants with secondary education had the highest mean domain scores in the physical, level of independence, psychological and social relationship domains with mean domain scores of 14.93 ± 1.48 , 13.27 ± 1.02 , 13.98 ± 3.11 and 10.56 ± 0.76 respectively. Study participants with basic education, however, recorded the lowest domain scores in these same domains with domain scores of 13.09 ± 1.76 , 11.82 ± 1.24 , 12.07 ± 2.85 and 9.54 ± 0.33 respectively.

Those with tertiary education recorded the highest domain scores in the environment, spirituality/religion/beliefs and also in the overall Quality of Life with scores of 15.76 ± 1.31 , 11.85 ± 1.56 and 13.24 ± 1.72 respectively. The lowest mean score in the environment domain was recorded by those with no formal education while those with basic education had lowest mean scores in the spirituality/religion/beliefs and overall Quality of Life.

For participants with tertiary education, their highest mean domain score was in the environment domain, those with secondary education, basic education and no education had their highest mean score in the physical domain. All the groups irrespective of their educational status had their lowest mean score in the social relationship domain. Significant statistical differences in domain scores in the groups were however observed for only the environmental domain, p -value = 0.0079 as shown in Table 7.

Table 7: Domain scores of Quality of Life stratified by educational status

Domain	No Education (Mean ± SD) (n = 140)	Basic Education (Mean ± SD) (n = 114)	Secondary Education (Mean ± SD) (n =59)	Tertiary Education (Mean ± SD) (n =55)	P- Value
Physical	13.74 ± 1.19	13.09 ± 1.76	14.93 ± 1.48	14.53 ± 1.69	0.3754
Psychological	12.26 ± 0.82	11.82 ± 1.24	13.27 ± 1.02	13.15 ± 0.95	0.1103
Level of independence	12.56 ± 2.61	12.07 ± 2.85	13.98 ± 3.11	13.67 ± 4.08	0.8121
Social Relationship	9.76 ± 0.50	9.54 ± 0.33	10.56 ± 0.76	10.45 ± 0.74	0.0901
Environment	12.19 ± 2.78	12.51 ± 2.49	14.47 ± 1.81	15.76 ± 1.31	0.0079
Spirituality/ religious/beliefs	10.56 ± 1.32	10.55 ± 0.87	10.78 ± 1.39	11.85±1.56	0.4782
Overall QoL	11.84 ± 1.54	11.59 ± 1.59	13.00 ± 1.59	13.24±1.72	0.2532

P-values are generated using one- way ANOVA, QoL: Quality of Life. Domain scores are scaled from 4 – 20, with 4 representing very poor Quality of Life and 20 representing very Good Quality of Life.

From Table 8, study participants who are in formal employment recorded higher domain scores in all six domains of Quality of Life and also in all the overall QoL compared to those unemployed and counterparts in informal employment. The unemployed participants, however, recorded lowest mean domain scores in all the six domains compared to the others. Significantly statistical differences were recorded in mean domain scores in the psychological and environmental domains. There were no statistically significant disparities within groups with regards to the overall Quality of Life.

Those in formal employment recorded their highest mean domain score in the environment domain, while those in informal employment and the unemployed had their highest mean domain score in the physical domain. All the groups, however, recorded their lowest mean scores in the social relationship domain.

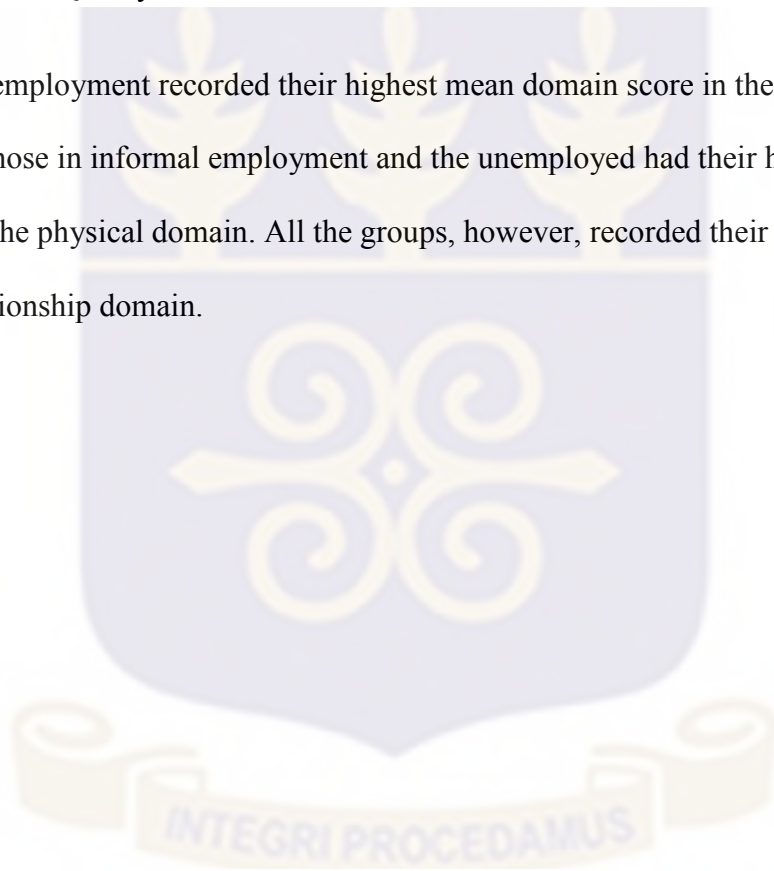


Table 8: Domain scores of Quality of Life according to employment status

Domain	Formal Employment (Mean ± SD) (n = 65)	Informal Employment (Mean ± SD) (n = 222)	Unemployed (Mean ± SD) (n = 67)	P-value
Physical	14.91 ± 1.71	13.82 ± 1.47	12.90 ± 1.27	0.2177
Psychological	13.27 ± 0.97	12.43 ± 0.97	11.41 ± 1.02	0.0359
Level of Independence	13.77 ± 3.94	12.96 ± 2.92	11.41 ± 2.32	0.576
Social Relationship	10.15 ± 0.68	10.03 ± 0.37	9.29 ± 0.75	0.1664
Environment	15.63 ± 1.26	13.01 ± 2.51	11.49 ± 2.73	0.0051
Spirituality/Religious/Beliefs	11.80 ± 1.25	10.73 ± 1.35	9.69 ± 0.61	0.0762
Overall QoL	13.26 ± 1.65	12.16 ± 1.60	11.03 ± 1.45	0.0938

P-values are calculated using one- way ANOVA, QoL: Quality of Life. Domain scores are scaled from 4 – 20, with 4 representing very poor Quality of Life and 20 representing very Good Quality of Life

From Table 9, the participants were classified based on the severity of the disease using the World Health Organization's criteria for staging HIV disease using the CD4 lymphocyte count. Patients with CD4 lymphocyte cell count ≥ 500 are classified as stage 1, CD4 lymphocyte cell count 350 – 499 cell/mm³ as stage 2, those CD4 lymphocyte cell count 200 - 349 cell/mm³ as stage 3 and CD4 lymphocyte cell count ≤ 200 cell/mm³ as stage 4.

Participants with CD4 counts ≥ 500 cell/mm³, which is the first stage of HIV and AIDS disease had higher mean scores in all the six Quality of Life domains and also in the overall Quality of Life score. Those with stage 4 disease (CD4 < 200 cell/mm³) had the poorest domain scores in all six domains and also in the overall Quality of Life compared to the other stages. Statistically significant differences in mean domain scores within the 4 stages of HIV and AIDS disease was recorded in the physical, level of independence, psychological, social relationship domains and also in the overall Quality of Life with p-values of 0.0223, 0.0068, 0.0106 and 0.0418 respectively.

The highest mean score for those with stage 1, stage 2 and stage 2 disease was in the physical domain and that of those with stage 3 disease was in the environment domain. All three stages of disease, however, recorded their lowest score in the social relationship domain.

Table 9: Domain scores of Quality of life stratified by stage of disease

DOMAIN	CD4+ count, cell/mm3				P-value
	Stage 1(≥ 500) (Mean \pm SD) (n = 150)	Stage2(250-499) (Mean \pm SD) (n = 147)	Stage 3(200-349) (Mean \pm SD) (n = 71)	Stage 4(<200) (Mean \pm SD) (n = 61)	
Physical	15.43 \pm 1.31	13.29 \pm 1.59	12.99 \pm 1.41	11.25 \pm 1.98	0.0223
Psychological	13.62 \pm 1.26	11.86 \pm 1.25	11.55 \pm 0.87	10.95 \pm 0.78	0.0068
Level of independence	13.89 \pm 3.11	12.51 \pm 2.84	12.13 \pm 3.03	10.85 \pm 2.40	0.5355
Social Relationship	10.57 \pm 0.55	9.47 \pm 0.24	9.09 \pm 0.36	9.36 \pm 0.81	0.0106
Environment	14.06 \pm 2.20	12.71 \pm 2.13	11.99 \pm 2.31	12.16 \pm 2.25	0.2548
Spirituality/religious/beliefs	11.38 \pm 1.17	10.46 \pm 1.47	10.19 \pm 1.07	10.44 \pm 1.49	0.6058
Overall QoL	13.16 \pm 1.82	11.71 \pm 1.59	11.32 \pm 1.51	10.83 \pm 0.92	0.0418

P-values are generated using one- way ANOVA, QoL: Quality of Life. Domain scores are scaled from 4 – 20, with 4 signifying very poor Quality of Life and 20 representing very Good Quality of Life

From Table 10, using the WHO/ACTG criteria for classifying anaemia, the participants were grouped into two; the anaemia group ($Hb \leq 10.5g/dl$) and the non-anaemic group ($Hb > 10.5g/dl$).

The non-anaemic ($Hb > 10.5g/dl$) study participants had higher domain scores in all six domains and also in the overall Quality of Life compared to their counterparts with anaemia. Statistical significant differences in the scores were however observed for only the social relationship and physical domains with P-values of 0.0408 and 0.0325 respectively.

The highest mean scores both the anaemic and non-anaemic groups were recorded in the physical domains with mean domain scores of 12.81 ± 1.20 and 14.34 ± 1.22 respectively. The lowest mean domains scores for both groups was in the social relationship domain as shown in Table 10.

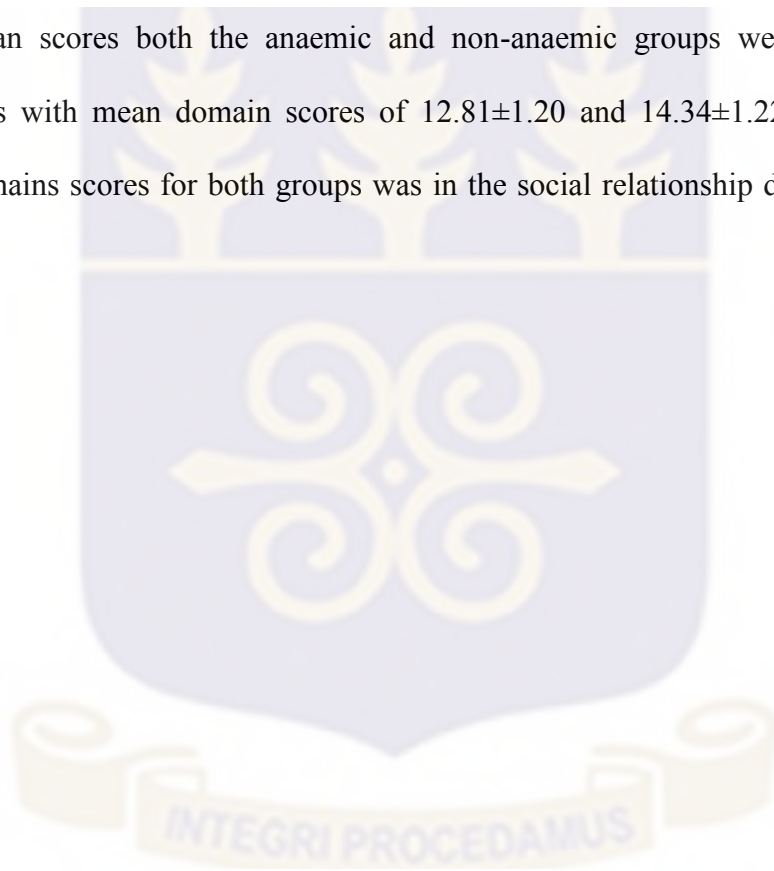


Table 10: Domain scores of Quality of Life according to anaemia status

DOMAIN	Anaemic (Hb\leq10.5g/dl) (Mean \pm SD) (n = 69)	Non-anaemic (Hb$>$10.5g/dl) (Mean \pm SD) (n = 308)	P-value
Physical	12.81 \pm 1.20	14.34 \pm 1.22	0.0408
Psychological	11.77 \pm 0.69	12.56 \pm 1.04	0.0431
Level of independence	11.88 \pm 2.52	12.99 \pm 3.05	0.5954
Social Relationship	9.02 \pm 0.57	10.02 \pm 0.44	0.0325
Environment	12.80 \pm 2.14	13.24 \pm 2.27	0.7020
Spirituality/religious/beliefs	10.41 \pm 1.53	10.92 \pm 1.05	0.6018
Overall QoL	11.33 \pm 1.37	12.34 \pm 1.59	0.0316

P-values are generated when the quality of life domains for participants with anaemia (Hb \leq 10.5) are compared to those are not anaemic (Hb $>$ 10.5) employing unpaired t test. Domain scores are scaled from 4 – 20, with 4 representing very poor Quality of Life and 20 representing very Good Quality of Life

Table 11 shows the correlation co-efficient to show how the six domains of Quality of Life relates to each other. The inter-domain correlation showed significant associations between all domains of the Quality of Life tool. Strong correlation was however recorded between Physical domains and the Level of Independence domain ($r = 0.849$, $p < 0.001$), followed by ($r = 0.779$, $p < 0.001$). The weakest correlation was recorded between Social Relationship domains and Physical domains ($r = 0.490$, $p < 0.001$).



Table 11: Spearman correlation matrix for domains of the WHOQOL- HIV BREF tool

Domain	Physical	Psychological	Level of Independence	Social Relationship	Environment	Spirituality
Physical	1					
Psychological	0.770*	1				
Level of Independence	0.849*	0.745*	1			
Social Relationship	0.490*	0.625*	0.524*	1		
Environment	0.639*	0.712*	0.678*	0.548*	1	
Spirituality	0.510*	0.664*	0.515*	0.547*	0.507*	1

Note: * P< 0.0001, correlation co-efficient assessed using Spearman's Rank correlation

Table 12 shows the Spearman's rank correlation between each QoL-HIV domain with the overall Quality of Life, perception of Quality of Life and self-evaluated Health status and the internal Consistency validity of the instrument. The Cronbach's alpha range between 0.6893 and 0.5398 across the six domains indicating a good internal consistency reliability. The scores for all the Quality of life domains correlated positively and significantly with the overall Quality of Life, perceived Quality of Life and self- evaluated health status. Spearman's rho (ρ) range from, 0.9030 – 0.7177, 0.6816 – 0.4450 and 0.6924 – 0.3368 for overall Quality of Life, perceived Quality of Life and self- evaluated health status respectively among the six Domains of Quality of Life.

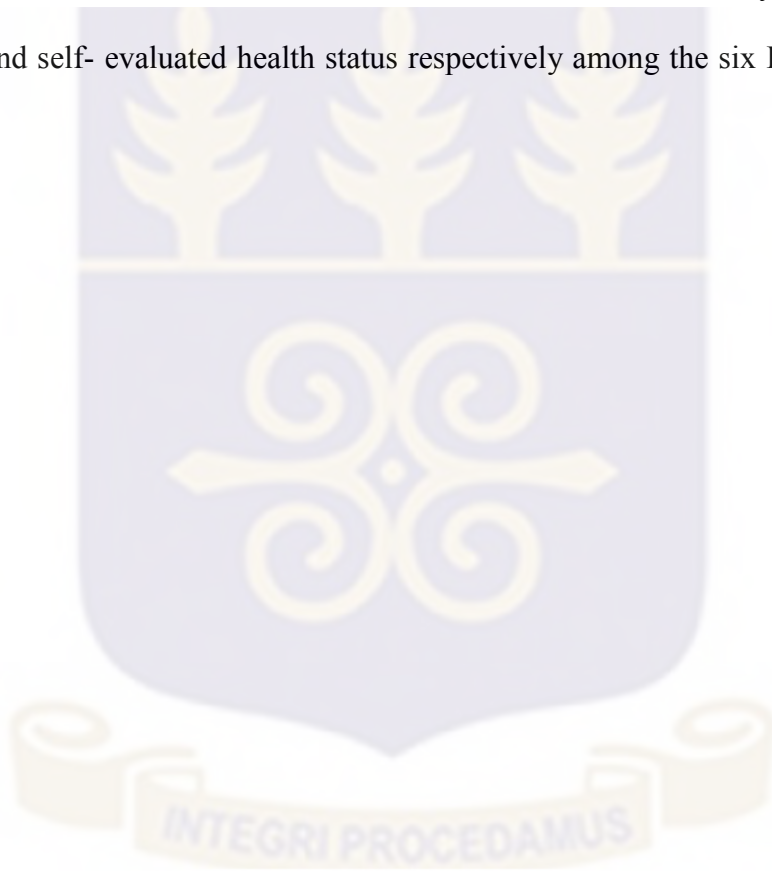


Table 12: Spearman's rank correlation between QoL domains and health status measures and Internal consistency reliability of the instrument

Domain	Overall Quality of Life[†]	Perception of Quality of Life[#]	Self-evaluated Health Status[#]	Cronbach's alpha
Physical	0.8691*	0.6816*	0.6924*	0.6391
Psychological	0.9030*	0.6592*	0.6334*	0.6893
Level of independence	0.8785*	0.6430*	0.6147*	0.6398
Social Relationship	0.7276*	0.4615*	0.3368*	0.5398
Environment	0.8348*	0.5866*	0.4501*	0.5684
Spirituality/religious/beliefs	0.7177*	0.4450*	0.4375*	0.5929

Correlation co-efficient assessed by spearman's correlation. Note: * P< 0.0001, † =Domain calculated QoL, # = Individual perceived status from general Questions

CHAPTER 5

5.0 DISCUSSION

5.1 Socio-demographic characteristics

In this cross sectional study, we evaluate the Quality of Life among HIV and AIDS patients in the Tamale Metropolis of the Northern Region of Ghana. We were particularly interested in determining socio-demographic factors that influence the Quality of Life among HIV infected persons and also the influence of clinical factors (anaemia and CD4 lymphocyte count) on their Quality of Life domains.

Approximately 77% of the study participants were female. This finding supports a skewed prevalence and severity of HIV and AIDS in females compared to males (UNICEF and WHO, 2011). This is consistent with several other studies from Sub-Saharan Africa which found majority of their study subjects to be female (Abasiubong *et al.*, 2010; Robberstad and Olsen, 2010; Akinboro *et al.*, 2014).

Our study also reported the average age of male subjects to be significantly higher compared to their female counterparts. This supports an early an early onset of HIV in Ghanaian females compared to males, as reported by Owiredu *et al.* (2011).

Our study participants were largely between the ages of 25 to 44 years. This is the sexually active age group. As reported by the Ghana AIDS Commission (2012), sexual contacts account for about 75 -80% of all HIV infections in the country.

5.2 Quality of Life

Our study reported the highest facet score in the accessibility to health care facet with the poorest score in the dependence on medication daily activities facet. This indicates the effectiveness of the free antiretroviral treatment campaign in the Tamale Metropolis specifically and the Northern Region at large. Marashi *et al.* (2009), in India also reported highest facet score in the accessibility to health care facet but reported the lowest score in the thinking about death and dying facet.

From the present study, Quality of Life scores was highest in the Physical domain which measures the presence of pain and discomfort, energy and fatigue, dependence on medication mobility, activities of daily sleep and rest and perceived working capacity. This was followed by the Environmental and domain which measures patient's financial status, patient's freedom, quality and accessibility of health and social care and quality of the home environment.

This finding is similar to studies by Marashi *et al.* (2009) but is opposed to the findings by (Fatiregun *et al.*, 2009; Folasire *et al.*, 2012) in similar studies conducted in different Nigerian States in which subjects reported better Quality of Life Scores in the Psychological and Physical domains.

The lowest mean scores were recorded in the Social Relationship domain. This finding is similar to those by Folasire *et al.* (2012) in Nigeria and Santos *et al.* (2007) in Brazil. Stigmatisation and victimisation of People Living with HIV and AIDS in developing countries of which Ghana is not an exception may explain the lower mean Quality of Life score in the Social relationship domains.

This emphasises the need to improve social inclusion and ensure social support for HIV infected people and to provide a compassionate setting without stigmatisation, discrimination and marginalization. This will ensure that the patients would thrive socially, physically and spiritually. If social support for them is improved, it will help in the improvement of their Quality of Life.

Our finding that the study participants recorded the lowest domain scores in the social relationship domain is to the findings of an Indian study by Wig *et al.* (2006), who reported the highest mean Quality of Life score in the Social Relationship domain. The study posited that because Indians religiously believe in reincarnation, couple with an authoritative call to behave very well towards others in order to ensure reincarnation in the higher realm of life partly explains why Indians have a positive attitude towards others and therefore better score in the Social Relationship domain.

The seemingly better Quality of Life in the physical, environmental and psychological domains may be a reflection of the effectiveness of some of the interventions People Living with HIV and AIDS are exposed to at the STI clinic in the Tamale Teaching Hospital. These interventions are in the form of counselling, on-going psychotherapy sessions and free Highly Active Antiretroviral Therapy.

5.3 Socio-demographic factors affecting Quality of life

5.3.1 Sex and Quality of life

Women reported significantly better facet scores in the energy and fatigue facet under the physical domain, cognitive ability facet under the psychological domain, work capacity facet under the level of independence domain, facet for forgiveness and blame under the

spirituality/religion/beliefs domain and in the overall individual rating of their Quality of Life. This finding could be a general reflection of the better health seeking behavior of females compared to males.

We did not however find any significant gender differences in Quality of Life in all domains. The lack of gender differences in the domain scores in this study may be a reflection of the difference in the demographic profiles as the study had more females than males as participants. This results is similar to findings by (Folasire *et al.*, 2012; Akinboro *et al.*, 2014) when they evaluated the Quality of Life among Living with HIV and AIDS in Nigeria. The finding is also similar to those in studies conducted outside of the sub region by (Perez *et al.*, 2005; Belak Kovačević *et al.*, 2006) in Croatia and Spain respectively, which did not also document significant gender difference in the Quality Of Life in HIV and AIDS subjects.

In direct contrast, however, several other studies have reported significant gender difference in the Quality of Life among People Living with HIV and AIDS Abasiubong *et al.* (2010) and Abboud *et al.* (2010) in Nigeria and Lebanon respectively, reported significantly higher scores in the Quality of Life domains in males compared to females.

Our study found that female participants had better Quality of Life scores in the Spiritual/Religious/Belief domain compared to the male participants. Chandra *et al.* (2010), found similar results in their study in India and postulates that the results is indicative of the fact that females tend to be more spiritually inspired than men.

5.3.2 Marital Status and Quality of Life

Our study reported better mean Quality of Life scores in the Social relationship domain for married subjects compared to those who were single, divorced and those widowed. We also

recorded higher mean scores in the Psychological, Environment, Spiritual/Religious/Beliefs domains and also in the Overall Quality of Life for married subjects compared to the others. This is because married patients are more likely to enjoy better social support, satisfactory social activities and better interpersonal relationship which could impact positively on their Quality of Life. This is consistent with a host of other reports by (Murri *et al.*, 2003; Belak Kovačević *et al.*, 2006; Abboud *et al.*, 2010; Akinboro *et al.*, 2014),

Abboud *et al.* (2010), opine that the family setting usually provides safety, financial support and security which goes a long way to influence well-being and for that matter Quality of life. The unmarried patients however, reported high quality of life scores in the level of independence domain. Other studies in South Africa have shown that marital status was not associated with any domain of Quality of Life according to a study by (Peltzer and Phaswana-Mafuya, 2008).

5.3.3 Age and Quality of Life

The present study found significantly better Quality of Life scores in the Social relationship domain in older participants compared to younger ones. The fact that the elderly easily build personal relationship better which ensures social inclusion and social support accounts for the reason why older subjects will have better mean scores in the Social Relationship domain of Quality of Life.

This result is corroborates a study by Khumsaen *et al.* (2012), who found better mean quality of life scores for older subjects compared to younger ones. It however contradicts a study by Agrawal *et al.* (2014), who did not find any significant difference in the mean Quality of Life scores between young and older subjects in HIV positive residents in Kathmandu valley of Eastern Nepal.

5.3.4 Educational Status and Quality of Life

We documented better scores in the domains of Quality of Life in educated people (secondary and tertiary education) compared to subjects with no formal education or only primary education. A possible explanation of this finding is that people who are educated may be more knowledgeable about the disease, its severity and complications and are therefore able to alter their life styles in order to cope and thrive effectively with the disease and this may impact positively on their quality of life. This result is comparable to what has been reported by Jelsma *et al.* (2005), Belak Kovačević *et al.* (2006) and (Wig *et al.*, 2006), but it contradicts the findings of Akinboro *et al.* (2014) and Abboud *et al.* (2010) which reported better Quality of Life in subjects with no formal education and only primary education.

5.3.5 Employment status and Quality of Life

Our findings showed better Quality of Life tallies in all domains for participants in formal employment compared to those in informal employment and those unemployed. A significant difference in the Quality of Life scores was recorded in the Environment and psychological domains.

The unemployed subjects recorded poorer Quality of Life scores in all domains when compared to those in formal employment and informal employment. This may be a result of the fact that people who are unemployed may lack access to basic necessities including health care and could get sicker with a negative impact on their Quality of Life and not that unemployment itself directly affected their Quality of Life. This is consistent with reports by Imam *et al.* (2011) and

Corless *et al.* (2013) who conducted similar studies among HIV patients and found employment to be significantly associated with quality of life scores.

5.4 Clinical Factors

5.4.1 CD4 Lymphocyte count and Quality of Life

We reported significantly higher mean Quality of life scores in most domains and also in the Overall Quality of Life scores for subjects with stage 1 disease ($CD4 \geq 500\text{cell/mm}^3$) compared to those with stage 2, stage 3 and stage 4 according to the WHO's criteria for staging HIV and AIDS using CD4 lymphocyte count. This is consistent with reports by Jelsma *et al.* (2005) who found CD4 lymphocyte count to be positively linked to Quality of life, especially in the psychological and physical domains. Gowda *et al.* (2012), also reported a significant association between Quality of life and CD4 lymphocyte count. They found higher CD4 lymphocyte count to be positively correlated with higher Quality of life scores compared to those with a lower CD4 count.

The present study also revealed that subjects with stage 4 disease ($CD4 \text{ lymphocyte count} < 200 \text{ cell/mm}^3$) reported significantly lower mean Quality of Life scores in all domains and also in the overall Quality of life. This finding is consistent with earlier reports by (Santos *et al.*, 2007; Marashi *et al.*, 2009; Reis *et al.*, 2010).

Nirmal *et al.* (2008), also reported lower mean Quality Of Life scores among HIV infected people who had lower CD4 lymphocyte, count especially in the physical domain. Patients with stage 4 HIV disease might have started showing symptoms of immunosuppression and are very likely to experience fatigue and discomfort. This feature will, however, be absent in patients with higher CD4 count. The worsening in the physical health of patients with lower CD4 count may

manifest clinically as signs and symptoms associated with immunosuppression and which invariably takes a toll on their psychological health and therefore the overall Quality of Life will be affected.

5.4.2 Anaemia and Quality of Life

We found anaemia to be significantly associated with the Quality of life of HIV and AIDS patients in the Tamale Metropolis, especially in the Physical and Social Relationship domains. A drop in haemoglobin levels directly affects the individual's ability to carry out daily life functions because of the drop in energy levels and the fatigue associated with anaemia. This finding is corroborated by a host of other studies such as those by Fauci and Clifford Lane (1998), and Hasanah *et al.* (2011), who found anaemia to be strongly related to the Physical domain of Quality of Life.

Volberding *et al.* (2004), reported a significant drop in physical function resulting in subjects inability to carry out daily activities among HIV and AIDS patients with haemoglobin levels lower than 12g/dl.



CHAPTER 6

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

In general, the Quality of Life of participants in this study was good. Study participants showed good scores in the physical and environment domains but had poor scores in the Social Relationship and Spiritual/Religious/Beliefs domains. Being in a marital relationship, being in formal employment and being educated was positively associated with good Quality of Life scores of the participant in this study.

Our study did not report significant gender disparities in all the Quality of Life domains, but the multitude of females in our study population shows that the burden of HIV and AIDS is still largely being borne by females.

Improved CD4 lymphocyte cell count and increased haemoglobin concentration could lead to better Quality of Life among HIV and AIDS patients.

6.2 Recommendations

- There is a need for education and sensitization by all stake holders including Ministry of Health, Metropolitan, Municipal and District Assemblies, Non-Governmental Organization and the Ghana Aids Commission on the need to improve social inclusion and ensure social support for People Living with HIV and AIDS so as enable them fully integrate into society without fear.

- The Ministry of Health and the Ghana Health Service must empower health workers and care givers involved in the care and management of People Living with HIV and AIDS to routinely evaluate the Quality of Life these patients.
- Further studies using this study as a baseline is recommended for futures researchers. Also, future studies may include a lot more facilities so as to get a full picture of the Quality of Life situation among HIV and AIDS patients in the country.

6.3 Study Limitations

Our study is limited in number of ways;

First, the original language of the WHOQOL-HIV BREF instrument had to be translated into a local language and this could impact on our findings even though we took steps to minimise that.

Second, the information provided could be influenced by recall bias in view of the fact that the WHOQOL- HIV BREF tool measures Quality of Life within the last two weeks before the interview.

Again the WHOQOL-HIV BREF instrument has not been validated in this setting, hence its validity, reliability and internal consistency could not be ascertained.

Because our study design is cross-sectional, it makes it difficult to attribute causality on the relationship of the socio-demographic factors and clinical factors with Quality of Life.

Lastly, because the study population was made up of patients seen in TTH, a tertiary health care facility, our findings may not apply to the generality of the People Living With HIV and AIDS in Ghana.

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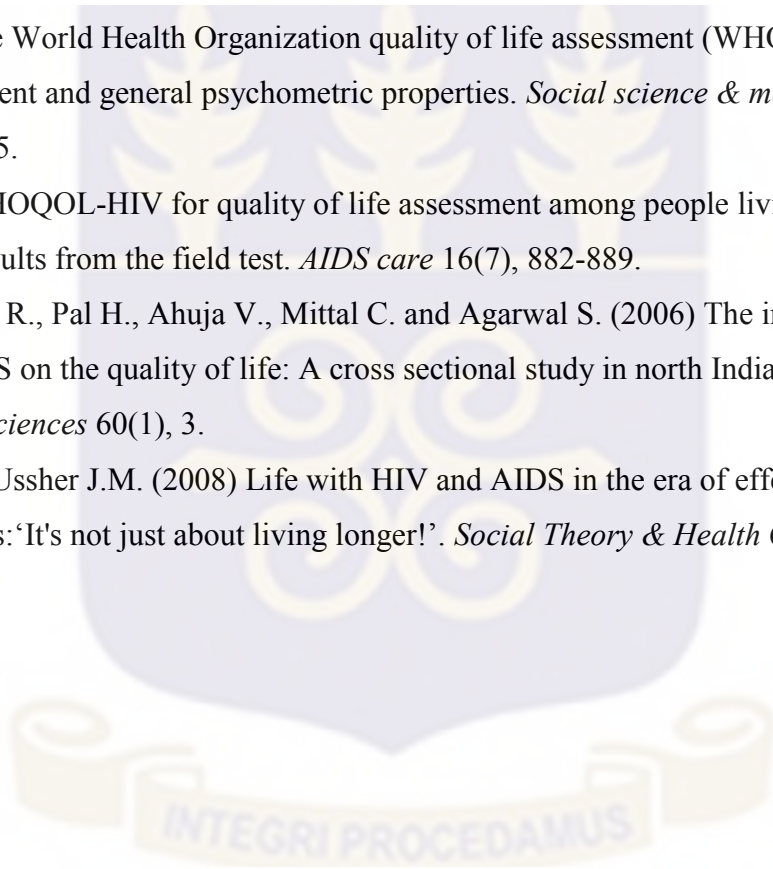
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Appendix 1: Questionnaire

Department of Epidemiology

School of public health

University of Ghana

Topic: **Quality of Life among HIV and AIDS Patients in the Tamale Metropolis**

Dear Sir/Madam

I am a student pursuing a Master of Philosophy degree in Applied Epidemiology and Disease Control from the above university. I am currently undertaking a research on the Topic “**Quality Of Life among HIV and AIDS Patients in the Tamale Metropolis**”. I would like to seek for your cooperation to help complete this questionnaire as honestly as possible. I wish to assure you that the information is for academic purposes only and would be used for research purposes. It would be treated with the highest degree of confidentiality.

ABOUT YOU

Before you begin we would like to ask you to answer a few general questions about yourself: by circling the correct answer or by filling in the space provided.

What is your **gender**? Male / Female

How old are you? _____ (age in years)

What is the highest **education** you received? None at all / Primary / Secondary / Tertiary

What is your **marital status**? Single / Married / Divorced / Widowed

How is your **health**? Very Poor / Poor / Neither Poor nor Good / Good / Very Good

Haemoglobin.....g/dl

CD4 COUNT.....

Please respond to the following questions if they are applicable to you:

What is your HIV serostatus ?	Asymptomatic / Symptomatic / AIDS converted
In what year did you first test positive for HIV?	
In what year do you think you were infected?	
How do you believe you were infected with HIV ? (circle one only):	
Sex with a man / Sex with a woman / Injecting drugs / Blood products / Other (specify)	

Instructions

This assessment asks how you feel about your quality of life, health, or other areas of your life. **Please answer all the questions.** If you are unsure about which response to give to a question, **please choose the one** that appears most appropriate. This can often be your first response. Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last two weeks.**

You should circle the number that best fits how well you are able to concentrate over the last two weeks. So you would circle the number 4 if you were able to concentrate very much. You would circle number 1 if you were not able to concentrate at all in the last two weeks.

Please read each question, assess your feelings, and circle the number on the scale for each question that gives the best answer for you.

		“Very poor	Poor	Neither poor nor good	Good	Very good
1(G1)	How would you rate your quality of life?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2 (G4)	How satisfied are you with your health?	1	2	3	4	5

The following questions ask about **how much** you have experienced certain things in the last two weeks.

		Not at all	A little	A moderate amount	Very much	An extreme amount
3 (F1.4)	To what extent do you feel that physical pain prevents you from doing what you need to do?	1	2	3	4	5
4 (F50.1)	How much are you bothered by any physical problems related to your HIV infection?	1	2	3	4	5
5 (F11.3)	How much do you need any medical treatment to function in your daily life?	1	2	3	4	5

6 (F4.1)	How much do you enjoy life?	1	2	3	4	5
7 (F24.2)	To what extent do you feel your life to be meaningful?	1	2	3	4	5
8 (F52.2)	To what extent are you bothered by people blaming you for your HIV status	1	2	3	4	5
9 (F53.4)	How much do you fear the future?	1	2	3	4	5
10 (F54.1)	How much do you worry about death?	1	2	3	4	5
		Not at all	A little	A moderate amount	Very much	Extremely
11 (F5.3)	How well are you able to concentrate?	1	2	3	4	5
12 (F16.1)	How safe do you feel in your daily life?	1	2	3	4	5
13 (F22.1)	How healthy is your physical environment?	1	2	3	4	5

The following questions ask about **how completely** you experience or were able to do certain things in the last two weeks.

		Not at all	A little	Moderately	Mostly	Completely
14 (F2.1)	Do you have enough energy for everyday life?	1	2	3	4	5
15 (F7.1)	Are you able to accept your bodily appearance?	1	2	3	4	5
16 (F18.1)	Have you enough money to meet your needs?	1	2	3	4	5
17 (F51.1)	To what extent do you feel accepted by the people you know?	1	2	3	4	5
18 (F20.1)	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
19 (F21.1)	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5
		Very poor	Poor	Neither poor nor good	Good	Very good
20 (F9.1)	How well are you able to get around?	1	2	3	4	5

The following questions ask you how **good or satisfied** you have felt about various aspects of your life over the last two weeks.

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
21 (F3.3)	How satisfied are you with your sleep?	1	2	3	4	5
22 (F10.3)	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5

23 (F12.4)	How satisfied are you with your capacity for work?	1	2	3	4	5
24 (F6.3)	How satisfied are you with yourself?	1	2	3	4	5
25 (F13.3)	How satisfied are you with your personal relationships?	1	2	3	4	5
26 (F15.3)	How satisfied are you with your sex life?	1	2	3	4	5
27 (F14.4)	How satisfied are you with the support you get from your friends?	1	2	3	4	5
28 (F17.3)	How satisfied are you with the conditions of your living place?	1	2	3	4	5
29 (F19.3)	How satisfied are you with your access to health services?	1	2	3	4	5
30 (F23.3)	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to **how often** you have felt or experienced certain things in the last two weeks.

		Never	Seldom	Quite often	Very often	Always
31 (F8.1)	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	1	2	3	4	5”

THANK YOU FOR YOUR HELP



Appendix ii: Consent Form

INFORMED CONSENT FORM

CONSENT TO PARTICIPATE IN A HUMAN RESEARCH PROTOCOL

Project title: Quality of Life Among HIV and AIDS Patients, Tamale Metropolis

I..... have been invited to take part in the research Quality of Life Among HIV and AIDS Patients, Tamale Metropolis

I have been told the purpose of the research. **All participants will undergo counselling. Laboratory estimation of HB and CD4+ would be carried out on their samples.**

I have been told as part of the procedure of the study I will provide answers to a couple of questions in an interview session. I will be asked to provide 3mls of blood sample. A trained technician will insert a needle into my vein in one of my arms and draw some blood for testing. This may cause pain, discomfort or bruising at the site of the needle insertion. **Patients whose HB and CD4+ fall outside the reference ranges will be referred for further management.**

The risk or danger and discomfort:

By participating in this research any unlikely harm that may occur to me as a result of this research, I will be given free medical care in this very hospital. **Patients would be counseled on the psychological risk and anxiety associated with knowing that one's HB or CD4+ count is lower than expected.**

Benefits:

There is a personal benefit to be derived in this particular research in the form of knowing one's HB and CD4+ count and ultimately, the findings of this study would improve the health of the community at large as it would help inform policy.

Confidentiality:

The information that is collected from this research is restricted to the principal investigator. A code will be assigned to my name and the code used afterwards, not my name. The findings of this study will be reported at meetings, seminars and in medical journals but my name will not be used in the reports.

My right to refuse or withdraw:

I have the right to take part in this research or not without losing any benefit. I may stop participating in this research any time I wish.

Contact information:

If I have any questions I may ask that now or later, I may contact Razak Gyesi Issahaku at Tamale Teaching Hospital on (0243263602), Dr. Priscilla Nortey of the School of Public Health on (0243303362) and Hannah Frimpong of the Ghana Health Service Ethical Review Committee on (0507041225).

I have read the above information/ **it has been read and well translated to me in my local language in the presence of a witness.** I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction.

I consent voluntarily to participate as a subject in this study and understand that I have the right to withdraw from the study at any time.

Signed by:.....

Name:..... Date:.....

Place.....

If illiterate right thumb print

.....

Name of witness.....

Signature.....

Appendix iii: Information Sheet

Consent Form – Participants

Study Title: Quality of Life Among People Living HIV and AIDS, Tamale Metropolis

Principal Investigator: Razak Gyesi Issahaku

Qualification: MPhil Applied Epidemiology and Disease Control

Address: School of Public Health, University of Ghana, Legon

Greetings, my name is and I am conducting this interview on behalf of Razak Gyesi Issahaku, a Master of Philosophy Applied Epidemiology and Disease Control resident, School of Public Health, University of Ghana.

With key advances in medical treatment, People Living With HIV and AIDS (PLWHA) are living longer and their Quality of Life (QOL) has become an important focus for researchers and health care involve in HIV and AIDS management.

Highly Active Antiretroviral Therapy (HAART) has been associated with improved clinical and laboratory outcomes, leading to fewer opportunistic infections and overall decreases in morbidity and mortality. However, the need for life-long medication therapy, medication side effects, and the constant stigma, discrimination and prejudice experienced by PLWHA have raised concern about other domains of health such as overall physical and mental health functioning, psychological, environmental socioeconomic and spiritual wellbeing. These domains of health which are indicators of QOL have emerged as important factors in HIV/AIDS management.

Again, there has been a broadening in focus in the measurement of health beyond traditional health indicators such as mortality and morbidity, to newer indicators which include measures

of the impact of disease and impairment on daily activities and behavior, perceived health measures and disability / functional status measures. The QOL assessment is focused on interventions resulting from these indicators and may lead to better overall patient well-being.

Finally, very little information is available about the assessment of quality of life among people living with HIV/AIDS in Ghana. This study will therefore serve provide baseline information.

You are being invited to participate in the study because I understand you know the importance of your health, especially during pregnancy and you also were referred here from another facility.

I would like to request you to be part of my study. If you agree to participate in this study, I would ask you a few questions centered on this pregnancy and your referral experience. This will take about 15 minutes of your time.

If you agree to participate, you will be among 406 clients who will also be participating in the study in this hospital.

Participating in this study is entirely voluntary. You have the right to refuse to participate and this will not affect your rights in any way, especially with receiving healthcare. You are also at liberty to withdraw from this study at any stage of your participation. I would however love to see you participate to the end.

There are no direct benefits or risks in participating. You will not be paid or compensated for your participation. However, the info that the study will come out with will help us to understand the factors associated with poor quality of life among HIV and AIDS patients in the Tamale

Metropolis. The questions are not very sensitive. However, whenever you feel uncomfortable answering some of them, you may choose not to answer them.

All the info collected from you will be kept strictly confidential and will be used for the intended purpose only. You will not be identified by name in any dissemination reports or publications resulting from this study.

The Ghana Health Service Ethics Review Committee has reviewed and given approval for this study to be conducted.

Do you have any questions or clarifications?

If any of your questions were not satisfactorily answered by me, or you have further questions regarding this study, you may contact:

Razak Gyesi Issahaku, (Principal Investigator) at Tamale Teaching Hospital, on: Tel. 0243263602 or e-mail: gyesi2g3@gmail.com

Dr. Priscilla Nortey, (Supervisor), School of Public Health on Tel: 0243303362

Hannah Frimpong: Ghana Health Service Ethical Review Committee on Tel 0507041223 or ghserc@gmail.com

Appendix IV: Ethical Clearance

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.



Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Tel: +233-302-681109
Fax + 233-302-685424
Email: ghserc@gmail.com

My Ref. GHS/RDD/ERC/Admin/App/17/542
Your Ref. No.

Gyesi Razak Issahaku
School of Public Health
University of Ghana
Legon

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	GHS-ERC: 55/12/2016
Project Title	"Quality of Life Among HIV and AIDS Patients in the Tamale Metropolis "
Approval Date	14 th March, 2017
Expiry Date	13 th March, 2018
GHS-ERC Decision	Approved

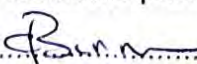
This approval requires the following from the Principal Investigator

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report **after completion** of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
DR. CYNTHIA BANNERMAN
(GHS-ERC CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra

