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DETERMINANTS OF HEALTH RELATED QUALITY OF LIFE IN HIV-POSITIVE PATIENTS ON ANTIRETROVIRAL THERAPY

BY

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DECLARATION

I, Cynthia Emefa Sena, hereby declare that with the exception of cited literature, this dissertation is the result of my own original research supervised by Dr. Reginald Quansah. This dissertation has not been presented elsewhere either in part or in whole for purposes of the award of another degree.

Cynthia Emefa Sena …… ……

Student Signature Date

Dr. Reginald Quansah ……..……. ……...……

(Supervisor) Signature Date

DEDICATION

This dissertation is dedicated to the Almighty God for His guidance and protection throughout the survey.

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ABSTRACT

Background

The introduction of antiretroviral therapy (ART) has made HIV/AIDS a chronic disease rather than a deadly one and hence the need for Health Related Quality of Life Assessment (HRQoL). Due to the increase in the prevalence of HIV/AIDS in the Greater Accra Region, there has been the need to carry out this study to assess health related quality of life and its determinants among infected persons in the region.

Objectives

The main objective of the study was to assess factors that influence HRQoL. Therefore, HRQoL was measured among patients and associations between sociodemographic factors, adherence to medication, psychological factors and HRQoL were evaluated.

Method

Three hundred and seventy- six (376) HIV positive patients receiving care at the Greater Accra Regional Hospital were randomly sampled and interviewed using a four (4) sectioned questionnaire. The questionnaire consisted of socio- demographic data, the World Health Organization Quality of Life- Human Immunodeficiency Virus Bref (WHOQoL- HIV Bref), the Simplified Medication Adherence Questionnaire (SMAQ) and Hospital Anxiety and Depression (HAD) scales. Data collected was entered into Statistical Package for Social Sciences (SPSS) software version 20 and exported into Stata version 15. Analysis was done using means, standard deviation, percentages, frequencies, and associations determined by using ANOVA, Pearson's chi squared test and multivariate regression analysis.

Results

Mean domain scores were highest for spiritual, religious and personal belief domain reporting the highest domain score (14.84±3.62) and social domain reporting the lowest domain score (12.24±3.08). Additionally, 61.70% (232) reported good overall quality of life. Based on multilinear regression analysis between determinants and domain scores and overall quality of life, anxiety and depression were the most dominant factors that had association with all the domains and overall quality of life at a p-value of <0.001. Abnormal levels of anxiety and depression showed much decreased domain scores as compared with normal level of anxiety and depression.

Conclusion

Overall quality of life for majority of HIV positive patients at Ridge Hospital was good. Counseling should also be intensified for infected patients on improving their social relationships. Much attention has to be devoted to assessing anxiety and depression among PLWHA for prompt assessment.

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LIST OF ABBREVIATIONS

HIV	Human Immuno- deficiency Virus
AIDS	Acquired Immuno-deficiency Syndrome
ART	Antiretroviral Therapy
HRQoL	Health Related Quality of Life
UNAIDS	United Nations Joint Programme on HIV/AIDS
PLWHA	People Living with HIV/AIDS
ARVs	Antiretrovirals
NACP	National AIDS Control Programme.
WHO	World Health Organization
NRTI	Nucleotide Reverse Transcriptase Inhibitor
NNRTI	Non Nucleotide Reverse Transcriptase Inhibitor
PI	Protease Inhibitor
AMA	Accra Metropolitan Assembly
GHS	Ghana Health Service
CSSD	Central Supplies and Surgical Department
OPD	Out Patient Department

GEEMA	Grupo Espan˜ ol para el Estudio Multi-factorial de la Adherencia
WHOQoL – HIV Bref	World Health Organization Quality of life– Human Immunodeficiency Virus Bref
SMAQ	Simplified Medication Adherence Questionnaire
HADS	Hospital Anxiety and Depression Scale
SPSS	Statistical Package for Social Sciences
HAT – QoL	HIV/AIDS Targeted – Quality of Life Questionnaire
SPH	School of Public Health
GAC	Ghana AIDS Commission
EQ-5D- 3L	EuroQoL Five –dimensions-Three- level
SRPB Domain	Spiritual, Religious and Personal Belief Domain
QoL	Quality of life
BMI	Body Mass Index
PTSD	Post Traumatic Stress Disorder
MOS-HIV Survey	Medical Outcome Study, HIV Survey
NACS	Nutrition Assessment, Counseling and Support
GBD	Global Burden of Disease

HSS	HIV Sentinel Survey
US	United States
PHS	Physical Health Summary
MHS	Mental Health Summary
NAP+ Ghana	Network of Persons Living with HIV/AIDS in Ghana
UGSOP	University of Ghana School of Pharmacy
MDG	Millennium Development Goal
STI	Sexually Transmitted Infection
VAS	Visual Analogue scale
GARH	Greater Accra Regional Hospital

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

HIV/AIDS has been in existence for three (3) decades now (United Nations Joint Programme on HIV/AIDS (UNAIDS), 2016) and the introduction of the Antiretroviral Therapy (ART) and its successes have made it a chronic disease, rather than a deadly disease as it used to be in the 1980s (UNAIDS), 2015). Successes of ART include reduction in rates of death, spread and viral load suppression (Hassan, Amid and Mohd Salleh, 2013). Globally, in 2017, almost 36.9 million people were living with HIV/AIDS; 1.8 million people became newly infected and 940,000 people died from AIDS-related illnesses (UNAIDS, 2018). Prevalence of HIV/AIDS in Sub Saharan Africa, was more than two- thirds of the global estimate by the end of 2017 (Kates, 2015). AIDS related deaths recorded in 2017, globally, was 940,00 (United Nations Joint Programme on HIV/AIDS (UNAIDS), 2018) and 7.3 million people in 2016 (UNAIDS, 2017). In Ghana, HIV prevalence for 2017 was 1.67 per cent, showing a fall in prevalence as compared with 1.85 per cent in 2013. Number of people infected in Ghana by the end of 2017, was 313,036(Ghana AIDS Commission, 2017).

HIV infection impacts greatly on individuals, societies and the economy of countries. It is of no doubt that HIV/AIDS infection is one of the greatest public health concerns of countries including Ghana. Antiretroviral drugs given for free to infected persons and other diagnostic materials procured with some international aid and also government funds are efforts put in to deal with the infection. In a study by Twumasi (2010), on *The Economic Impact of HIV/AIDS on*

Labour and Capital on the Ghanaian Economy, he found that young people in their productive years have a high risk of HIV infection and this group forms largely the labour force of the country. The epidemic therefore, impacts directly on labour supply and indirectly on the provision of capital.

In 2012, the UNAIDS launched the Treatment 2015 initiative, which aimed at reaching 15 million people with HIV treatment was successfully achieved before the end of 2015 (UNAIDS), 2015). Currently, a number of countries, including Ghana, have adapted the treatment of all people living with HIV/AIDS (PLWHA) irrespective of their CD4 count or viral load, based on the evidence that, early initiation of antiretroviral therapy reduces rates of sexual transmission and clinical events, indicating both individual and public health benefits (Cohen et al., 2011). With the introduction of antiretroviral therapy, mortality rates have reduced by 51 per cent from 2004 to 2017, making HIV/AIDS a chronic and manageable condition. In the management of HIV/AIDS, the primary objective for treatment is to ensure virologic suppression and assess the safety of treatment. Additional evaluation and monitoring is required based on clinical signs and symptoms, co- morbidities, ART adherence or at the discretion of the patient or provider (Division Francisco Hospital, Antiretroviral and Initiation, 2010). However, these are not the only outcomes that should be taken into account. In chronic diseases, assessing health-related quality of life (HRQoL) has become an integral part of follow-up. HRQoL measurements provide valuable feedback about therapeutic interventions and they are indispensable in cost-effective analyses (Kaplan and Ries, 2007).

The World Health Organization (WHO), defines health as a state of complete physical, mental and social well- being and not merely the absence of disease ("WHO | Constitution of WHO: principles," 2016). The measurement of health and its effect should not only include an

indication of changes in the frequency and severity of disease but also an estimation of wellbeing which is assessed by measuring the improvement in the quality of life (QoL) related to healthcare. Quality of life (QoL) and health related quality of life (HRQoL) are used interchangeably in relation to healthcare. WHO defines quality of life as "individuals' perception 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". It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment (Department of Mental Health and Substance Dependence, 2002). Assessment of HRQoL and the factors that influence it among PLWHA has become of much importance because it is vital to understand the impact of disease, drug treatment and other medical regimen on the lives of patients and also understand whether drug regimen translate into benefits that patients can experience. Although traditional outcomes, such as mortality, physiologic changes, and adverse events provide useful clinical and biological information, they may not accurately represent the effect of treatment on the patient's physical, psychological, and social functioning and their subjective sense of well- being (Wu, 1999). Also, health worker – patient relationship is improved because a more complete form of assessment covering different aspects of patients' functioning is being carried out and patients themselves may find their health care more meaningful. When policies are also implemented, it is important to determine the impact of the policy on the quality of life of PLWHA and therefore a way of evaluating implemented policies.

1.2 Problem Statement

The guideline for antiretroviral therapy in Ghana does not contain HRQoL assessment (NACP, 2010), which has become a component in the management of HIV/AIDS. HIV/AIDS over the years has become a chronic condition with the successes of ART ((United Nations Joint Programme on HIV/AIDS (UNAIDS), 2015) and hence it has become very important to measure HRQoL to provide valuable feedback about therapeutic interventions made and also to identify determinants influencing it in order to maximize HRQoL among PLWHA. In spite of the fact that mortality rates have decreased among HIV positive patients and HIV/AIDS is now a chronic condition, PLWHA continue to face several challenges (Cloete et al., 2010). In Southern Ghana, challenges faced by HIV positive patients on ART, include high financial cost associated with accessing and receiving ART, shortage of drugs and other commodities and fear of side effects of antiretroviral therapy, thereby compromising on adherence to medication and job insecurity (Ankomah et al., 2016). A study to assess stress, post-traumatic stress disorder (PTSD), immune function and adherence to ART among patients receiving care at Pantang and Amasaman Hospitals in Ghana, recorded that, 62.5% of the participants had high stress levels, 74% of participants were experiencing PTSD and therefore the need for support and therapy. Stress and PTSD were significantly associated with adherence to medication as adherence to medication is a requirement to achieve optimal viral load suppression thereby preventing disease progression. These challenges make it difficult to achieve optimum biomedical outcomes. Therefore, there is the need to evaluate the impact of HIV/AIDS, on the life of PLWHA and its determinants to improve treatment outcomes.

1.3 Conceptual Framework

The conceptual framework illustrated below is a diagram representing the six domains of the WHOQoL- HIV Bref and factors of interest in this study. The six domains of the WHOQoL – HIV Bref are physical, psychological, level of independence, social relations, environmental and spiritual, religion and personal belief (SRPB). Determinants focused on in this study are socio-demographic (age, sex, marital status, highest education status, employment status and income), level of adherence and psychological factors (anxiety and depression).

Each of the factors under study directly or indirectly influences HRQoL. According to Degroote et al., (2014), older age is associated with decline in physical health over time and hence HRQoL declines. Women have been found to express low quality of life score in all six domains of the WHOQoL-HIV Bref with income and psychosocial support being some of the factors accounting for this disparity (Tesfay, Gebremariam, Gerbaba and Abrha, 2015). Married persons have been found to enjoy more companionship as compared with single widowed persons and hence married persons tend to experience better quality of life. Also, socioeconomic status has an impact on HRQoL. Employment which forms a greater part of our daily life influence physical and mental health. A higher education is indicative of a better employment status and income. This therefore encourages good health seeking behaviours that influence HRQoL. Adhering to medication is key in the management of HIV/AIDS as this has accounted for making HIV/AIDS a chronic disease rather than a deadly one; hence quality of life is improved. HIV/AIDS in itself is a stressor as it deteriorates health and predisposes an infected person to anxiety or depression contributing to poor quality of life.

Focusing on how sociodemographic factors influence HRQoL, older age is accompanied by fear of the future, whiles psychosocial factors favours men than women with married persons enjoying better companionship and are free from much psychological distress as compared to single, widowed and divorced persons. Also, educational status influences an individual's type of occupation as well as income, thereby influencing psychological status which further affects quality of life. Anxiety or depression as a result of the disease in the face of advancing age, being female, being divorced, widowed or single, unemployed and low income further worsens HRQoL. This could further lead to poor adherence to medication. Poor adherence in that instance, worsens health conditions coupled with depressive status, in the face of advancing age, being female, being divorced, widowed or divorced, unemployed and with low income. Adherence to medication improves the health status of an infected person and hence reliefs the infected person of either anxiety or depression thereby improving HRQoL. On the other hand, non- adherence to medication further deteriorates health, predisposing the infected person to anxiety or depression, thereby worsening HRQoL.

This study therefore seeks to determine how these factors within the conceptual framework influences the HRQoL of PLWHA at the Greater Accra Regional Hospital (GARH).

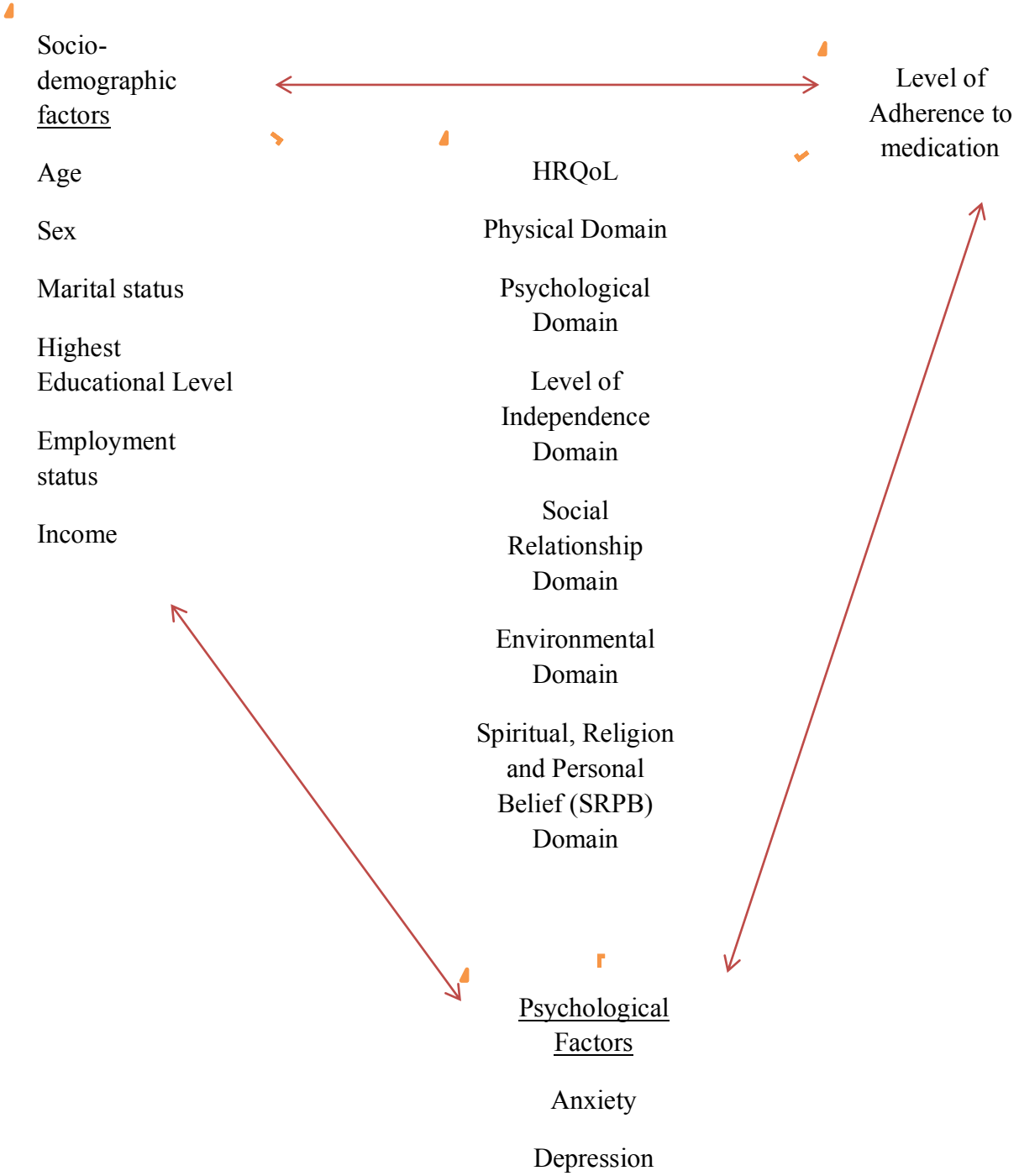

Figure.1 Conceptual Framework of the Determinants of HRQoL of PLWHA on ART

1.4 Justification

Greater Accra Region recorded highest prevalence in the 2017 HIV Sentinel Survey (HSS) and Estimates Report whiles previous years have had Eastern Region reporting the highest prevalence. HIV/AIDS greatly impacts the life of an infected person and is associated with challenges that influence biomedical outcomes. Much research has been done on HRQoL among PLWHA across the globe with minimal researches done in Ghana and especially Accra. Records so far on HRQoL in Accra, focused on the evaluation of the impact of receiving care from nutrition assessment counseling and support (NACS) programme designated clinics in Accra. The impact was evaluated by determining the association between depression and HRQoL among PLWHA in NACS accredited clinics and those that have not been accredited in a prospective cohort study.

This study therefore sought to evaluate HRQoL among PLWHA, identify other factors that influence HRQoL and add onto existing data. Also, this study would further encourage ART clinics to employ a multidisciplinary approach in managing HIV positive patients, help in policy making and also serve as an evaluation for implemented policies. Also, the study would help employ better patient centered approaches to improve on the HRQoL of PLWHA.

1.5 Research Questions

1. What is the HRQoL status of PLWHA?
2. Which socio- demographic factors are associated with HRQoL of PLWHA?
3. Does the level of adherence to antiretroviral medication influence the HRQoL of PLWHA?
4. What is the association between psychological factors (anxiety and depression) and HRQoL of PLWHA?

1.6 Objectives

1.6.1 General Objective

To assess the factors that determine health related quality of life (HRQoL) among people living with HIV/AIDS (PLWHA).

1.6.2 Specific Objective

1. To measure the health related quality of life (HRQoL) among PLWHA

2. To identify socio-demographic determinants associated with HRQoL

3. To determine the association between level of adherence to antiretroviral drugs and HRQoL.

4. To evaluate the association between psychological factors (anxiety and depression) and HRQoL of PLWHA

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Focus of Literature Review

The literature review for this study made use of forty-one (41) articles identified in databases (PUBMED, HINARI, Science direct and Google Scholar), using search terms such as antiretroviral therapy, HIV/AIDS and HRQoL, HRQoL measuring tools, sociodemographic factors and HRQoL in HIV and anxiety and HRQoL in HIV. The review therefore covered successes and challenges of ART, HRQoL of HIV among PLWHA, HRQoL, comparison of HRQoL measuring tools, findings on associations between sociodemographic variables (age, sex, marital status, educational status, employment status and income), adherence to ART, psychological factors (anxiety and depression) and HRQoL respectively.

2.2 Successes and Challenges of ART

Antiretroviral Therapy (ART) are medications (antiretroviral drugs or antiretrovirals), used to treat HIV/AIDS (AIDSinfoNet, 2014). They are given in combinations of three or more drugs depending on the severity or the presence of opportunistic infections. Antiretrovirals aim at reducing the morbidity and mortality associated with the disease, restoring immune function, ensure maximal suppression of viral replication and improve quality of life (Nawaz, Narain, and Pontali, 2002).

A journal on the global burden of disease (GBD) between 1980 and 2015 by Wang et al., (2016), reports a peak in global HIV infection in 1997 with 3.3 million new infection and annual incidence remaining relatively constant at an average of 2.6 million new infections per year since 2005. Mortality in HIV/AIDS has seen steady declines from 1.8 million deaths in 2005 to 1.2 million deaths in 2015. These declines in morbidity and mortality have been associated with the scale up of ART and the prevention of mother to child transmission over the past two (2) decades.

One greatest success of ART is the conversion of HIV/AIDS from a deadly disease to a chronic one requiring long term management (Palmisano and Vella (2011). This is attributed to the introduction of antiretroviral drugs, its availability, accessibility and strict adherence to treatment regimen in spite of the numerous side effects the medications come with. Since the condition is not yet curable, a long term adherence to medication is required and therefore one faces the challenge of long term drug toxicity effects. A trial consisting of participants from Malawi, Zimbabwe, South Africa, Bostwana, Kenya, Thailand, India, and United States (US), enrolled over a period of five (5) years reported that adherence to medication reduces the levels of the virus but causes the effect of inflammation and other complications associated with ageing. Strict adherence to ART has also been seen to reduce the sexual transmission of HIV (Cohen et al., 2016). HIV positive pregnant women on ART with strict adherence to medication also prevent mother to child transmission of the virus and this has led to loss to follow ups of these children. The success of ART has led to the decision of WHO to initiate therapy once an individual is diagnosed and counselled irrespective of the CD4 count or viral load (WHO, 2016). Other challenges reported by Misgena, (2011) include failed treatment response, drug interactions, cardiovascular risk, toxicity and lack of restoration of a solid immunity against HIV.

According to (Wang et al., 2016) the slow decline in incidence is attributed to reduced aid and resources for health devoted to HIV, especially in low- income countries. Achieving the third millennium development goal (MDG) and the 90-90-90 UNAIDS target have been foreseen, challenging, as efforts will be needed from government and international agencies to end AIDS by 2030. Misgena, (2011) also suggests that, national ART programs should design strategies to focus more on monitoring systems (clinical, immunological, virilogical, lost to follow up and adherence) to achieve the goals of ART.

In view of the successes and challenges of ART it has become very important to access the health related quality of life of HIV positive patients thus; focusing on the impact of the disease and treatment regimen on the life of the HIV infected population, serving as an indicator of disease and treatment outcomes (Mafirakureva, Dzingirai, Postma, van Hulst and Khoza, 2016).

2.3 Health Related Quality of Life (HRQoL) among PLWHA

The World Health Organization (WHO) defines health as a state of complete physical, mental, and social well-being and not merely the absence of disease (World Health Organisation, 2006). HRQoL, is equally a broad concept which encompasses the physical and psychological health, environmental and social impact, level of independence and the impact of religion, beliefs and spirituality on the life of an individual suffering from a particular condition (Studies, 2006) and in this context, HIV. The assessment of HRQoL in HIV has become very important because there have been successes associated with the use of ART and therefore it serves as another health indicator aside the use of clinical indicators. The effects of some drugs cannot be assessed through physiologic measurements but can only be discovered from subjective assessment. It also helps clinicians to inform patients on the effects of drug regimen and how to manage these

side effects (Wu, 1999). The assessment of HRQoL goes a long way to improve the cordial relationship between clinicians and patients which also impacts treatment and care (Studies, 2006). According to Wu (1999), it is very important to understand the impact of a disease on the life of an individual, likewise the risk and benefits of treatment regimen and medical procedures. According to Oguntibeju, (2012), administering ART has a direct impact on HRQoL and several reports have confirmed such strong and positive associations. The introduction of ART has increased the life expectancy of HIV positive patients and is gradually becoming the same as that of uninfected persons. A study was therefore conducted by Burns et al., (2017) among Zambian and South African populations by comparing the HRQoL of HIV positive patients against that of uninfected patients, using a standardized generic measure of health across five domains. In their findings, HRQoL scores among PLWHA were not different from that of uninfected persons. George, Bergin, Clarke, Courtney and Codd, (2016) in assessing HRQoL among PLWHA due to the deteriorative nature of the disease in an Irish population established that HRQoL was average among participants and that providing psychosocial support will improve HRQoL among PLWHA. The Medical Outcomes Study HIV Health Survey was used to assess HRQoL and dichotomized as Physical Health Summary (PHS) and Mental Health Summary (MHS) and further grouped as good or poor PHS and MHS based on a standardized mean score of 50. Average PHS; 56(47-60) and MHS; 51 (41-58) scores were recorded and hence the average HRQoL reported.

Much study has not been conducted in Ghana with respect to HRQoL. Abrefa- Gyan, Cornelius and Okundaye, (2015) performed a study on *Socio- demographic Factors, Social Support, Quality of Life and HIV/AIDS in Ghana*, carried out among support group members in Ghana from the Network of Persons Living with HIV/AIDS in Ghana (NAP+ Ghana) to ascertain

whether socio- demographic factors and social support influences quality of life as increased access to ART has not been adequately matched up to psychosocial treatment. Using the Medical Outcomes Studies (MOS) HIV Health Survey, the MOS Social Support Survey (MOS SSS) and a demographic instrument, a positive association was found between social support and overall quality of life whiles, being younger, male, attending meetings and having more than thirteen (13) years of education was associated with higher QoL. Further studies by Abrefa-Gyan et al., (2015) was done on *Gender and Children as the Moderators of the Association between Social Support and QoL among PLWHA in Ghana*. This study also revealed that being male and having children moderated the relationship between social support and QoL. In optimizing care for adolescents who acquired HIV perinatally, Enimil et al., (2016) performed a study focusing on QoL, physical health, psychological wellbeing and social relationships as many have faced challenges with medication use, parent ill health or demise and other physical and psychological concerns. Study was performed among adolescents receiving care in a clinic in Kumasi. Findings included lower than expected QoL with barriers to treatment adherence, limited social support, stigma and significant number of participants not virally suppressed. According to Fosu, (2016) little or no information exists on HRQoL in Ghana and West Africa and therefore sought out to determine HRQoL in Ghana using the Eastern Regional Hospital as the site for data collection. Using the WHOQoL- HIV questionnaire with four domains, a poor overall quality of life was reported with educational level being the only sociodemographic factor positively influencing quality of life in all domains. Ntoni et al., (2017) in assessing HRQoL and associated factors among PLWHA in Ho municipality in Ghana reported 126 (79.75%) and 14 (8.86%) of participants experiencing excellent and good quality of life respectively whiles 18 (11.39) of participants experiencing poor quality of life. Factors that influenced HRQoL were being male,

symptomatic patient, not sexually active and being ART naïve was associated with poor HRQoL. Another study carried out by Issahaku, (2017) in Tamale using the WHOQoL-HIV Bref with six domains, also revealed that a good overall quality of life was reported among HIV positive patients. Good scores were reported in the physical, psychological and environmental domains but poor scores reported in the social relationship and spiritual domains. The study further pointed marital relationship, education, formal employment and CD4 count as positively impacting quality of life scores

Highest prevalence (3.2%) of HIV/AIDS in Ghana is recorded in the Greater Accra and Ashanti regions according to the 2017 HIV Sentinel Survey (HSS) and Estimates Report released by the National AIDS and STI Control Programme. With some works on quality of life performed in the Ashanti region, this study therefore sought to focus on the Greater Accra Region as there has been scanty reports on the region regards HRQoL. Also, the study further sought to identify some determinants of HRQoL. Determinants focused on were socio- demography (age, sex, marital status employment status, marital status, highest level of education and income), level of medication adherence and psychological factors (anxiety and depression) as little information exists on factors such as level of adherence and psychological factors as determinants on HRQoL

The study seeks to assess HRQoL among PLWHA and its associated factors focusing on sociodemographic factors (age, sex, highest educational status, marital status, average monthly income, and employment status), level of adherence and psychological factors (anxiety and depression) in an adult population at Ridge Hospital which is the regional hospital of the Greater Accra region.

2.4. HRQoL Measuring Instruments

There has been widespread interest in the study of patient centered outcomes for two decades now. This has led to the development of rigorous instruments for its measurement. HRQoL outcomes are often complex qualitative variables, which cannot be easily simplified. Each instrument consists of questions grouped into domains and scored on Likert scales (Litwin, 2007). Some HRQoL measuring tools that have been developed include RAND Medical Outcomes Study 36-Item Health Survey, also known as the SF-36, EuroQoL Five Dimension – Three level (EQ-5D-3L), HIV/AIDS-Targeted Quality of Life (HAT-QoL) Instrument, Medical Outcome Study HIV Health Survey (MOS-HIV) , and the World Health Organization Quality of Life – HIV BREF (WHOQoL- HIV Bref), an internationally accepted instrument developed for measuring quality of life. The choice of a tool to measure a characteristic is dependent on its internal consistency and reliability and validity. Reliability measures how dependable or consistently a tool measures a particular characteristic repeatedly, whiles providing the same results. This measure is denoted by Cronbach's alpha (α) value of greater than 0.7. Validity focuses on how well the tool measures the characteristic under study.

According to Coll, Gen, Hunt, Mcewen and Mckenna, (1985), the SF – 36 is a shortened version of a set of 149 questions aimed at assessing how components of American healthcare system affect treatment outcomes. The tool was tested in a population of 22,000 patients. The questionnaire consists of eight (8) scales to measure three (3) aspects of health status covering health functional status, wellbeing and overall evaluation of health. Functional status is assessed by physical and social functioning and role limitation to physical and emotional problems. Wellbeing is assessed by mental health, energy, fatigue and pain. Overall evaluation focuses on general health perception. Responses under each of the eight scales are summed up to provide

scores on a scale of 0-100. Internal consistency for each scale is above 0.8 with factor analysis showing the importance of each of the scales. Clinical validity reported significant differences between different health status and general population. A study by Mafirakureva et al., (2016) to evaluate the HRQoL among PLWHA on ART, receiving care at Chitungwiza Central Hospital in Zimbabwe, whiles evaluating two (2) already validated instruments (EQ-5D-3L and HAT-QoL). EQ-5D-3L has five (5) dimensions covering sections of QoL. These five (5) dimensions cover mobility, self-care, usual activities, pain or discomfort and anxiety and depression. Within each dimension are three (3) levels, namely, no problems, some problems and unable to or extreme problems. Attached is a visual analogue scale (VAS) ranging from 0 (worst health state) to 100 (best imaginable state). The HAT-QoL questionnaire is an HIV specific tool consisting of 34 items within nine domains: overall function, life satisfaction, health worries, financial worries, medication concerns, HIV mastery, disclosure worries, provider trust and sexual function as employed by Oparah, Soni, Arinze and Chiazor, (2013). HAT-QoL expressed good internal reliability consistency greater than 0.7 with EQ-5D- 3L showing <0.7. HAT-QoL expressed good convergent validity with EQ-5D-3L. The MOS-HIV questionnaire consists of 35 items with ten dimensions of health with respect to HIV. The ten dimensions of the questionnaire are health perceptions, pain, physical, role, social and cognitive function, mental health, energy, health distress. Summary of scores is generated under physical and mental health, with higher scores denoting better quality of life. According to (Wu, 1999), various studies have supported internal consistency of the MOS-HIV scale, with Cronbach's α coefficient ranging from 0.90 to 0.92 for physical health summary score and that of mental health scores from 0.91-0.94 across different samples. Evidence of construct validity has proven that the scale measures distinct aspects of health, considering different stages of the illness. The WHOQoL-HIV Bref is an

internationally developed tool for assessing QoL among PLWHA and is a modified version of the WHOQoL- Bref by the addition of specific questions related to HIV. The WHOQoL- HIV Bref consist of 31 facets with six domains namely physical, psychological, level of independence, social relationship, environmental and spiritual, religion and personal belief domains (Studies, 2006). According to Studies, (2006) the modification increased internal consistency and reliability, for instance, that of physical and social domains increased from 0.65 to 0.72 and 0.69 to 0.72 respectively. The spiritual, domain was the only domain with an alpha value of 0.69, which is less than the acceptable value of 0.7. The physical, psychological and level of independence domains had alpha value of 0.74, 0.77, and 0.82 respectively, which are acceptable. In scoring the WHOQoL- HIV Bref, negatively framed responses are reversed and the mean such that higher score indicate a high qol. Mean response determined by summing up scores for each item under each domain and multiplied by 4. The domains are therefore assessed on a range of 4-20 with 4 representing worst domain score and 20, best domain score. General quality (overall quality of life) assessed an infected person's perception of his or her quality of life and satisfaction with health status. Overall quality of life ranges on a scale of 1 to 5 with 1 representing poor overall Qol and 5, very good overall Qol. This was further categorized into two groups; 1 and 2 representing poor Qol and 3 to5 representing good Qol as categorized by Karkashadze, Gates, Chkhartishvili, DeHovitz and Tsertsvadze, (2017) in a Brazillian population.

Considering the above mentioned tools, MOS-HIV scale was the tool with the highest internal consistency and reliability whiles the WHOQoL- HIV Bref is an internationally developed tool involving different cultures and covering all salient aspects of health. For the purposes of this study, the WHOQoL- HIV Bref will be used because of its wide acceptability and also for the

fact that it considers the spiritual aspect of health, which is absent in the other tools (Studies, 2006).

2.5. Factors that Determine HRQoL

HRQoL is affected by many factors that occur simultaneously. Below are some of these factors and their influence on various populations.

2.5.1 Socio – demography

Many socio- demographic factors influence quality of life. According to Briongos Figuero, Bachiller Luque, Palacios Martín, González Sagrado, and Eiros Bouza, (2011), these factors include age sex, educational level, income, marital status and employment status.

Age

A study by Karkashadze et al., (2017) in a Georgian population found age to be associated with HRQoL whiles Odili, Ikhurionan, Usifoh, and Oparah, (2011a) in a Nigerian population, found age to have significant associations with physical, level of independence and social relationship domains of the WHOQoL-HIV Bref. Both studies used the WHOQoL-HIV Bref with six domains in assessing HRQoL. The associations were such that, for the study by Karkashadze et al., (2017), PLWHA who are younger than forty (40) years are more likely to experience poorer quality of life. Similar findings are reported in a study by Mahalakshmy, Hamide and Premarajan, (2011) in an Indian population, where younger age is associated with high risk of poor quality of life. These findings contradict the normal as ageing is associated with decrease in physical health and fear of the future and therefore a lower quality of life expected (Degroote, Vogelaers, and Vandijck, 2014). According to (Odili et al., (2011a), out of four age groups

considered, thus 20-29, 30-39, 40-49 and 50 years and above, 30-39 years age group reported highest mean quality of life scores in the three domains implying better coping strategies to the disease than other age groups.

Sex

According to Costa, Oliveira, Gomes, and Formozo, (2014) higher quality of life scores are reported in all domains of the WHOQoL-HIV Bref for men than with women among PLWHA in North – Fluminese, a municipality in Brazil. This association is attributed to the fact that socioeconomic and cultural factors do not favour women (Picinin, Duarte, Pedroso, Pilatti, and Gutierrez, 2018). Chandra, Satyanarayana, Satishchandra, Satish, and Kumar, (2014), in a study to assess whether men and women differ in their QoL from South India in a cohort study reported that men had better quality of life in the environmental whiles women reported higher scores in the spiritual, religion and personal belief domain (SRPB) and concluded that identifying gender differences will help provide information to improve upon quality of life. Using the WHOQoL- HIV bref, it was established that females reported a lower QoL as compared to males (Tesfay, Gebremariam, Gerbaba and Abrha, 2015). This was attributed to gender differences in the expression of somatic complaints and psychological illness and that women receive less social support and empathy as compared to their male counterparts.

Highest Education Level, Employment Status and Income.

According to Kumar, Girish, Nawaz, Balu, and Kumar, (2014) with higher education, standard of living improves. Education largely informs ones occupation and income and therefore increasing the socio- economic status of the country would increase the HRQoL of PLWHA. Another study by Mwesigire, Wu, Martin, Katamba and Seeley (2015) also supported the findings that education is crucial in improving quality of life as it may improve income and QoL.

According to Odili, Ikhurionan, Usifoh and Oparah, (2011b), a high socio- economic status helps patients in engaging in more preventive and curative health. Issahaku, (2017) in his study reported that employed PLWHA reported higher quality of life scores in all six domains of the WHOQoL-HIV Bref with significant differences reported in the psychological and environmental domains compared to those with informal employment and the unemployed. This association was attributed to the higher probability of the unemployed lacking basic necessities such as access to healthcare, thereby compromising health and negatively impacting HRQoL. Also, better scores were recorded in all domains for educated people (secondary and tertiary education) compared to participants with no formal or only primary education. Less or lack of knowledge in this regard negatively impacts HRQoL.

Marital status

Bello and Bello, (2013) in studying the HRQoL among PLWHA in a secondary healthcare facility in Ilorin, Nigera where high prevalence of HIV has been recorded with the re-emergence of pulmonary tuberculosis (TB), employed the WHOQoL- short form to assess HRQoL. Marital status had a significant effect on QoL such that, married women showed better QoL as compared with unmarried women and this was attributed to the physical, emotional and social support they receive from their partners. Marital status only showed significance in the psychological domain of the WHOQoL-HIV Bref as reported in a study by Issahaku, (2017). Also, married participants showed higher scores in the psychological, social relationship, environmental and SRPB domains.

From the above mentioned studies, some sociodemographic factors that were found to have associations with overall quality of life and domains or facets of HRQoL in Ghana are higher education and marital status. This study therefore seeks to identify sociodemographic factors that

influence or determine HRQoL among PLWHA receiving care at Ridge Hospital. Also, Issahaku, (2017) categorized employment status based on whether participants were formally employed, informally employed or unemployed. This study would rather want to categorize employment status based on whether participants are employed, unemployed or pensioners as there are persons who have gone on retirement and enjoying their social security benefits.

2.5.2. Adherence to Antiretroviral Therapy (ART)

HIV positive patients have the desire to take their antiretroviral drugs because they want to prolong their lives and take care of their children, prevent transmission to their unborn children, suppress the virus and maintain good health (Ankomah et al., 2016.). According to the treatment guideline for ART in Ghana, (NACP, 2010), a triple therapy regimen is recommended for HIV positive individuals and it consists of a first and second line treatment. First line treatment requires the use of two nucleotide reverse transcriptase inhibitor (NRTI) and a non - nucleotide reverse transcriptase inhibitor (NNRTI). The second line treatment consists of two NRTI and a boosted protease inhibitor (PI). The second line is used when an individual becomes resistant to first line treatment. Ninety five percent (95%) adherence to medication is required for effective therapeutic effects of ARVs. In order for patients to disclose their challenges in adhering to medication, experts suggest inquiring about missed doses of medication within a specified period of time (Guidelines for the Use of Antiretroviral Agents in Adults and Adolescents Living with HIV, 2017). A study by Boakye Dorothy Serwaa (2015) revealed that, the side effects of ARV is the major reason for missed doses of ARVs among HIV infected persons. Side effects of ARVs include insomnia, loss of appetite, lipodystrophy, diarrhea, fatigue, mood changes (anxiety and depression), increase in lipid levels, rash, nausea, vomiting, high blood sugar and liver, kidney of pancreas damage (Watson, 2016)

Ten out of twelve studies reviewed showed a relationship between adherence to ART and HRQoL, implying that more adherent PLWHA probably have a better virilogical or immunological status and therefore have a better QoL (Degroote et al., 2014). Similar reports are found in studies by Vikram et al., (2018), to establish a clear association between adherence and HRQoL as previous studies reported an unclear association. A self-report adherence rating scale and WHOQoL-HIV bref were administered to participants in a longitudinal cross sectional study. Patients were observed for the periods of 9-28 months, 49-64 months and 81to 120 months. A strong association was therefore established between adherence to ART and HRQoL such that, adherent patients reported a high HRQoL as compared non- adherent patients. The study concluded that adherence to ART still remains a challenge and therefore efforts need to be invested to make patients adherent. Based on studies by Briongos Figuero et al., (2011) no association was established between adherence to ART and HRQoL. The study by Enimil et al., (2016), in Kumasi (Ghana) among adolescents with HIV/AIDS also mentions the need for strategies to improve on medication adherence as one of the ultimate goals to improve disease management and QoL among PLWHA.

This study therefore seeks to identify the relationship between level of adherence to medication and HRQoL among in an adult population of PLWHA at Ridge Regional Hospital as some studies have been done on adherence in an adolescent population.

2.5.3. Psychological Factors (Anxiety and Depression)

PLWHA experience psychological distress more often than the general population. This adversely affects treatment outcomes. Psychological care therefore has been viewed as evidence to support treatment outcomes in the management of the condition (British Psychological Society, British HIV Association and Medical Foundation for AIDS and Sexual Health, 2011).

Zoungrana et al., (2017a), in a study to describe the epidemiologic and clinical aspects of depressive disorders in Mali, concluded that depression is associated with anxiety, increased body mass index (BMI) and CD4 count less than 200 cells/mm^3 and therefore plays an important role in disease progression**.** Depression is associated with HRQoL such that patients free from depression or minimal depression have higher HRQoL scores (Broingos Figuero et al., 2011). HIV positive patients experience anxiety from the condition and also from medications taken. Women experience high rates of depression as a result of HIV stigma, reproductive health related worries or experiencing judgement from family and friends about getting pregnant(American Psychiatric Association, 2012). Anxiety is associated with HRQoL; as anxiety rates decrease, HRQoL improves (Degroote et al., 2014). After the nutrition assessment counseling and support (NACS) programme was instituted in Ghana among PLWHA by the Food and Nutrition Technical Assistance (FANTA) in October, 2009, the impact was assessed by Sackey, Zhang, Rogers, Aryeetey, and Wanke, (2017), where depression and HRQoL were evaluated. Depression was assessed using the Centre for Epidemiologic Studies Depression Scale, whiles HRQoL was assessed using the EuroQoL five dimensions questionnaire in a prospective cohort comparing PLWHA receiving care in designated NACS HIV clinics and Non HIV to those in non- designated NACS HIV clinics. No significant association was established between receiving care in NACS HIV clinic and HRQoL. Even though less depressive symptoms were observed among participants in NACS designated HIV clinics, it did not translate into higher HRQoL scores and hence the instituted programme not successful. Much has therefore not been done with regards the association between psychological factors (anxiety and depression), therefore this study seeks to uncover this association.

2.6. Conclusion

Much study has not been done with regards the Health related quality of life (HRQoL) assessment for HIV positive patients in Ghana especially in Accra. Studies done in Ghana on HRQoL have not focused much on level of adherence, anxiety and depression in relation to HRQoL. This study therefore sougth to evaluate HRQoL and its associated factors among PLWHA receiving care at Ridge Regional Hospital using the WHOQoL-HIV Bref with six domains, an internationally accepted tool designed for assessing HRQoL in various populations.

CHAPTER THREE

3.0 METHODOLGY

3.1. Study Design

A hospital based cross sectional study design, involving quantitative approach was used in carrying out the study. Face to face interview with a structured questionnaire was used in data collection.

3.2 Study Location

The hospital-based survey was carried out at the Greater Accra Regional Hospital (GARH) at Adabaraka. The region is located in the south- east of the Gulf of Guinea with coastal savannah and a little forest area towards the Eastern Region. The GARH is located within the Osu Klottey sub metro of the Accra Metropolitan Assembly (AMA) with the GPS code 5.5611, -0.1985 and believed to have been opened in the British colonial days in 1928. The hospital which has a 470-bed capacity, is a public health institution that provides optimum health care services to people living in Accra and beyond thus; takes on referral cases from other health facilities. Also, the hospital is divided into various departments for the effective execution of its duties. These departments are Pharmacy, Medical Stores, Out – Patient Department (OPD), Child Health, X – ray, Laboratory, Ear, Nose and Throat, Antiretroviral Therapy (ART) Clinic, Family Planning, Obstetrics and Gynaecology, Central Supplies and Surgical Department (CSSD), Medical Emergency, Psychology, Physiotherapy, Disease Control, Public Health, National Poison's

Centre and Administration. These departments work hand in hand to ensure that the health needs of patients are achieved.

The GARH was chosen because it is the central healthcare facility for the city of Accra and hence results of the study performed there is representative of the entire region.

For the purposes of this study, emphasis was laid on the ART Clinic, which is also a referral centre. The total number of HIV positive patients who actively attended the clinic at the year 2017 was 4171 patients. The clinic opens from Mondays to Fridays during which voluntary counseling and testing for HIV are organized at no cost.

3.3 Source Population/ Study Population

The source population was all People Living with HIV/AIDS (PLWHA) receiving care at the GARH. From this population, 385 patients were randomly sampled (see section 3.7.2 for selection method)

3.4 Inclusion Criteria

Patients who were confirmed as HIV positive and receiving care at the GARH's antiretroviral therapy (ART) Clinic, eighteen (18) years and above and who readily gave their consent took part in the survey.

3.5 Exclusion Criteria

PLWHA, who were critically ill, and those who had not started taking antiretrovirals (ARVs) were excluded from the survey.

3.6 Study Variables

3.6.1 Dependent Variable

The dependent variable was health related quality of life (HRQoL), measured by six domains and overall quality of life. The six domains were physical, psychological, level of independence, social relationship, environmental and spiritual, religion and personal beliefs.

Physical domain: measured by the average scores of the extent to which physical pain prevents one from carrying out daily activities, level of energy is available for everyday life, whether participant enjoys enough sleep and whether one is bothered with physical problems relating to HIV/AIDS

Psychological domain: measured by the average score of how often a participant enjoys life, ability to concentrate on targets set, self-satisfaction, acceptance of bodily appearance and frequency of negative feelings such as blue mood and despair.

Level of independence: measured by the average score of a participant's ability to perform daily activities, level of reliance on other medications and satisfaction with strength available for work.

Social relations: measured by the average score of participant's satisfaction with personal relationships with friends and family, support from friends, sexual life and the extent of feeling accepted by people known to infected person.

Environmental domain: measured by the average score of participant's feeling of safety in daily life, satisfaction of conditions of living place, money to meet needs, satisfaction with access to

healthcare, availability of information for everyday life, ability to observe leisure activities, how healthy physical environment is and satisfaction with transport.

Spirituality, religion and personal beliefs domain: measured by the average score of the extent to which life feels meaningful, being bothered by thoughts of getting blamed by people, worry about death and fear of the future.

Overall quality of life: measured by the average scores of responses of participant's rating of their quality of life and satisfaction of health status.

3.6.2 Independent Variables.

The independent variables focused on were socio - demographic factors, level of adherence to medication and psychological factors.

3.6.2.1 Socio- demographic factors

Socio- demographic factors focused on were age, sex, highest level of education, marital status, employment status and average monthly income.

3.6.2.2 Adherence to medication

Adherence to medication was evaluated by using the Simplified Medication Adherence Questionnaire (SMAQ) by the Spanish group Grupo Espan˜ ol para el Estudio Multi-factorial de la Adherencia (GEEMA) (Knobel et al., 2002). The validation of SMAQ, showed a sensitivity of 72% and a specificity of 91%. This section measured adherence based whether patient forgot to take medication, ability to take medication at specified times, stopped taking medication when ill and number of doses missed in a week. This was then grouped into whether participant was adherent or non-adherent.

3.6.2.3 Psychological Factors (Anxiety and Depression)

Psychological function focused on how anxious and depressed a patient had been in the past week; thus, whether normal, on the borderline or abnormal levels. The Hospital Anxiety and Depression Scale (HADS) by Zigmond and Snaith (1983) were used to access anxiety and depression. The anxiety scale has a specificity of 0.78 and sensitivity of 0.90, and for depression, a specificity of 0.79 and a sensitivity of 0.83. Responses were rated A to D, with responses to select from framed according to how questions were asked. The anxiety scale measured feelings of tension, frightened feelings over something awful about to happen, restlessness, worrying thoughts going through one's mind, sudden panic feelings and being at ease and feeling relaxed. The depression scale measured feelings of being slowed down, ability to enjoy things that one used to enjoy, loss of interest in physical appearance, ability to laugh and see the funny side of things, ability to look forward to enjoyment to things, having cheerful feelings and the ability to enjoy a good book, radio or television programme.

3.7 Sampling

3.7.1 Sample Size

Yamane's formula, (Yamane, 1967) for calculating sample size for finite population with a known population size was used in determining the sample size for the study. A 95% confidence interval and p=0.05 was assumed for the equation below.

Using the formula $n = N/ 1+N (e)^2$

Where n= Sample size

N= Population size = the total number of HIV patients attended to at the end of 2017

e= level of precision (0.05)

Substituting the values into the formula,

$n = 4171/ 1+ 4171 (0.05)^2$

n= 365

A 5% adjustment for incomplete questionnaires and non- response was considered and hence 385 patients were to take part in the survey.

3.7.2 Sampling Method

Simple random sampling technique was used for this study. Using the database of the clinic, numbers were assigned to the 4171 patients who were actively attending the ART by the end of 2017 and Microsoft Excel, 2010 was used to generate 385 numbers randomly. The first random 385 numbers generated constituted the sample size. This procedure helped minimize selection bias. Considering the 385 patients selected, whenever one selected patient was not available or refused to take part in the survey, the next number was used. However, 376 patients out of 385 took part in the survey; an acceptable sample size as it exceeded the minimum sample size of 365 patients.

3.8 Data Collection

Data collection was done in three (3) phases.

Phase One (1) – Seek Approval from Data Collection Site

Prior to actual data collection, copies of the proposal and introductory letter taken from the School of Public Health (SPH) to conduct the study were delivered at the administration of the

hospital. Letter was approved and sent to the Public health Department, where a meeting was arranged with the staff of the department. The concept of the study and scope of questionnaire were explained thoroughly to the staff and approval given. Research assistants were introduced to the staff of the Public Health Department after which a date for the start of data collection was agreed on (5th June). An introduction to the staff of the ART centre was done by a staff of the Public health department with the purpose of study communicated.

Phase Two (2) Training of Research Assistants

Data collection was done with the help of two (2) research assistants who were trained on the research topic with emphasis on the objectives of the study, components of the questionnaire and how to approach patients and interpretation of the questionnaire into twi, a local dialect which is understood by a large number of Ghanaians. Mock interviews were done repeatedly between research assistants to ensure consistency and agreement in the translation of the questionnaire in carrying out the interview especially with the translation into twi dialect.

Phase Three (3) Consenting and Interviewing

Data collection was done in one of the offices within the unit where maximum privacy was assured. The selected 385 participants were called and informed periodically to turn up for the survey. The purpose of the survey was thoroughly explained to participants and consent sought before data was collected. A face to face interview with a thorough explanation of questions and answers within each section of the questionnaire after consent has been sought from participant was used in collecting data. Oral translation into local dialect (twi) was done for participants who did not understand english. Each participant averagely spent twenty (20) minutes to be interviewed. Data collection was done from 5th June to 9th August, 2018 using structured and standard questionnaires modified to suit the topic under research.

The questionnaire consisted of four sections, consisting of demographic details on age at las birthday, sex, highest educational level, employment status, marital status and average monthly income. Age was grouped into ranges of 18-27, 28-37, 38-47, 48-57, 58 years and above. Highest educational level was grouped into primary, secondary, tertiary and no education with secondary education referring to junior and senior high education. Marital status was grouped as single, married, divorced, widowed and co-habiting. Average monthly income was grouped into <GH₵500.00, GH₵500.00-GH₵999.00, GH₵1,000.00 -GH₵1,499.00, GH₵1,500.00- GH₵ 1,999.00 and GH₵2,000.00 and above. Employment status was grouped as employed, unemployed and pensioner. The WHOQoL- HIV Bref with six domains was used to access HRQoL, Simplified Medication Adherence Questionnaire (SMAQ) evaluated level of adherence, whiles Hospital Anxiety and Depression Scale (HADS) assessed anxiety and depression status of participants with details as found in section 3.6.

On an average, seven (7) participants were interviewed in a day as some participants wanted to show up on the day they were assigned for review to cut down on cost of transportation.

3.9 Data Processing and Analysis

Each questionnaire was coded, 001, 002 up to 376 to prevent double entry. Data collected was entered into Statistical Package for Social Sciences (SPSS) software version 20 and then exported into Stata version 15. Considering sociodemographic details of participants, age group within the questionnaire was regrouped in three groups (18-37, 38-57 and >57). Marital status was regrouped such that divorced and widowed participants were referred to as ever married and co-habiting participant added up to married participants. Average monthly income was further grouped into two main groups, <GH₵1,000.00 and ≥GH₵1,000.00. Regrouping was done

because some groups had smaller numbers and therefore merged to avoid distorting or masking significant associations. Socio-demographic data was analyzed using descriptive statistics such as frequencies and percentages. The QoL questionnaire was analyzed using mean scores within each domain calculated and subsequently transformed to a scale of 4- 20, using the formula (Domain score/ number of items within the domain) x 4, with a score of four (4) representing the poorest score and twenty (20) representing the best score (Studies, 2006). Overall quality of life which represented the perceived quality of life of patients was analyzed on the basis of whether quality of life was poor or good for each participant and then proportion of participants with good or poor overall quality of life determined ((Karkashadze et al., 2017). For the Simplified Medication Adherence Questionnaire (SMAQ), any answer expressing lack of adherence was an indication of non – adherence. Level of adherence was therefore classified into adherent and non-adherent as sourced by Gruy, (2002). The HADS was analyzed by the addition of the values of each coded response with responses negatively framed questions reversed. A total score of less than 7 implied normal, 8- 10 for borderline abnormal interpreted as a borderline case of anxiety or depression, 11-21 for abnormal (cases) of anxiety and depression levels. Borderline case implying that participant easily stands the risk of becoming a case, thus either a case of anxiety or depression. Anxiety and depression were scored separately (Zigmond and Snaith, 1983).

Relationships between socio- demographic factors (age, sex, highest educational level, marital status, average monthly income and employment status), level of adherence to ARV, psychological variables (anxiety and depression) and HRQoL domains were done using ANOVA and linear regression analysis with statistical significance level set at a 95% confidence interval. Associations between determinants or factors under study and overall quality of life were by

Pearson's chi squared test and logistic regression. For the multiple regression analysis, all factors were controlled for the following reasons:

Advancing age goes with deterioration in physical health, accompanied with fears of the future and hence poor quality of life ((Degroote et al., 2014). Men generally report higher quality of life as socioeconomic, cultural and psychological factors favours men more than women (Picinin et al., 2018). Higher level of education is associated better employment status and better income which has positive influence on health seeking behaviours and therefore better quality of life (Mwesigire, Wu, Martin, Katamba, and Seeley, 2015). Married persons enjoy better companionship as compared to single, widowed or divorced persons. Married persons enjoy physical, emotional and social support from their partners and hence experience good quality of life (Bello and Bello, 2013) . Adherence to medication is one key factor in improving quality of life among HIV positive patients which goes a long way to influence the anxiety and depressive status of PLWHA. Non adherence to medication deteriorates health and hence a pre-requisite for anxiety and depressive status (Marrow, Secreted, and Protect, 2014).

3.10 Quality Control

The questionnaires were pre –tested at La General Hospital which is a district hospital and referral centre as well. Pre- testing was done for twenty (20) participants. Based on the pre- test done, corrections were made to the questionnaire with regards grouping educational level, no education was added as some participants who were pre-tested had no education. Filled questionnaires were kept under lock and key after each day's session of data collection and currently as well. Trained research assistants (a final year student of University of Ghana, School

of Pharmacy (UGSOP) and an unemployed nurse who had just completed rotation) were individuals who had requisite knowledge in the topic of study.

3.11 Ethical Issues

Ethical clearance was sought from the Ghana Health Service – Ethical Review Committee (GHS- ERC). Approval was sought from the school authorities of School of Public Health (SPH). Permission to carry out survey at Ridge Hospital was sought from the Medical Director of the hospital. An informed consent was signed by any patient who consented to take part in the survey. Names of participants were neither written on questionnaires nor recorded in any write up. Data collected was only meant for academic and research purposes. There is no conflict of interest in this study. This research was funded by the principal investigator. Incentives were given to patients who took part in the survey to show appreciation for time spent during interview. Each participant was given handkerchief and hand sanitizers as incentives for taking part in the survey. There were no direct benefits in answering the questionnaire. The indirect benefit would be the policy guidelines that would improve upon the services rendered to HIV positive patients. Depression was a major potential risk as some questions require responses to whether the respondent have had worrying thoughts, frightened feelings and the fear or death in the past few weeks.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio- demographic Characteristics

Data was obtained from 376 HIV positive patients enrolled into the studies, out of which 62.5% of them were females. 31.91% of them were in the age ranges 38 to 47 years. 47.1% of the participants had secondary education. 49.2% of them were currently married while 33.0%, of them were single. 80.9% of them earning on the average, less than Gh₵1,000.00 a month. More information on demographic characteristics of the study participants can be read from table 4.1.

Table 4.1: Sociodemographic characteristics of study participants state location and number (n=376)

Characteristics	Frequency	Percentage
Age group in years		
18-27	41	10.9
28-37	109	28.99
38-47	120	31.91
48-57	65	17.29
58 and above	41	10.9
Sex		
Male	141	37.5
Female	235	62.5
Highest educational level		
No education	46	12.23
Primary	81	21.54
[1]Secondary	177	47.07
Tertiary	72	19.15
Marital status		
Single	124	32.98
Currently married	185	49.2
[2]Ever married	67	17.82
[3]Average Monthly income		
< GhȻ 1,000.00	304	80.85
≥ GhȻ 1,000.00	42	11.17
[4]Employment status		
Employed	324	86.4
Unemployed	43	11.47
Pensioner	8	2.13

[1]secondary: junior and senior high school.[2]Ever married: divorced and widowed. [3]Average monthly income: 30 missing data. [4] Employment status: 1 missing data

4.2 Distribution of Level of Adherence and Psychological Status

From table 4.2, 40.96% (154) of the study participants adhered to their medication. 65.2% (245) and 62.2% (234) of the 376 study participants had normal levels of anxiety and depression respectively. Further details can be found in Table 4.2.

Table 4.2: Distribution of level of adherence and psychological status of participants (n=376)

Characteristics	Frequency	Percentage
Drug adherence		
Adherent	154	40.96
Non-adherent	222	59.04
Anxiety level		
[5]Normal	245	65.16
[6]Borderline abnormal	68	18.09
[7]Abnormal	63	16.75
Depression level		
[5]Normal	234	62.23
[6]Borderline abnormal	94	25.00
[7]Abnormal	48	12.77

[5]Normal: (0-7), [6] borderline abnormal: borderline case of anxiety or depression (8-10).
[7]Abnormal: a case of anxiety or depression (11-21)

4.3 WHOQoL-HIV Bref Domain Mean Scores and Overall QoL

From Table 4.3, the minimum and maximum mean score for each domain was 4 and 20 respectively. The mean score for the physical domain of the WHOQoL-HIV Bref from the 376 study participants was 14.4 (±3.06), while that of the Psychological domain was 13.3 (±3.10). The mean scores were 12.9 (±2.03), 12.2 (±3.08), 13.2 (±2.59) and 14.8 (±3.62) for the independent, social, environmental and spiritual, religion and personal belief (SRBP) domain respectively of the WHOQoL-HIV Bref all on the scale of 4 to 20.

Majority (61.7%) of the study participants perceived their overall quality of life to be of good quality.

Table 4.3: Quality of life of the study participants (n=376)

Outcome measures	Mean	SD	Min	Max
Physical domain	14.36	3.06	4	20
Psychological	13.34	3.10	4	20
Level of Independence	12.86	2.03	4	20
Social Relationship	12.24	3.08	4	20
Environmental	13.23	2.59	4	20
SRPB	14.84	3.62	4	20
Overall quality of life				
Poor	144[a]	38.30[b]		
Good	232[a]	61.70[b]		

SD: (standard deviation). [a] :frequency. [b] :percentage

4.4 Test of Association between Determinants and WHOQoL- HIV Bref Domains and Overall Quality of Life.

The One-way ANOVA test was used in testing the equality of means scores of the six WHOQoL-HIV Bref domains between the various categories of determinants of study participants at 95% confidence interval.

4.4.1Test of Association between Determinants and WHOQoL-HIV Bref (Physical and Psychological Domains)

4.4.1.1 Physical Domain

Highest level of highest educational level, monthly income, anxiety and depression levels were the determinants that showed significant association with the physical domain score of the study participants all at p value < 0.001 (Table 4.4a).

Those participants with secondary level of education had the highest physical domain mean scores (14.73 ± 2.86) while those with tertiary as their highest level of education had the lowest physical domain scores. (13.00±3.23). Among the levels of average monthly income, those study

participants with average monthly income below Gh₵ 1000.00 had the highest physical domain mean score (14.66 ± 2.83) and then those who earn Gh₵ 1000.00 or more with 12.55 (±3.54). Participants with normal levels of both anxiety (15.53±2.67) and depression (15.64±2.50 also had significantly higher physical domain scores with the least score reported by those with abnormal cases of both anxiety (11.08±2.80) and depression (10.96±3.36) at p-value <0.001.

4.4.1.2 Psychological Domain

Age group (p value=0.013), highest level of education (p value =0.007), average monthly income (p- value<0.001) and employment status (p- value = 0.024), anxiety (p-value<0.001) and depression levels (p-value<0.001) of the study participants were the determinants that showed significant association with the psychological domain (Table 4.4a).

Participants within the age range of 38-57 had the highest mean score in the psychological domain with 13.80 ± 3.22 mean scores. Similar to the physical domain scores, those study participants with secondary level of education had the highest mean psychological domain score with 13.72±2.75 and the lowest by participants with tertiary education having psychological domain scores of 12.27±3.79. For average monthly income, the category with the highest psychological domain means score was those who earn less than GH₵1000.00 monthly (13.65 ± 2.72). The least psychological domain score was reported by participants who earn more than GH₵1,000 (11.70±4.42). Participants who were employed had the highest mean score (13.50 ±2.99) under the psychological domain whiles pensioners had least domain score (11.40±3.57).

Participants with normal levels of anxiety (14.55 ± 2.47) and depression (14.69 ± 2.13) had higher psychological domain mean scores as compared to abnormal levels of anxiety (10.06 ± 3.59) and depression (9.28 ± 3.84).

Table 4.4a: One-way ANOVA test between determinants and WHOQoL- HIV Bref (Physical and Psychological domains) n=376

	Physical domain		Psychological domain	
Characteristics	**Mean ± SD**	**F-stat; P-value**	**Mean ± SD**	**F-stat; P-value**
Age group in years		2.77; 0.064		4.36; **0.013**
18-37	13.99 ± 2.78		12.81 ± 2.8	
38-57	14.74 ± 3.16		13.80± 3.22	
> 57	14.02 ± 3.44		13.21 ± 3.35	
Sex		1.9; 0.169		0.71; 0.401
Male	14.08 ± 2.92		13.17 ± 3.14	
Female	14.53 ± 3.14		13.45 ± 3.08	
Highest educational level		6.13; **<0.001**		4.14; **0.007**
No education	14.57 ± 3.69		13.11 ± 3.59	
Primary	14.64 ± 2.65		13.60 ± 2.65	
[1]Secondary	14.73 ± 2.86		13.72 ± 2.75	
Tertiary	13.00 ± 3.23		12.27 ± 3.79	
Marital status		0.14; 0.869		0.26; 0.77
Single	14.25 ± 2.99		13.41 ± 2.79	
Currently married	14.44 ± 3.07		13.23 ± 3.35	
[2]Ever married	14.34 ± 3.23		13.53 ± 2.99	
[3]Average Monthly income		9.6; **<0.001**		8.79; **<0.001**
< Gh₵ 1,000.00	14.66 ± 2.83		13.65 ± 2.72	
≥ Gh₵ 1,000.00	12.55 ± 3.54		11.70 ± 4.42	
[4]Employment status		2.17; 0.116		3.76; **0.024**
Employed	14.48 ± 2.98		13.50 ± 2.99	
Unemployed	13.58 ± 3.63		12.47 ± 3.65	
Pensioner	13.25 ± 2.31		11.40 ± 3.57	
Drug adherence		0.18; 0.674		0.01; 0.924
Adherent	14.28±2.68		13.36±2.55	
Non-adherent	14.41 ± 3.31		13.33 ± 3.44	
Anxiety level		85.31; **<0.001**		87.68; **<0.001**
[5]Normal	15.53 ± 2.67		14.55 ±	

			2.47	
[6]Borderline abnormal	13.19 ± 1.70		12.04 ± 1.60	
[7]Abnormal	11.08 ± 2.80		10.06 ± 3.59	
Depression level		88.6; **<0.001**		114.9; **<0.001**
[5]Normal	15.64 ± 2.50		14.69 ± 2.13	
[6]Borderline abnormal	12.91 ± 2.07		12.05 ± 2.28	
[7]Abnormal	10.96 ± 3.36		9.28 ± 3.84	

SD: Standard deviation.[1]secondary: junior and senior high school. [2]Ever married: divorced and widowed.[3]Average monthly income: 30 missing data. [4] Employment status: 1 missing data. [5]Normal: (0-7) no case of anxiety or depression, [6] borderline abnormal: borderline case of anxiety or depression (8-10). [7]Abnormal: a case of anxiety or depression (11-21)

4.4.2: Test of Association between determinants and the WHOQoL – Bref (Independence and Social Relationship Domains)

4.4.2.1: Level of Independence Domain

From Table 4.4b, age group (p- value<0.001), employment status (p- value=0.01) and then at a p-value of <0.001, anxiety and depression levels were determinants that showed significant associations with level of independence domain scores.

The study participants in the 38 to 57 years age range (13.28 ± 1.98) had the maximum mean score in the level of independence domain mean scores than those in the 18 to 37 age range reporting the least (12.36 ± 1.95). Those participants in the employed category had the highest independent domain mean scores (12.98 ± 1.97) with those on pension having the least independent domain mean scores (12.0 ± 2.0).

Participants with normal levels of both anxiety (13.65±1.54) and depression (13.71±1.48) also had significantly higher level of independence domain scores compared to abnormal cases of both anxiety(10.87±2.37) and depression (10.96±3.36).

4.4.2.2: Social Relationship Domain

Age group (p=0.001), average monthly income (p=0.017), anxiety (p<0.001) and depression levels (p<0.001) of the HIV positive patients were the determinants that showed significant association with social relationship domain scores (Table 4.4b).

Study participants in the age range 38 to 57 years inclusive had the highest social relationship domain mean scores (12.82 ± 3.18) with 18 to 37 years reporting the lowest mean domain scores (11.61±2.79). Those participants who earned at most a GH₵1000.00 monthly had the highest social relationship with the least score reported by participants who earn greater than GH₵1,000domain (11.14±4.03). Normal levels of anxiety (13.40±2.57) and depression (13.42±2.50) reported highest social dependence domain scores than the abnormal levels of anxiety (9.16±3.14) and depression (9.28±3.84).

Table 4.4b: One-way ANOVA test of Determinants and WHOQoL-HIV Bref (Level of Independence and Social domains) n=376

	Level of Independence domain		Social Relationship domain	
Characteristics	**Mean ± SD**	**F-stat; P-value**	**Mean ± SD**	**F-stat; P-value**
Age group in years		8.79; **<0.001**		6.87; **0.001**
18-37 years	12.36 ± 1.95		11.61 ± 2.79	
38-57 years	13.28 ± 1.98		12.82 ± 3.18	
>57 years	12.83 ± 2.18		11.93 ± 3.25	
Sex		1.05; 0.307		2.51; 0.114
Male	12.72 ± 2.16		11.91 ± 3.23	
Female	12.94 ± 1.95		12.43 ± 2.98	
Highest educational level		2.57; 0.054		2.19; 0.089
No education	12.39 ± 2.46		11.91 ± 3.51	
Primary	12.89 ± 1.54		11.90 ± 2.98	
[1]Secondary	13.12 ± 1.86		12.67 ± 2.83	
Tertiary	12.50 ± 2.49		11.78 ± 3.43	
Marital status		0.66; 0.516		1.62; 0.199
Single	12.79 ± 2.01		11.89 ± 2.78	
Currently married	12.82 ± 2.04		12.52 ± 3.25	
[2]Ever married	13.12 ± 2.05		12.12 ± 3.13	
[3]Average Monthly income		1.93; 0.147		4.1; **0.017**
< GhC 1,000.00	12.96 ± 1.91		12.45 ± 2.86	
≥ GhC 1,000.00	12.50 ± 2.73		11.14 ± 4.03	
[4]Employment status		4.62; **0.01**		1.02; 0.361
Employed	12.98 ± 1.97		12.33 ± 3.05	
Unemployed	12.07 ± 2.20		11.70 ± 3.37	
Pensioner	12.00 ± 2.00		11.50 ± 3.07	
Drug adherence		2.7; 0.102		0.08; 0.782
Adherent	12.66 ± 1.78		12.29 ± 2.61	
Non-adherent	13.00 ± 2.18		12.20 ± 3.38	
Anxiety level		82; **<0.001**		77; **<0.001**
[5]Normal	13.65 ± 1.54		13.40 ± 2.57	
[6]Borderline abnormal	11.85 ± 1.47		10.93 ± 2.11	
[7]Abnormal	10.87 ± 2.37		9.16 ± 3.14	
Depression level		88.6; **<0.001**		114.9; **<0.001**
[4]Normal	15.64 ± 2.50		14.69 ± 2.13	
[5]Borderline abnormal	12.91 ± 2.07		12.05 ± 2.28	
[6]Abnormal	10.96 ± 3.36		9.28 ± 3.84	

SD: Standard deviation. SD: Standard deviation.[1]secondary: junior and senior high school. [2]Ever married: divorced and widowed.[3]Average monthly income: 30 missing data. [4] Employment status: 1 missing

data. [5]Normal: (0-7) no case of anxiety or depression, [6] borderline abnormal: borderline case of anxiety or depression (8-10). [7]Abnormal: a case of anxiety or depression (11-21)

4.4.3: Test of Association between Determinants and WHOQoL-HIV Bref (Environmental and Spiritual, Religion and Personal Belief Domain)

4.4.3.1: Environmental Domain

Age (p- value=0.005), average monthly income (p-value=0.012) and a p value <0.001 for anxiety and depression levels, were the determinants or factors that showed significant association with the environmental domain score (Table 4.4c).

Study participants in the age range 38 to 57 years inclusive had the highest environmental domain mean scores (13.62±2.46) with 18-37 age range reporting the lowest domain score (12.71±2.56). For the average monthly income categories, those study participants who earn less than GH₵1,000.00 monthly had the highest environmental domain scores (13.4 ± 2.4) with those earning greater than GH₵1,000 reporting the lowest environmental domain score (12.45±2.82). Participants with normal levels of both anxiety (14.32±1.98) and depression (14.47±1.8) also had significantly higher environmental domain scores compared to those with abnormal levels of both anxiety (10.67±2.96) and depression 9.63±2.53).

4.4.3.2: Spiritual, Religion and Personal Belief (SRPB) Domain

From Table 4.4c, highest level of education (p- value<0.001), average monthly income (p- value <0.001), drug adherence (p- value=0.002), anxiety (p<0.001) and depression (p<0.001) levels of the HIV positive patients were the factors that showed significant association with WHOQoL-HIV SRPB domain scores.

The highest SRPB domain mean scores were recorded among those study participants with secondary level of education (15.51±3.08). Those study participants with tertiary level of

education had the least SRPB domain mean score (13.36 ± 4.73). Study participants who earned less than GH₵1,000.00 cedis monthly ((15.14 ± 3.03) had the highest SRPB domain mean score with the lowest reported by those who earn greater than GH₵1,000.00 (12.74±5.40). Participants who were adherent to medication (15.52 ± 2.74) reported a higher SRPB domain score than non-adherent participants (14.36 ± 4.06). Participants with normal levels of anxiety (15.92 ± 2.68) and depression (15.89 ± 2.58) reported higher SRPB domain scores as compared with abnormal levels of anxiety (10.30 ± 4.60) and depression (9.60 ± 4.81).

Table 4.4c: One-way ANOVA test between Determinants and WHOQoL-HIV Bref (Environmental and SRPB) domains (n=376)

	Environmental domain		SRPB domain	
Characteristics	**Mean ± SD**	**F-stat; P-value**	**Mean ± SD**	**F-stat; P-value**
Age group in years		5.38; **0.005**		1.25; 0.289
18-37	12.71 ± 2.56		14.49 ± 3.48	
38-57	13.62 ± 2.46		15.11 ± 3.54	
>57	13.37 ± 2.93		14.88 ± 4.39	
Sex		3.70; 0.055		0.10; 0.749
Male	12.90 ± 2.61		14.91 ± 3.86	
Female	13.43 ± 2.55		14.79 ± 3.48	
Highest educational level		2.41; 0.067		6.41; **<0.001**
No education	12.86 ± 3.19		14.57 ± 4.31	
Primary	13.42 ± 2.34		14.83 ± 2.70	
[1]Secondary	13.49 ± 2.46		15.51 ± 3.08	
Tertiary	12.62 ± 2.65		13.36 ± 4.73	
Marital status		0.37; 0.693		1.69; 0.186
Single	13.08 ± 2.66		14.54 ± 3.56	
Currently married	13.28 ± 2.56		15.18 ± 3.51	
[2]Ever married	13.39 ± 2.53		14.43 ± 3.97	
[3]AverageMonthly income		4.51; **0.012**		8.45; **<0.001**
< GhC 1,000.00	13.42 ± 2.41		15.14 ± 3.03	
≥ GhC 1,000.00	12.45 ± 2.82		12.74 ± 5.40	
[4]Employment status		3.02; 0.05		1.33; 0.266
Employed	13.35 ± 2.42		14.94 ± 3.37	
Unemployed	12.38 ± 3.48		14.00 ± 4.96	
Pensioner	12.50 ± 2.69		14.50 ± 4.60	
Drug adherence		1.03; 0.31		9.46; **0.002**
Adherent	13.07 ± 2.21		15.52 ± 2.74	
Non-adherent	13.34 ± 2.82		14.36 ± 4.06	
Anxiety level		97.95; **<0.001**		89.2; **<0.001**
[5]Normal	14.32 ± 1.98		15.92 ± 2.68	
[6]Borderline abnormal	11.70 ± 1.48		15.15 ± 1.99	
[7]Abnormal	10.67 ± 2.96		10.30 ± 4.60	
Depression level		153.15; **<0.001**		87.93; **<0.001**
[5]Normal	14.47 ± 1.80		15.89 ± 2.58	
[6]Borderline abnormal	11.98 ± 1.86		14.89 ± 2.75	
[7]Abnormal	9.63 ± 2.53		9.60 ± 4.81	

SD: Standard deviation.[1]secondary: junior and senior high school. [2]Ever married: divorced and widowed.[3]Average monthly income: 30 missing data. [4] Employment status: 1 missing data. [5]Normal: (0-7) no case of anxiety or depression, [6] borderline abnormal: borderline case of anxiety or depression (8-10). [7]Abnormal: a case of anxiety or depression (11-21)

4.4.4 Test of Association between of Determinants and Overall Quality of Life

From Table 4.4d, the Pearson's chi-square test of association between determinants and overall quality of life, showed age group (p -value= 0.021), employment status (p- value=0.015) with anxiety and depression levels all significant at a p value <0.001 as determinants that showed significant association with the overall quality of life of the HIV positive patients.

Among the age groups, the age range with a higher proportion of them having good overall quality of life was those in the 38 to 57 years range inclusive (68.11%,126 out of 185) with the age range >57 years reporting the least proportion of HIV patients with good overall quality of life (63.41%, 26 out of 41). For employment status, participants who were employed (64.20%, 208 out of 324) had significantly the highest proportion of them having good overall quality of life with the least proportion reported by pensioners (2%, 2 out of 8).

Significantly higher proportion of participants with normal levels of anxiety (80.82%, 198 out of 245) and depression (81.62%, 191 out of 234) perceived their life to be of good quality with the least proportion reported by participants with abnormal levels of anxiety (15.87%, 10 out of 63) and depression (8.33%, 4 out of 48) respectively. (Table 4.4d)

Table 4.4d: Test of association between determinants and overall quality of life (n=376)

Characteristics	Total	Overall QoL		χ^2-value ; P-value
		Poor (%)	Good (%)	
Age group in years				7.71; **0.021**
18-37 years	150	70 (46.67)	80 (53.33)	
38-57 years	185	59 (31.89)	126 (68.11)	
> 57 years	41	15 (36.59)	26 (63.41)	
Sex				3.07; 0.08
Male	141	62 (43.97)	79 (56.03)	
Female	235	82 (34.89)	153 (65.11)	
Highest educational level				5.50; 0.139
No education	46	18 (39.13)	28 (60.87)	
Primary	81	29 (35.80)	52 (64.20)	
[1]Secondary	177	61 (34.46)	116 (65.54)	
Tertiary	72	36 (50.00)	36 (50.00)	
Marital status				0.67; 0.716
Single	124	50 (40.32)	74 (59.68)	
Currently married	185	67 (36.22)	118 (63.78)	
[2]Ever married	67	27 (40.30)	40 (59.70)	
[3]Average monthly income				4.09; 0.129
< Gh₵ 1,000.00	304	109 (35.86)	195 (64.14)	
≥ Gh₵ 1,000.00	42	21 (50.00)	21 (50.00)	
[4]Employment status				8.42; **0.015**
Employed	324	116 (35.8)	208 (64.2)	
Unemployed	43	22 (51.16)	21 (48.84)	
Pensioner	8	6 (75.00)	2 (25.00)	
Drug adherence				0.42; 0.515
Adherent	154	62 (40.26)	92 (59.74)	
Non -Adherent	222	82 (36.94)	140 (63.06)	
Anxiety level				113.94; **<0.001**
[5]Normal	245	47 (19.18)	198 (80.82)	
[6]Borderline abnormal	68	44 (64.71)	24 (35.29)	
[7]Abnormal	63	53 (84.13)	10 (15.87)	
Depression level				117.01; **<0.001**
[5]Normal	234	43 (18.38)	191 (81.62)	
[6]Borderline abnormal	94	57 (60.64)	37 (39.36)	
[7]Abnormal (case)	48	44 (91.67)	4 (8.33)	

χ2-value: Pearson's chi-square value. [1]secondary: junior and senior high school. [2]Ever married: divorced and widowed.[3]Average monthly income: 30 missing data. [4] Employment status: 1 missing data. [5]Normal: (0-7) no case of anxiety and depression, [6] borderline abnormal: borderline case of anxiety or depression (8-10). [7]Abnormal: a case of anxiety or depression (11-21).

4.5 Test of Multiple Regression Analysis of all Determinants on WHO-QoL HIV Bref Domains and Overall Quality of Life

The multiple regression analysis was used in quantifying the adjusted level of influence of all determinants on the domains of the WHOQoL- HIV Bref and overall quality of life at 95% confidence interval. Multilinear regression analysis was used to in quantifying the influence of all determinants on WHOQoL –HIV Bref domains (continuous variables) whiles logistic regression was used to quantify the influence of all determinants on overall quality of life.

4.5.1 Multiple Linear Regression Analysis of all Determinants on WHOQoL- HIV Bref Domains (Physical and Psychological Domains)

Physical domain

Age group in years (p-value =0.023), anxiety level (p-value<0.001) and depression level (p value<0.001) were the factors that had significant influence on the WHOQoL- HIV Bref physical domain scores from the multiple linear regression model (adjusted model).

Participants in the age group above 57 years had significantly on the average -1.36 (95% CI: [-2.38, -0.33]) decreased scores in the WHOQoL physical domain when compared to those in the age group 18-37 years. On the average participants with borderline abnormal and abnormal (cases) of anxiety had a 1.57 (95% CI: [-2.28, -0.85]) and 2.75 (95% CI: [-3.60, -1.91]) decreased physical domain scores respectively when both are compared to those with normal anxiety level. Also, on the average participants with borderline normal and abnormal (cases) of depression had a 1.94 (95% CI: -2.57, -1.31]) and 2.60 (95% CI: [-3.53, -1.67]) decrease physical domain scores respectively when both are being compared to those with normal levels of depression. (Table 4.5a)

Psychological domain

Anxiety and depression levels, both at a p-value of <0.001 were the factors that showed significant influence on the WHOQoL-HIV Bref psychological domains of HIV positive patients from the multiple linear regression model (adjusted model).

Participants with borderline abnormal and abnormal (case) of anxiety had a 1.58 (95% CI: [-2.28, -0.87]) and 2.23 (95% CI: [-3.06, -1.40]) decrease psychological domain scores respectively when both are being compared to those with normal levels of anxiety. Also, on the average participants with borderline abnormal and abnormal levels of depression had a 1.86 (95% CI: [-2.48, -1.24]) and 3.61 (95% CI: [-4.52, -2.70]) decrease psychological domain scores respectively when both are being compared to those with normal levels of anxiety. (Table 4.5a).

Table 4.5a: Multiple linear regression of determinants on the Physical and Psychological domains of the WHOQoL- HIV Bref

	Physical domain		Psychological domain	
Characteristics	**aβ (95% CI)**	**P-value**	**aβ (95% CI)**	**P-value**
Age group in years		**0.023**		0.148
18-37 years	0.00 (ref)		0.00 (ref)	
38-57 years	-0.10 (-0.71, 0.51)		0.40 (-0.20, 1.00)	
> 57 years	-1.36 (-2.38, -0.34)		-0.37 (-1.38, 0.63)	
Sex		0.951		0.740
Male	0.00 (ref)		0.00 (ref)	
Female	0.02 (-0.51, 0.54)		-0.86 (-0.60, 0.43)	
Highest educational level		0.409		0.658
No education	0.00 (ref)		0.00 (ref)	
Primary	-0.20 (-1.10, 0.69)		0.32 (-0.56, 1.21)	
[1]Secondary	-0.13 (-0.94, 0.67)		0.47 (-0.32, 1.27)	
Tertiary	-0.74 (-1.75, 0.26)		0.23 (-0.76, 1.21)	
Marital status		0.701		0.154
Single	0.00 (ref)		0.00 (ref)	
Currently married	0.17 (-0.44, 0.78)		-0.45 (-1.04, 0.15)	
[2]Ever married	0.34 (-0.46, 1.15)		0.12 (-0.67, 0.91)	
[3] AverageMonthly income		0.095		0.089
< Gh₵ 1,000.00	0.00 (ref)		0.00 (ref)	
≥ Gh₵ 1,000.00	-1.10 (-2.79, 0.60)		-0.79 (-2.46, 0.88)	
[4]Employment status		0.707		0.393
Employed	0.00 (ref)		0.00 (ref)	
Unemployed	-0.31 (-1.5, 0.93)		-0.31 (-1.52, 0.90)	
Pensioner	0.61 (-1.26, 2.48)		-1.22 (-3.06, 0.62)	
Drug adherence		0.340		0.718
Adherent	0.00 (ref)		0.00 (ref)	
Non Adherent	0.25 (-0.264, 0.77)		0.09 (-0.41, 0.60)	
Anxiety level		**<0.001**		**<0.001**
[5]Normal	0.00 (ref)		0.00 (ref)	
[6]Borderline abnormal	-1.57 (-2.28, -0.85)		-1.58 (-2.28, -0.87)	
[7]Abnormal	-2.75 (-3.60, -1.91)		-2.23 (-3.07, -1.40)	
Depression level		**<0.001**		**<0.001**
[5]Normal	0.00 (ref)		0.00 (ref)	
[6]Borderline abnormal	-1.94 (-2.58, -1.31)		-1.86 (-2.48, -1.24)	
[7]Abnormal	-2.60 (-3.53, -1.67)		-3.61 (-4.52, -2.70)	

aβ: adjusted coefficient. CI: confidence interval. SD: Standard deviation.[1]secondary: junior and senior high school. [2]Ever married: divorced and widowed.[3]Average monthly income: 30 missing data. [4] Employment status: 1 missing data. [5]Normal: (0-7) no case of anxiety and depression, [6] borderline abnormal: borderline case of anxiety or depression (8-10). [7]Abnormal: a case of anxiety or depression (11-21)

4.5.2 Multiple Linear Regression Analysis of determinants on WHOQoL- HIV Bref Domains (Level of Independence and Social Relationship Domains)

Level of Independence domain

Age (p-value= 0.005), highest educational level (p- value= 0.029), marital status (p-value =0.019), drug adherence (p-value=0.026), anxiety (p-value< 0.001) and depression level (p=value <0.001) were the factors that had significant influence on the WHOQoL level of independence domain scores from the multiple linear regression model (adjusted model).

Participants who were within the age range of 38-57 had on an average 0.52 (95%CI: [0.13, 0.91]) increase in their level of independence domain score when compared to those within 18-37 years age group. Participants with secondary and tertiary education as their highest level of education had on an average 0.74 (95%CI: [0.23, 1.26]) and 0.84 (95%CI: [0.19, 1.49]) increase in the level of independence domain score respectively when compared with participants with no education. Also, participants who were ever married had 0.27 (95%CI: [0.04, 0.78]) increase in their level of independence domain score, whiles those who were currently married had 0.33 (95%CI: [-0.72, -0.06]) decreased level of independence domain score as compared with those who were single.

Participants who were non-adherent to medication had on the average a 0.38 (95% CI: [0.05, 0.71]) increase in their level of independence domain scores when compared to those who were adherent to medication. Participant who had borderline abnormal and abnormal levels of anxiety had on the average 1.05 (95% CI: [-1.51, -0.58]) and 1.48 (95%CI: [-2.03, -0.94]) decrease in their level of independence domain scores respectively when compared to those with normal level of anxiety. Also, those with borderline and abnormal levels of depression had on average had a 1.06 (95% CI: [-1.46, -0.65]) and 2.28 (95% CI: [-2.88, -1.69]) decrease in their level of

independence domain scores respectively when both are compared to those with normal level of depression. (Table 4.5b)

Social Relationship domain

Age group in years (p-value= 0.016), highest educational level (p-value= 0.031), anxiety (p-value <0.001) and depression level (p-value< 0.001) were the factors that showed significant influence on the WHOQoL-HIV Bref social relationship domain of HIV positive patients from the multiple linear regression model (adjusted model).

HIV patients within the age group 38-57 years had on the average 0.56 (95% CI: [0.06, -1.18]) decrease social relationship domain scores when compared to those in the age group 18 to 37 years. Participants with secondary and tertiary educational level had on an average 0.66 (95%CI: [0.17, 1.49]) and 0.89 (95%CI: [0.14, 1.92]) increase in their social relationship domain score respectively as compared with participants with no education.

Participants with borderline abnormal and abnormal levels of anxiety had on the average a 1.85 (95% CI: [-2.59, -1.11]) and 2.77 (95% CI: [-3.63, -1.90]) reduced social relationship domain scores respectively when both were compared to those with normal level of anxiety. Also, those study participants with borderline abnormal and abnormal levels of depression had on the average a 1.28 (95% CI: [-1.93, -0.63]) and 2.80 (95% CI: [-3.76, -1.85]) reduced social relationship domain scores respectively when both are compared to those with normal levels of depression. (Table 4.5b).

Table 4.5b: Multiple linear regression analysis of determinants on level of independence and social relationship domain of the WHOQoL-HIV Bref

	Level of Independence domain		Social Relationship domain	
Characteristics	**aβ (95% CI)**	**P-value**	**aβ (95% CI)**	**P-value**
Age group in years		**0.005**		**0.016**
18-37 years	0.00 (ref)		0.00 (ref)	
38-57 years	0.52 (0.13, 0.91)		0.56 (0.06, 1.18)	
> 57 years	-0.22 (-0.88, 0.43)		-0.69 (-1.75, 0.35)	
Sex		0.340		0.221
Male	0.00 (ref)		0.00 (ref)	
Female	0.15 (-0.19, 1.49)		0.34 (-0.20, 0.87)	
Highest educational level		**0.029**		**0.031**
No education	0.00 (ref)		0.00 (ref)	
Primary	0.51 (-0.63, 1.09)		-0.16 (-1.09, 0.76)	
[1]Secondary	0.74 (0.23, 1.26)		0.66 (0.17, 1.49)	
Tertiary	0.84 (0.19, 1.49)		0.89 (0.14, 1.92)	
Marital status		**0.019**		0.327
Single	0.00 (ref)		0.00 (ref)	
Currently married	-0.33 (-0.72, -0.06)		0.47(-0.15, 1.10)	
[2]Ever married	0.27 (0.04, 0.78)		0.29(-0.54, 1.12)	
[3]AverageMonthly income		0.350		0.180
< Gh₵ 1,000.00	0.00 (ref)		0.00 (ref)	
≥ Gh₵ 1,000.00	-0.71 (-1.8, 0.37)		0.02(-1.72, 1.77)	
[4]Employment status		0.074		0.552
Employed	0.00 (ref)		0.00 (ref)	
Unemployed	-0.88 (-1.68, -0.08)		0.66 (-0.61, 1.93)	
Pensioner	-0.49 (-1.68, 0.71)		0.43 (-1.49, 2.36)	
Drug adherence		**0.026**		0.825
Adherent	0.00 (ref)		0.00 (ref)	
Non - Adherent	0.38 (0.05, 0.71)		-0.06 (-0.59, 0.47)	
Anxiety level		**<0.001**		**<0.001**
[5]Normal	0.00 (ref)		0.00 (ref)	
[6]Borderline abnormal	-1.05 (-1.51, -0.58)		-1.85 (-2.59, -1.11)	
[7]Abnormal	-1.48 (-2.03, -0.94)		-2.77 (-3.63, -1.90)	
Depression Level		**<0.001**		**<0.001**
[5]Normal	0.00 (ref)		0.00 (ref)	
[6]Borderline abnormal	-1.06 (-1.46, -0.65)		-1.28 (-1.93, -0.63)	
[7]Abnormal	-2.28 (-2.88, -1.69)		-2.80 (-3.76, -1.85)	

aβ: adjusted coefficient. CI: confidence interval. SD: Standard deviation.[1]secondary: junior and senior high school. [2]Ever married: divorced and widowed.[3]Average monthly income: 30 missing data. [4] Employment status: 1 missing data. [5]Normal: (0-7) no case of anxiety and depression, [6] borderline abnormal: borderline case of anxiety or depression (8-10). [7]Abnormal: a case of anxiety or depression (11-21)

4.5.3 Multiple Linear Regression Model of Determinants on WHO-QoL HIV Bref Domains (Environmental and Spiritual, Religion and Personal Belief (SRPB) Domains)

Environmental domain

Anxiety and depression level both at p-value of <0.001 were the factors that had significant influence on the WHOQoL-HIV Bref environmental domain scores from the multiple linear regression models (adjusted model).

On the average participants with borderline abnormal and abnormal levels of anxiety had a 1.64 (95% CI: [-2.20, -1.09]) and 1.56 (95% CI: [-2.21, -0.91]) decrease in environmental domain scores respectively when both are compared to those with normal anxiety level. Also on the average participants with borderline abnormal and abnormal levels of depression had a 1.74 (95% CI: [-2.23, -1.26]) and 3.64 (95% CI: [-4.39, -2.96]) decrease in environmental domain scores respectively when both are being compared to those with normal levels of anxiety. (Table 4.5c)

Spiritual, Religion and Personal Belief (SRPB) domain

Anxiety and depression level both at a p- value of <0.001were the factors that showed significant influence on the WHOQoL-HIV Bref SRBP domain from the multiple linear regression model (adjusted model).

Participants with borderline abnormal and abnormal levels of anxiety had a 1.70 (95% CI: [-2.25, -0.15]) and -3.62 (95% CI: [-4.62, -2.62]) decrease in SRPB domain scores when compared to those with normal levels of anxiety. Also on the average participants with borderline abnormal and abnormal levels of depression had a 0.35 (95% CI: -1.10, -0.39]) and 3.66(95% CI: [-4.55, -2.57]) decrease in SRPB domain scores respectively when both are being compared to those with normal levels of depression. (Table 4.5c).

Table 4.5c: Multiple linear regression analysis of determinants on Environmental and Spiritual, Religion and Personal Belief (SRPB) domains of the WHOQoL-HIV Bref.

	Environmental Domain		SRPB domain	
Characteristics	**aβ (95% CI)**	**P-value**	**aβ (95% CI)**	**P-value**
Age group in years		0.373		0.455
18-37 years	0.00 (ref)		0.00 (ref)	
38-57 years	0.18 (-0.29, 0.65)		-0.14 (-0.85, 0.57)	
> 57 years	-0.30 (-1.08, 0.49)		-0.76 (-1.97, 0.44)	
Sex		0.065		0.159
Male	0.00 (ref)		0.00 (ref)	
Female	0.38 (-0.23, 0.78)		-0.44 (-1.06, 0.17)	
Highest educational level		0.389		0.197
No education	0.00 (ref)		0.00 (ref)	
Primary	0.54 (-0.15, 1.23)		-0.54 (-1.60, 0.51)	
[1]Secondary	0.53 (-0.09, 1.14)		0.22 (-0.73, 1.17)	
Tertiary	0.50 (-0.27, 1.28)		-0.34 (-1.53, 0.84)	
Marital status		0.560		0.247
Single	0.00 (ref)		0.00 (ref)	
Currently married	0.01(-0.46, 0.48)		0.60 (-0.12, 1.31)	
[2]Ever married	0.29 (-0.33, 0.91)		-0.34 (-1.53, 0.84)	
[3]Average Monthly income		0.735		0.245
< GhȻ 1,000.00	0.00 (ref)		0.00 (ref)	
≥ GhȻ 1,000.00	0.16 (-1.16, 1.46)		-1.61 (-3.61, 0.39)	
[4]Employment status		0.923		0.738
Employed	0.00 (ref)		0.00 (ref)	
Unemployed	-0.18 (-1.12, 0.77)		-0.86 (-2.50, 0.77)	
Pensioner	-0.13 (-1.58, 1.31)		-1.61 (-3.61, 0.39)	
Drug adherence		0.22		0.142
Adherent	0.00 (ref)		0.00 (ref)	
Non - Adherent	0.25 (-0.15, 0.64)		-0.46 (-1.06, 0.15)	
Anxiety level		**<0.001**		**<0.001**
[5]Normal	0.00 (ref)		0.00 (ref)	
[6]Borderline abnormal	-1.64 (-2.20, -1.09)		-1.70 (-2.25, -0.15)	
[7]Abnormal	-1.56 (-2.21, -0.91)		-3.62 (-4.62, -2.62)	
Depression Level		**<0.001**		**<0.001**
[5]Normal	0.00 (ref)		0.00 (ref)	
[6]Borderline abnormal	-1.74(-2.23, -1.26)		-0.35, (-1.10, -0.39)	
[7]Abnormal	-3.67 (-4.39, -2.96)		-3.66, (-4.76, -2.57)	

aβ: adjusted coefficient. CI: confidence interval. SD: Standard deviation.[1]secondary: junior and senior high school. [2]Ever married: divorced and widowed.[3]Average monthly income: 30 missing data from average monthly income. [4] Employment status: 1 missing data. [5]Normal: (0-7) no case of anxiety and depression, [6]borderlines abnormal: borderline case of anxiety or depression (8-10). [7]Abnormal: a case of anxiety or depression (11-21).

4.5.4 Logistic regression Model of all Determinants on Overall Quality of Life.

From Table 4.5d, the simple binary logistic regression model (unadjusted model), age group in years (p- value=0.022), employment status (p- value= 0.023), anxiety (p-value<0.001) and depression (p-value <0.001)levels were the factors that showed significant influence on the overall quality of life of the HIV patients at a 95% confidence interval. From the multiple binary logistic regression model (adjusted model), anxiety and depression levels, both at a p-value of <0.001 were the only factors that showed significant influence on the overall quality of life of the HIV positive patients at 95% confidence interval.

The odds from the adjusted model of HIV patients with borderline abnormal and abnormal anxiety levels having good overall (perceived) quality of life were 78% and 86% less when compared to one with normal anxiety level (aOR: 0.22, 95% CI: [0.11, 0.44]) and (aOR: 0.14, 95% CI: [0.06-0.33]) respectively.

Also, the odds from the adjusted model of an HIV patients with borderline abnormal and abnormal levels of depression having good overall (perceived) quality of life were 75% and 95% less when compared to normal anxiety level (aOR: 0.25, 95% CI: [0.13-0.45]) and

(aOR: 0.03, 95% CI: [0.02-0.17]) respectively. (Table 4.5d).

Table 4.5d: Determinants of Overall Quality of Life among HIV patients

	Unadjusted binary logistic model		Adjusted binary logistic model	
Characteristics	**uOR (95% CI)**	**P-value**	**aOR (95% CI)**	**P-value**
Age group in years		**0.022**		0.883
18-37 years	1.00		1.00	
38-57 years	1.87 (1.2, 2.92)		1.18 (0.59, 2.32)	
> 57 years	1.52 (0.74, 3.09)		1.01 (0.31, 3.39)	
Sex		0.08		0.210
Male	1.00		1.00	
Female	1.46 (0.96, 2.24)		1.46 (0.80, 2.65)	
Highest educational level		0.144		0.963
No education	1.00		1.00	
Primary	1.15 (0.55, 2.43)		1.15 (0.41, 3.28)	
[1]Secondary	1.22 (0.63, 2.39)		1.25 (0.48, 3.24)	
Tertiary	0.64 (0.3, 1.36)		1.09 (0.34, 3.49)	
Marital status		0.716		0.934
Single	1.00		1.00	
Currently married	1.19 (0.75, 1.9)		1.09 (0.55, 2.17)	
[2]Ever married	1 (0.55, 1.83)		0.95 (0.38, 2.38)	
[3]Average monthly income		0.133		0.933
< Gh₵ 1,000.00	1.00		1.00	
≥ Gh₵ 1,000.00	0.88 (0.34, 2.24)		0.69 (0.97, 4.96)	
[4]Employment status		**0.023**		0.193
Employed	1.00		1.00	
Unemployed	0.53 (0.28, 1.01)		0.56. (0.14, 2.27)	
Pensioner	0.19 (0.04, 0.94)		0.17 (0.02, 1.39)	
Drug adherence		0.515		0.512
Adherent	1.00		1.00	
Non -Adherent	1.15 (0.75, 1.75)		1.21 (0.68, 2.16)	
Anxiety level		**<0.001**		**<0.001**
[5]Normal	1.00		1.00	
[6]Borderline abnormal	0.13 (0.07, 0.23)		0.22 (0.11, 0.44)	
[7]Abnormal	0.04 (0.02, 0.09)		0.14 (0.06, 0.33)	
Depression level		**<0.001**		**<0.001**
[5]Normal	1.00		1.00	
[6]Borderline abnormal	0.15 (0.09, 0.25)		0.25 (0.13, 0.45)	
[7]Abnormal	0.02 (0.01, 0.06)		0.05 (0.02, 0.17)	

uOR: unadjusted odds ratio. aOR: adjusted odds ratio. CI: confidence interval. SD: Standard deviation.[1]secondary: junior and senior high school. [2]Ever married: divorced and widowed.[3]Average monthly income: 30 missing data. [4]Employment status: 1 missing data. [5]Normal: (0-7) no case of anxiety and depression, [6]borderline abnormal: borderline case of anxiety or depression (8-10). [7]Abnormal: a case of anxiety or depression (11-21)

CHAPTER FIVE

5.0 DISCUSSION

5.1 Main Findings

The main objective of this study was to identify the factors that determine health related quality of life among HIV positive patients. Factors focused on were socio- demographic factors (age, sex, marital status, highest educational level, employment status and income), level of adherence to medication and psychological factors (anxiety and depression).

Key observations made and results obtained from the results are as follows.

1. More than half (50%) of the study participants reported good or higher overall quality of life, with higher domain scores in the spiritual religious and personal belief domain and least score in the social relationship domain.
2. Age, highest education level, marital status, drug adherence, anxiety and depression were factors associated with at least one of the WHOQoL- HIV Brefs domains.
3. Anxiety and depression were the only factors that were significantly associated with all WHOQoL-HIV Bref domains and overall quality of life.
4. Drug adherence influenced QoL scores in only the level of independence domain.

5.2 Methodological Validity

This study used simple random sampling in the selection of participants for the survey such that, each member of the study population had equal chance of participating in the survey. This helped to reduce selection bias.

During data collection, the original language of the WHOQoL- HIV Bref was translated into a local dialect. This could bias the data collected from participants (information bias). Mock interviews were done between research assistants repeatedly in six meetings to show consistency in translating the questionnaire especially, into the local dialect. This helped reduce interviewer bias. Data collected in this study was subject to recall bias as tool measures quality of life, adherence, anxiety and depression within the last one week and maximum two weeks for the WHOQoL-HIV Bref. Also, the associations under study were not known to both interviewer and participant; hence this helped to control information bias on the part of the interviewer and participant.

The choice of a cross sectional design, limits the possibility of making inferences on the relationship between determinants under study and health related quality of life to other populations. Furthermore, community acceptance, social support and health facility factors which are also very important factors that influence HRQoL were not discussed in this study and could be considered in further studies.

5.3 Comparison of Current Studies with that of Previous Studies

5.3.1 Health Related Quality of Life (HRQoL) Among PLWHA

Considering the six domains of the WHOQoL-HIV Bref, the study revealed higher quality of life scores in the spiritual, religion and personal belief domain. Similar accounts are reported by a study done by Odili, Ikhurionan, Usifoh and Oparah, (2011) supporting spiritual, religion and personal belief as a strong domain accounting for good HRQoL. Negative religious coping strategies (an insecure relationship with ones' deity) have been found to be associated with lower quality of life in HIV positive patients and vice versa (Lee, Nezu and Nezu, 2014). The domain with the least mean score was the social relationship domain which is measured by satisfaction with personal relationship with family and friends, support from friends, sexual life and the feeling of being accepted by others. Similar findings were made by Tran, (2012) in a Vietnam population and Issahaku, (2017) among PLWHA receiving care at the Tamale Teaching Hospital, recording social relationship domain as a least contributor to quality of life.

Greater proportion of participants reporting good HRQoL contradicts the findings of Fosu, (2016) among HIV positive patients on ART at the Eastern Regional Hospital, Koforidua where majorly poor quality of life with low domain scores were reported. Similar findings are reported by Issahaku, (2017) where majority of participants reported good overall quality of life.

Cure has not been found to the chronic disease HIV/AIDS and hence with the introduction of antiretroviral drugs, PLWHA see life to be much more meaningful, are not bothered so much by people blaming them for their HIV status, do not fear much about the future and do not worry much about death. Much effort is needed by government and non - governmental organizations (NGOs) to ensure the continuous availability of drugs at all times to help improve treatment

outcomes and HRQoL. Least scores in social relationship domain implies that infected persons continue to feel unaccepted by others, do not have much satisfaction with their sex life, receive inadequate support from friends and are not satisfied with their personal relationships.

5.3.2 Factors Determining HRQoL among PLWHA

5.3.2.1 Socio-demographic factors as determinants

Sociodemographic factors that influenced quality of life domain scores were age, highest educational level and marital status.

Age

Age influenced physical, level of independence and social relationship domain scores. For the physical domain, participants who were within more than 57 years age range had much reduced domains scores than those within 38-57 years age group when compared to participants within 18-37 age range. This trend confirms a decrease in physical health with advancing age (Degroote et al., 2014). For the level of independence and social relationship domain scores, 38-57 years age group showed increased domain scores as compared to those with 18-37 years age group.

The findings of this study with regards to age, conformed with findings of Odili et al., (2011b) when age was found to have significant associations with physical, level of independence and social relationship domains. The findings of this study contradicted those of Karkashadze et al., (2017) and Mahalakshmy et al., (2011) where age had significant association with quality of life with younger age experiencing poor quality of life.

Generally, older age is associated with a decrease in physiological function and hence in the face of HIV infection which deteriorates immune function, a decrease in physiologic function is expected.

Highest educational level

Regarding highest educational level, participants with secondary and tertiary education had increased level of independence and social relationship domain scores when compared with participants with no education. These findings conform to that of Issahaku, (2017) with regards participants with secondary and tertiary education reporting higher level of independence and social domain scores compared with participants with no education. Furthermore, Mwesigire, Martin, Seeley, and Katamba, (2015) in their findings concluded that education was important in improving quality of life and income. Therefore with higher education, standard of living improves with an improvement in health seeking behavoiurs, thereby improving quality of life (Kumar, Girish, Nawaz, Balu, and Kumar, 2014)

Marital status

Marital status showed significant association with only the level of independence domain such that participants who were ever married reported higher domain scores, with currently married participants reporting decreased domain scores when compared with participants who were single. Findings of this study does not conform with studies of Issahaku, (2017) where marital status showed significant association with psychological, social relationship and spiritual, religion and personal belief domain and not level of independence domain. Also the findings of this study contradicted that of Bello and Bello, (2013) where married women were found to show better quality of life. Ever married respondents in this study might have better coping strategies

pertaining to performing their daily activities, less dependence on medical treatment, capacity to work and to get around as compared with married respondents.

5.3.2.2 Level of Adherence to Antiretroviral Drugs and HRQoL.

Adherence to medication, specifically to antiretroviral drugs only showed association with the level of independence domain such that non- adherent participants showed higher scores as compared to adherent participants. This was so because even though majority of the participants reported good quality of life, majority of them reported non -adherence as well. Findings of this study conforms with that of Degroote et al.,(2014), where ten (10) out of twelve (12) studies established a strong association between adherence and HRQoL but not regarding non-adherence reporting higher quality of life scores. Results of this study with regards level of adherence did not conform with findings of Briongos Figuero et al., (2011), which established that there was no association between level of adherence and HRQoL. Further studies could employ the use of longitudinal cross sectional studies or cohort study to clarify this association as used by Vikram et al., (2018), to establish a clearer association between level of adherence and HRQoL, where adherent patients reported higher QoL. Further studies could also be conducted to clarify why non- adherent patients would report more level of independence domain scores than adherent patients. Vikram et al., (2018) further to establish that adherence to antiretrovirals continue to remain a problem and hence the need for investigations to improve on adherence to medication among PLWHA.

5.3.2.3 Psychological Factors (Anxiety and Depression) and HRQoL

The findings of this study established very strong associations between psychological factors (anxiety and depression) and all domains as well as overall quality of life. Participants with abnormal levels of anxiety and depression showed much decreased quality of life scores than

borderline abnormal levels when compared with normal cases. This implies that anxiety and depression are strong predictors of HRQoL in the population. A study by Betancur, Lins, Oliveira, and Brites, (2017) concludes that psychological component of health serves as the basics for the management of HIV positive patients and recommends that counselling by psychologist should be initiated before treatment with ARVs begins and periodic assessment of anxiety and depression with appropriate referrals should be initiated. The results of this study concerning anxiety and depression support studies done by Degroote et al., (2014), that normal levels of anxiety improves HRQoL and Figuero et al., (2011) that normal levels of depression are associated with higher HRQoL scores. According to Alemayehu, Wubshet, Mesfin, Tamiru and Gebayehu, (2017), depression should be targeted when instituting strategies to improve on HRQoL.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Social relationship among PLWHA is poor and hence should be given much attention. This can be done with the help of health workers, government and NGOs by designing educative programmes to encourage PLWHA to have more interactions. These educative programmes could also be geared towards improving their sexual life and make them feel more accepted by society. Special attention should be given to the older ages during clinical visit to impact positively on the general wellbeing as older age comes with its own challenges. Anxiety and depression significantly influence HRQoL and hence should be routinely assessed among PLWHA.

6.2 Recommendations

Social relationship among PLWHA can be improved by sensitizing stakeholders including health workers, Ghana AIDS Commission (GAC) Non- Governmental Organizations and government to develop programmes that will ensure adequate social support for PLWHA such that they are able to integrate properly with society.

Assessment of anxiety and depression should be done at every hospital visit, by engaging more of the services of psychologists to help identify these conditions on time for early treatment to improve upon the HRQoL of HIV infected persons who suffer from anxiety and depression.

Even though most participants reported good quality of life proportion of participants who were adherent to medication were less. Fixed dose regimen and one daily dosing of medications could be employed to encourage adherence.

Participants were selected from a single facility; further studies could focus on the selection of participants from various levels of health systems or different facilities. Further studies can also consider studying the association determining between factors such as community acceptance, health facility related factors and social support against HRQoL.

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APPENDICES

Appendix A- Participant Consent Form – HIV Positive Patient

School of Public Health

College of Health Science

University of Ghana

Project Topic

Determinants of Health Related Quality of Life of HIV Positive Patients on Antiretroviral Therapy

Background

Dear Participant,

I wish to invite you to participate in an academic research involving the health related quality of life of HIV positive patients on antiretroviral therapy (ART). My name is Cynthia Emefa Sena, a student of the School of Public Health, University of Ghana. I am undertaking a study on the topic **Determinants of Health Related Quality of Life in HIV Positive Patients on Antiretroviral Therapy.**

The objective of this study is to provide an understanding of factors that determine health related quality of life among HIV positive patients. This will be achieved by measuring the health related quality of life among HIV positive patients, exploring socio-demographic determinants (age, sex, marital status, employment, educational status and income), level of adherence to medication and psychological factors (depression and anxiety) in relation to of HRQoL. This will

help in improving health worker – patient relationship and also serve as a way to evaluate implemented policies. This research will form part of my work for the award of a Masters' degree in Public Health.

Procedures

The study seeks to interview HIV positive patients at Ridge Hospital, using a questionnaire.

Risks and Benefits

The information you provide will help me understand the true reflection of the disease and treatment regimen on your quality of life and also point out issues that need to be tackled to improve your quality of life. This information, I believe, will benefit you in the long run as it will kindle the interest of policy makers to pay more attention to the health related quality of life of HIV positive patients. Your participation in this study will only take 20 minutes of your time. Be assured that the information you will provide will be treated with the uttermost confidentiality and anonymity.

Right to refuse

Participation in this study is voluntary and you can choose not to partake. You are at liberty to withdraw from the study at any time. However, I will encourage your full participation since your participation is important.

Client's Consent

I, the participant, declare that the purpose, procedures as well as risks and benefits of the study have been thoroughly explained to me and I have understood them. I hereby agree to take part in this study.

Signature of participant / thumbprint……

Date……. / …… / ……..

Interviewer's Statement

I, the undersigned, have explained this consent form to the subject in simple language that she/he understands, clarified the purpose of the study, procedures to be followed as well as the risks and benefits involved. The subject has freely agreed to participate in the study.

Signature of interviewer……

Date ……. / …….. / ……

Address

Cynthia Emefa Sena

P O Box 7911

Accra- North

In case of any concern you can contact the Ethics Administrator, Ms Hannah Frimpong, GHS/ERC on: 0243235225 / 0507041223.

Appendix B - Questionnaire

SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF GHANA

DEPARTMENT OF BIOLOGICAL, ENVIRONMENTAL AND OCCUPATIONAL HEALTH

This questionnaire is designed to measure the health related quality of life (HRQoL) among HIV positive patients, explore socio-demographic determinants of HRQoL, determine the association between the level of adherence to antiretroviral drugs and HRQoL and to explore the association between psychological factors (anxiety and depression) and HRQoL.

Please answer the questions as accurately as you can. I need to know what is really happening, not what you think I want to hear.

All answers will be treated confidentially

Kindly tick (√) as appropriate

A. Demographic Details

1. Age at last birthday: **18- 27 [ ] 28-37 [ ] 38 - 47 [ ] 48 – 57 [ ] 58 and above [ ]**

2. Sex: **Male [ ] Female [ ]**

3. Highest Educational Level: **Primary [ ] Secondary [ ] Tertiary [ ] None[ ]**

4. Marital Status: **Single [ ] Married [ ] Divorced [ ] Widowed [ ] Co-habiting [ ]**

5. Average Monthly Income: **<GH₵ 500.00[ ]** **GH₵500.00 – GH₵999.00 [ ]**

GH₵1,000 - GH₵1,499.00 [ ] **GH₵ 1,500 - GH₵1, 999.00 [ ]**

GH₵2,000.00 - above

6. Number of years of diagnosis: **< 1year [ ]** **1-5 years [ ]** **6- 10 years [ ]**

10 years and above [ ]

7. Employment status: **employed [ ]** **unemployed [ ]** **pensioner [ ]**

……

SECTION A- HEALTH RELATED QUALITY OF LIFE ASSESSMENT

The questions in this scale ask your questions to assess your HRQoL using six domains which are physical, psychological, level of independence, social relations, environmental factors and spirituality, religion and personal beliefs. In each case, you will be asked to indicate by circling how often you felt or thought a certain way. Questions refer to last two (2) weeks

---

PHYSICAL DOMAIN

1= Not at all 2= A little 3= A moderate amount 4= Very much 5=An extreme amount

1. How have you felt that physical pain prevents you from doing what you need to do?

	1	**2**	**3**	**4**	**5**

2. Do you have energy for everyday life?	**1**	**2**	**3**	**4**	**5**
3. How satisfied are you with your sleep?	**1**	**2**	**3**	**4**	**5**

4. How much are you bothered by any physical problems related to your HIV infection?

	1	**2**	**3**	**4**	**5**

PSYCHOLOGICAL DOMAIN

1= Not at all 2= A little 3= A moderate amount 4= Very much 5=An extreme amount

5. How much do you enjoy life?	**1**	**2**	**3**	**4**	**5**
6. How well are you able to concentrate?	**1**	**2**	**3**	**4**	**5**

7. How satisfied are you with yourself? **1 2 3 4 5**

8. Are you able to accept your bodily appearance? **1 2 3 4 5**

9. How often do you have negative feelings such as blue mood, despair, anxiety and depression?

1 2 3 4 5

LEVEL OF INDEPENDENCE DOMAIN

1= Not at all 2= A little 3= A moderate amount 4= Very much 5=An extreme amount

10. How well are you able to get around? **1 2 3 4 5**

11. How satisfied are you with your ability to perform your daily living activities?

1 2 3 4 5

12. How much do you need any medical treatment to function in your daily life?

1 2 3 4 5

13. How satisfied are you with your capacity for work? **1 2 3 4 5**

SOCIAL RELATIONSHIP DOMAIN

1= Not at all 2= A little 3= A moderate amount 4= Very much 5=An extreme amount

14. How satisfied are you with your personal relationships?

1 2 3 4 5

15. How satisfied are you with the support you get from your friends?

1 2 3 4 5

16. How satisfied are you with your sex life? **1 2 3 4 5**

17. To what extent do you feel accepted by the people you know?

1 2 3 4 5

ENVIRONMENTAL DOMAIN

1= Not at all 2= A little 3= A moderate amount 4= Very much 5=An extreme amount

18. How safe do you feel in your daily life? **1 2 3 4 5**

19. How satisfied are you with the conditions of your living place?

1 2 3 4 5

20. Have you enough money to meet your needs? **1 2 3 4 5**

21. How satisfied are you with your access to health services?

1 2 3 4 5

22. How available to you is the information that you need in your day-to-day life?

1 2 3 4 5

23. To what extent do you have the opportunity for leisure activities?

1 2 3 4 5

24. How healthy is your physical environment? **1 2 3 4 5**

25. How satisfied are you with your transport? **1 2 3 4 5**

SPIRITUAL, RELIGION AND PERSONAL BELIEFS

1= Not at all 2= A little 3= A moderate amount 4= Very much 5=An extreme amount

26. To what extent do you feel your life to be meaningful?

1 2 3 4 5

27. To what extent are you bothered by people blaming you for your HIV status?

1 2 3 4 5

28. How much do you fear the future? **1 2 3 4 5**

29. How much do you worry about death? **1 2 3 4 5**

GENERAL QUALITY OF LIFE

1. Very poor 2. Poor 3. Neither good nor bad 4. Good 5. Very Good

30. How would you rate your quality of life? **1 2 3 4 5**

1. Very Dissatisfied 2. Dissatisfied 3.Neither Dissatisfied nor satisfied

4. Satisfied 5. Very satisfied

31. How satisfied are you with your health? **1 2 3 4 5**

SECTION B – MEDICATION ADHERENCE ASSESSMENT

The questions in this scale assess medication adherence, you are required to answer yes or no to questions being asked for questions 1-4 and give appropriate answers to question 5 and 6

---

1. Do you ever forget to take the medication? ..... **Yes [ ]** **No [ ]**

2. Do you always take the medication at the specified at the specified time?

……**Yes [ ]** **No [ ]**

3. Do you ever stop taking the medication if you feel ill …….... **Yes [ ]** **No [ ]**

4. Did you forget to take the medication during the weekend? …….**Yes [ ]** **No [ ]**

5. In the last week, how many times did you not take a dose? ..... **A. Greater than 10**

B. 6-10

C. 3-5

D. 1-2

E. None of the above.

6. Since the last medical visit, how many full days did you not take the medication.

Number of days ……

SECTION C- ANXIETY AND DEPRESSION ASSESSMENT

The questions below assess whether a patient either shows anxiety or depression or both as a result of living with HIV. Tick appropriate answers that apply. Immediate answers give a better reflection.

ANXIETY

1. I feel tensed or 'wound up'

A. Most of the time [ ] **B. A lot of the time [ ]**

C. From time to time, occasionally [ ] **D. Not at all [ ]**

2. I get a sort of frightened feeling like 'butterflies' in the stomach:

A. Not at all [ ] **B. Occasionally [ ]** **C. Quite often [ ]** **D. Very often [ ]**

3. I get a sort of frightened feeling as if something awful is about to happen

A. Very definitely and quite badly. **B. Yes but not too badly**

C. A little but it doesn't worry me [ ] **D. Not at all [ ]**

4. I feel restless as I have to be on the move

A. Very much indeed [ ] **B. Quite a lot [ ]** **C. Not very much [ ]**

D. Not at all [ ]

5. Worrying thoughts go through my mind.

A. A great deal of the time [ ] **B. A lot of the time [ ]**

C. From time to time, but not too often [ ] **D. Only occasionally [ ]**

6. I get sudden feelings of panic:

A. Very often indeed [ ] **B. Quite often [ ]** **C. Not very often [ ]**

D. Not at all [ ]

7. I can sit at ease and feel relaxed

A. Definitely [ ] **B. Usually [ ]** **C. Not often** **D. Not at all**

DEPRESSION

1. I feel as if I am slowed down

A. Nearly all the time [ ] **B. Very often [ ]** **C. Sometimes [ ]** **D. Not at all [ ]**

2. I enjoy the things I used to enjoy.

A. Definitely as much [ ] **B. Not quite so much [ ]** **C. Only a little [ ]**

D. Not at all [ ]

3: I have lost interest in my appearance:

A. Definitely [ ] **B. I don't take as much care as I should [ ]**

C. I may not take quite as much care [ ] **D. I take just as much care as ever [ ]**

4. I can laugh and see the funny side of things:

A. As much as I always could [ ] B. Not quite so much now [ ]

C. Definitely not so much now [ ] D. Not at all [ ]

5. I look forward with enjoyment to things:

A. As much as I ever did [ ] B. Rather less than I used to [ ]

C. Definitely less than I used to [ ] D. Hardly at all [ ]

6. I feel cheerful

A. Not at all [ ] B. Not often [ ] C. Sometimes [ ] D. Most of the time [ ]

7. I can enjoy a good book or radio or TV program

A. Often [ ] B. Sometimes [ ] C. Not often [ ] D. Very seldom [ ]

THANK YOU FOR PARTICIPATING

Appendix C: Ethical Approval