COMPARATIVE STUDY OF PERCEIVED HEALTH-RELATED QUALITY OF LIFE AND WELLBEING OF HIV PATIENTS WITH AND WITHOUT TB CO-INFECTION AT UNIVERSITY OF PORT-HARCOURT TEACHING HOSPITAL, PORT-HARCOURT, NIGERIA

A DISSERTATION

SUBMITTED BY

DR KANU NJIDEKA ESTHER

TO

THE WEST AFRICAN COLLEGE OF PHYSICIANS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE FINAL FELLOWSHIP OF THE WEST AFRICAN COLLGE OF PHYSICIANS

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CERTIFICATION

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DR <u>KANU</u> NJIDEKA ESTHER

DEDICATION

I dedicate this work to my mother, Late Mrs Lois Obiageli Chinwuba, without whom I would not be where I am today. To my husband Fredrick, the most understanding and loving spouse on earth. To my son Kamfe, my pride and my greatest source of joy. To all HIV victims worldwide who suffer from the physical and social effects of the disease and whose voices are never heard.

ACKNOWLEDGEMENT

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LIST OF ABBREVIATIONS

AIDS   –   Acquired Immune Deficiency Syndrome

AFB   –   Acid Fast Bacilli

ARV   –   Antiretroviral

CDC   –   Centre for Disease Control

DALYS   –   Disability Adjusted Life Years

DOTS   –   Directly Observed Treatment Short Course

FHI-360   –   Family Health International-360

HAART   –   Highly Active Anti-Retroviral Therapy

HCT   –   HIV Counselling and Testing

HIV   –   Human Immunodeficiency Virus

HIV/TB   –   HIV and TB co-infected

HRQOL   –   Health Related Quality of Life

LGA   –   Local Government Area

MDR-TB   –   Multi Drug Resistant Tuberculosis

MOB   –   Mobility and Self care

NTBLCP   –   National Tuberculosis and Leprosy Control Program

PAC   –   Physical Activity

PEPFAR   –   United States President's Emergency Funds for AIDS Relief

PLWHA   –   People Living with HIV and AIDS

QALY   –   Quality-Adjusted Life Year

QWB   –   Quality of Wellbeing Scale

QOL	–	Quality of Life
SAC	–	Self care and Usual Activity
SF-36	–	Short Form (36 item) Quality of Life assessment
SWEMWBS	–	Short Warwick-Edinburgh Mental Well-being Scale
TB	–	Tuberculosis
UPTH	–	University of Port Harcourt Teaching Hospital
VAS	–	Visual Analogue Scale
WHO	–	World Health Organization
WHO-ICF	–	World Health Organization International Classification of Functioning
WHOQOL	–	World Health Organization Quality of Life
WHOQOL-BREF	–	Brief version (26-item) of World Health Organization Quality of Life Assessment-100 instrument
YHL	–	Year of Health Life

KEY TERMS

Health-related Quality of Life (HRQOL): is a multi-dimensional construct referring to patients' perception of the impact of disease and treatment on their physical, psychological, social function and well-being.

Household monthly income: the collective income in monetary terms of the group of people who live together with the respondent and who cooperate

Social Class

I – Professionals (Accountants, Engineers, Journalist)

II – Other Professionals (Teachers, Secretaries, Nurses)

III – Non-manual skilled workers (Drivers, carpenters, mechanics, caterers, tailor)

IV – Semi-skilled workers and small scale traders

V – Unskilled workers (petty traders, night guards, cleaners, students)

ABSTRACT

Background: Health Related Quality of Life is a multidimensional construct referring to patient's perception of the impact of disease and treatment on their physical, psychological, social function and wellbeing. HIV and Tuberculosis are two diseases of public health importance and there is paucity of data on the quality of life of patients who suffer from these diseases in Nigeria. This study was carried out to measure, compare and identify factors affecting health-related quality of Life of patients with HIV and HIV/TB co-infection in adult patients attending the Anti-Retroviral Clinic of the University of Port-Harcourt Teaching Hospital.

Methodology: This was a comparative cross-sectional study of 144 patients with HIV only and 144 HIV/TB co-infected patients. Every consecutive patient who met the inclusion criteria was recruited over three months. Interviewer administered questionnaires were used to collect data on socio-demographic, socio-economic, medical and lifestyle information from consenting patients. The questionnaires adopted the 26-item WHO Quality of Life instrument – short version (WHOQOL-BREF) and Quality of Wellbeing Self Administered scale (QWB-SA) to measure the HRQOL and wellbeing among study participants.

Results: The mean ages were 35.69 ± 10.28 and 36.03 ± 10.92 among HIV only and HIV/TB co-infected groups respectively (p=0.532). Majority of respondents in both groups were females. Over 45% of respondents in both groups had secondary education with 62.5% of HIV patients and HIV/TB co-infected in the lower social classes IV and V. The score for HRQOL ranged from 61.9 to 78.5 in the HIV only group and 61.6 to 75.8 in the HIV/TB co-infected group. The HIV/TB co-infected patients had lower QOL in the physical (p=0.016) and psychological (p=0.006) and global (p=0.029) domains of QOL. Respondents with higher level of education had a better HRQOL compared to those with lower educational level in the HIV only group

(p=0.04).The proportion of respondents with good QOL increased as household income increased in the HIV group (p=0.0025).Other factors showed no statistically significant association (p>0.05).

Conclusion: HIV/TB co-infected patients had lower quality of life in overall health, and in the physical and psychological domains of QOL when compared to those with HIV only. The two groups did not differ significantly in the social and environmental domains. Educational level and household income were significant factors found to affect quality of life.

Recommendation: The TB control program should design strategies to improve the quality of life of HIV/TB co-infected patients. Physical and psychological health should be targeted for intervention to improve the quality of life of patients with HIV/TB co-infection.

CHAPTER ONE

1.   INTRODUCTION

1.1 Background for the Study

The Human Immunodeficiency Virus (HIV) infection causes a chronic and debilitating disease of global public health concern. Acquired Immune Deficiency Syndrome (AIDS) is the final stage of the infection, which severely damages the immune system. The pandemic of HIV/AIDS has caused millions of deaths worldwide and has crippled the lives of many more. Since the start of the epidemic, about 75 million people have become infected with the virus.[1] In 2012 alone, an estimated 2.3 million people became newly infected with HIV and 1.7 million died from AIDS related causes worldwide.[2]

Sub-Saharan Africa is the most affected region, with nearly 1 in every 20 adults living with HIV, which amounts to an estimated 22million (two thirds of the global total) people living with HIV.[2] Sixty nine per cent of all people living with HIV are living in Sub-Saharan Africa and 70% of new infections occur yearly in this region[3]. Nigeria bears the brunt of this epidemic with an estimated 3.1 million people living with HIV in Nigeria in 2011,[4] the country ranks as one of the countries with the highest burden of HIV infection in the world, next only to India and South Africa.[5] Rivers state with a sero prevalence of 15.2% is the 10th highest prevalence in the country.[6] Almost 28 years after the first case of AIDS was reported in Nigeria, the country still faces severe epidemics.[7] Based on an overall national prevalence of 3.4%,[6] it is estimated that in 2012 alone, 3.6 million Nigerians were living with HIV/AIDS, 2.5 million children were orphaned, and about 1000 new cases of HIV were discovered daily.[7] With this alarming increase of the HIV/AIDS epidemic in the country and the limited accessibility and availability of Highly Active Anti-Retroviral Therapy (HAART), the majority of HIV/AIDS patients continue to suffer

with the disease, with a serious impact on their quality of life.[8] Many HIV patients battle numerous social problems such as stigma and depression, which affect their quality of life, in terms of their physical, mental, and social health.[1,8]

Tuberculosis (TB), a bacterial infection caused by the mycobacterium tuberculosis is second only to HIV/AIDS as the greatest killer worldwide due to a single infectious agent.[9] TB remains the leading cause of death among people living with HIV.[2,9]At least one-third of people living with HIV worldwide are infected with TB bacteria, although not yet ill with active TB.[10] People living with HIV and infected with TB are 30 times more likely to develop active TB disease than people without HIV.[11] HIV and TB therefore form a lethal combination, each speeding the other's progress. Someone who is infected with HIV and TB is much more likely to become sick with active TB.[11] In 2012, there were an estimated 1.1 million new cases of HIV-positive new TB cases, 75% of whom were living in Africa. In the same year, about 320,000 people died of HIV-associated TB and almost 25% of deaths among people with HIV are due to TB.[12] The global TB prevalence was estimated to have reduced between 1990 and 2007 due to improved treatment, however, the incidence of the disease, increased over this period, mainly due to a resurgence of tuberculosis because of the HIV/AIDS epidemic in the African region.[13]

WHO has defined health as a state of complete physical mental and social well-being and not merely the absence of disease or infirmity and has recognized health as a fundamental human right.[14] The term Quality of Life (QOL) has been defined by the World Health Organization Quality of Life (WHOQOL) Group 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.[15] 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. The term Health Related Quality of Life (HRQOL) is a multi-dimensional construct referring to patients' perceptions of the impact of disease and treatment on their physical, psychological, social function and wellbeing. QOL encompasses the concept of HRQOL and other domains such as environment, family, and work. When quality of life is considered in the context of health and disease, it's commonly referred to as health-related quality of life. Quality of life is one of the most important issues facing the world today and is central to the development of social policy.[16] Health Related Quality of Life studies are now on the increase and becoming important worldwide as health planners, managers and policy makers are beginning to understand the importance of patient reported outcomes in the provision of patient–centered health services.[16] HRQOL, apart from being used in informing patient management and policy decisions, is also used in the measurement and valuation of health for cost effectiveness purposes, where quality adjusted life year combines length of life with HRQOL into a single measure, and thus directs the allocation of resources.[17]

According to the Centre for Disease Control (CDC), well-being is a positive outcome that is meaningful for people and for many sectors of society, because it tells us that people perceive that their lives are going well. Good living conditions (e.g., housing, employment) are fundamental to well-being and tracking these conditions is important for public policy.[18] However, many indicators that measure living conditions fail to measure what people think and feel about their lives, such as the quality of their relationships, their positive emotions and resilience, the realization of their potential, or their overall satisfaction with life. Well-being generally includes global judgments of life satisfaction and feelings ranging from depression to joy.[19] It integrates mental health (mind) and physical health (body) resulting in more holistic

approaches to disease prevention and health promotion.[20] It is a valid population outcome measure beyond morbidity, mortality, and economic status that tells us how people perceive their life is going from their own perspective.[21,22] It is meaningful to the public. Advances in psychology, neuroscience, and measurement theory suggest that well-being can be measured with some degree of accuracy. Results from cross-sectional, longitudinal and experimental studies,[19,23] find that well-being is associated with self-perceived health, longevity, healthy behaviors, mental and physical illness, social connectedness, productivity and factors in the physical and social environment.

Well-being is associated with numerous health, job, family, and economically-related benefits. For example, higher levels of well-being are associated with decreased risk of disease, illness, and injury, better immune functioning, speedy recovery, and increased longevity. Individuals with high levels of well-being are more productive at work and are more likely to contribute to their communities. Well-being can provide a common metric that can help policy makers shape and compare the effects of different policies. Measuring and promoting well-being can be useful for multiple stakeholders involved in disease prevention and health promotion. Understanding people's level of well-being and its determinants is crucial to gear public policies towards better achieving society's objectives. As many of the policies that bear most directly on people's lives are local or regional, more fine-grained measures of well-being will help policy-makers to enhance the design and targeting of policies. They can also empower citizens to demand placed-based policy actions that respond to their specific expectations and, in turn, to restore people's trust.[24]

1.2 Problem Statement

Chronic diseases often have a relapsing and remitting course with substantial impact on function and quality of life. For chronic illnesses without cure, such as in HIV/AIDS, it is important to establish that therapy really makes people feel better. Thus, survival alone is no longer perceived to be the only end point, but efforts are geared towards improving, restoring or preserving QOL.

The effect of HIV/AIDS on an individual goes beyond the physical symptoms and signs. It is a disease that is highly associated with stigma and discrimination and is known to also affect the psychological, social, spiritual life as well as other aspects of the patients' life. It thus impairs the Quality of Life. HIV/AIDS like Tuberculosis is known to affect adults in their productive and reproductive years.[1] It has been identified that HIV and TB, have a negative impact on the mental, social, sexual and economic life of patients,[25] while having a positive impact on their spirituality.[26] HIV and HIV/TB co-infection are associated with stigma, resulting in patients being rejected by their families, their communities, at their places of work and are seen as unfit for work. In addition, health workers' attitude could lead to mental stress and reduction in QOL.[16]

One of the aims of HIV/AIDS therapy is to improve the wellbeing and quality of life of affected people. The introduction of highly active antiretroviral therapy (HAART) has led to a marked reduction in AIDS-related morbidity and mortality.[27] However, although the patients live longer, they often suffer from intense social stigma which forces them to change jobs or places of living, putting further stress on the already weak economic situation.[28] They experience discrimination and/or misunderstanding, tend to become isolated and lose social support from persons significant to them.[29] This often compromises the wellbeing and quality of life (QOL) of such individuals.

The HRQOL of patients with HIV/AIDS and tuberculosis which have been studied in developed countries and in Nigeria[30] show that poorer HRQOL in Nigerian subjects with HIV is associated with depression, low socio-economic status, lower educational background and poor social support[30]. Some studies have also found that HIV/TB co-infected patients have a lower quality of life in all domains as compared to HIV infected patients without active TB.

Studies on QOL in individuals with HIV/AIDS have shown that sex,[31-33] educational and marital status,[34,35] CD4 counts,[31,36-38] age group[36] and the status of employment status[28] have a significant impact on their QOL.

1.3 Justification
With the appreciable rise in longevity of PLWHA, it is important to improve the QOL and well-being of people living with HIV and AIDS and those living with HIV/AIDS and TB.[39] To improve QOL, it is crucial to measure it, and identify its determinants. HIV and AIDS have such serious repercussions on psychic, social and physical well-being, that the assessment of HRQOL of people living with HIV and AIDS helps to gauge how these people are integrated in society after the initial health crisis they face on diagnosis of this disease, thus enabling them to meet their daily responsibilities. It therefore, becomes imperative to understand the status of health-related quality of life of people living with HIV/AIDS and to understand the various factors that determine it. To improve adherence and treatment outcomes, it is important to identify and address factors affecting the quality of life of adults with HIV and/or TB.

Information on the comparison of the two groups will help in deciding and planning how the two groups can be managed in order to meet their specific needs. It is also important in the measurement of the effect of the intervention already on the ground. Identification of these

factors will also allow appropriate intervention measures that will help to meet other identified needs of PLWHA and improve the quality of life of Nigerians living with HIV and AIDS.

It has been seen that apart from physical symptoms, TB patients face various problems that are social and economic in nature.[40] In recent years, increasing efforts have been dedicated to assessing the health-related quality of life experienced by people infected with tuberculosis.

There are limited studies conducted in Nigeria on how PLWHA perceive their life, and paucity of literature on the impact of HIV/TB co-infection on HRQOL of our patients. This brought about the interest and need for this study which aims to measure and compare the HRQOL of adult patients with HIV/AIDS only and HIV/TB co-infected patients. Because of the limited evidence to date, further research is needed to evaluate, how tuberculosis co-infection impacts the quality of life of PLWHA.

Assessing the HRQOL among HIV patients and HIV/TB co-infected patients will attempt to measure and compare aspects of health that affect both groups. It is hoped that findings from this study will provide information in the management of these two groups for better adherence and outcomes, and contribute to health systems strengthening by having patient centered health services.

1.4 Research Questions

1. What is the Health-related Quality of life of adult patients with HIV/AIDS attending Anti-Retroviral Clinic in UPTH

2. What is the Health-related Quality of life of adult patients with HIV/TB attending Anti-Retroviral Clinic in UPTH

3. Is there any difference between Health Related Quality Of Life of adult patients with HIV/AIDS and that of patients with HIV/TB co-infection attending the ARV clinic of UPTH

4. What factors affect the Health Related Quality of Life and well-being among adult patients with HIV/AIDS and those with HIV/TB co-infection in ARV clinic in UPTH

5. What is the level of wellbeing in HIV patients and HIV/TB co-infected patients attending the ARV clinic of UPTH.

1.5 General and Specific Objectives

1.5.1 General Objective:

To measure and compare Health Related Quality of Life of adult patients with HIV/AIDS and those with HIV/AIDS and tuberculosis co-infection attending ARV clinic of University of Port-Harcourt Teaching Hospital.

1.5.2 Specific Objectives:

1. To measure Health-Related Quality of Life among adult patients with HIV/AIDS attending Anti-Retroviral Clinic in UPTH.

2. To measure Health-Related Quality of Life among adult HIV patients co-infected with TB attending ARV clinic in UPTH.

3. To compare the Health-Related Quality Of Life of adult patients with HIV/AIDS with those with HIV/TB co-infection attending the ARV clinic of UPTH.

4. To determine factors that affects the Health-Related Quality of Life among adult patients with HIV/AIDS and those with HIV/TB co-infection in ARV clinic in UPTH.

5. To measure wellbeing in HIV patients and HIV/TB co-infected patients attending the ARV clinic of UPTH.

CHAPTER TWO

2.   **LITERATURE REVIEW**

2.1 Epidemiology of HIV/AIDS

HIV infects the cells of the immune system and destroys or impairs their function resulting in the body being unable to fight off infections and diseases. AIDS is the most advanced stage of HIV infection defined by the occurrence of any of more than 20 opportunistic infection such as tuberculosis or related cancers. HIV is transmitted through unprotected sexual intercourse (vaginal or anal) or oral sex with an infected person; transfusion of contaminated blood; the sharing of contaminated needles and other sharp instruments and from mother to baby during childbirth and breast feeding.[41]

HIV/AIDS is one of the world's most significant public health challenges with 34million people living with the virus , and an estimated 2 million deaths yearly.[2,42] Since 1981 when the first case of HIV/AIDS was discovered and first described , to date, more than 27 million deaths have been attributed to HIV/AIDS. This has placed HIV/AIDS as the world's leading cause of death from an infectious disease.[42] In Nigeria, according to the 2010 HIV National Sentinel Survey, the HIV sero-prevalence rate is estimated to be 4.6% with about 2.98 million (9%of the global total) people living with HIV.[43]

WHO has classified HIV infection into four clinical Stages based on the patient's clinical presentations at the time of initial consultation with the healthcare provider; Clinical stage I are asymptomatic, II-Mild Symptoms- minor mucocutaneous manifestation, weight loss less than 10% of body weight etc, III-Advanced Symptoms-Pulmonary tuberculosis, Weight loss > 10% of body weight, Unexplained chronic diarrhoea > 1 month, Unexplained persistent fever etc, IV-Severe symptoms- HIV wasting syndrome, Pneumocystis Jiroveci pneumonia, Kaposi's sarcoma

and other opportunistic diseases.[44] Laboratory diagnosis is based either on detection of the antibodies in the plasma or serum or demonstration of the virus in the plasma. Generally, any HIV infected person can be detected by laboratory tests within 6 months of infection. Patients who test positive and meet the criteria for the initiation of Anti-Retroviral Treatment (ARV) can be offered. Four different classes of ARV available for HIV treatment in Nigeria are Non-nucleoside reverse transcriptase inhibitors (NNRTIs) such as nevirapine and efavirens; Nucleoside reverse transcriptase inhibitors (NRTIs) such as zidovudine, lamivudine and stavudine; Nucleotide analogue (NtRTIs) such as tenofivir and protease inhibitors (PIs).[44]

2.2 Epidemiology of Tuberculosis

Tuberculosis is an air-borne, infectious disease caused by the bacillus Mycobacterium tuberculosis. It is both preventable and curable, yet remains one of the world's major causes of illness and death with 9.4 million estimated new cases and 1.5 million deaths (including deaths from TB among HIV patients). About one third of those affected, are from the African region.[10] Despite the availability of highly efficacious treatment for decades, TB remains a major global health problem. In 1993, the WHO declared TB a global emergency and this was followed by the introduction of DOTS strategy to control the infection in developing countries. Prevalence and mortality estimates in Nigeria are 6.3-12.9 million and 0.3-1.8 million respectively, with an at risk population of over 140 million. Nigeria is one of the 22 TB high burden countries and ranks 10th in incident cases.[10]

The clinical features of TB include cough, of at least three weeks which may be productive or blood stained, chest pain, weight loss and night sweats. The gold standard for diagnosis is viewing the acid fast bacilli under microscopy and the NTBLCP recommends 2 positive sputum

samples taken at least 48 hours apart.[45] In addition, physicians may make diagnosis based on clinical and radiological findings.

In Nigeria, some of the challenges facing TB control are HIV, Drug resistance and delay in seeking treatment. Due to a combination of economic decline, breakdown of health systems, insufficient application of TB control measures, the spread of HIV/AIDS and the emergence of multi-drug resistant TB (MDR-TB), TB is not declining in many developing countries.[10,46]

2.3 HIV/AIDS and Tuberculosis Co-infection
The HIV virus suppresses the body's immune system, promoting recently acquired or latent infection to disease. TB is the most common opportunistic infection in people living with HIV/AIDS, and accelerates the course of HIV infection, increasing the viral load. It is assumed to be the main cause of death in PLWHA[9] and HIV is the main challenge for TB control targets in Nigeria.[45,47] Worldwide, 14.8% of TB patients have HIV co-infection, and as many as 50-80% of TB patients have HIV co-infection in parts of sub-Saharan Africa.

Worldwide, the main cause of TB resurgence is HIV infection and HIV is the major risk factor for persons infected with the TB bacilli to develop TB disease. Majority of people living with HIV and TB reside in Sub-Saharan Africa, the region which bears the brunt of HIV fuelled TB epidemic. Nigeria has a high degree of overlap between HIV and TB infection among 15-49 years age group.[45] In line with this, the NTBLCP came up with a strategic frame work to integrate HIV and TB control programs. Based on this, all HIV patients are screened for symptoms of TB, and where necessary referred for evaluation and laboratory tests to determine the presence or absence of active TB.

Prevalence of TB co-infection among HIV sero-positive patients attending a Teaching Hospital in Nigeria found the highest prevalence of TB in PLWHA was within the ages 41-50 years.[48] It was reported in the same study that HIV/TB co-infection was significantly associated with being married (OR 2.1; 95% CI, 1.28-3.59; p=0.04), the WHO clinical staging at presentation (or 4.81;CI, 1.42-8.35;p=0.001). Another study in Northern Nigeria to determine the sero-prevalence of HIV infection among TB patients reported that prevalence of co-infection was significantly higher among the females (44.82%) than the males (38.30%) patients and highest among those aged 21-40 years old (45.30%).[49]

2.4 Overview of Quality of Life
There is no single, universally accepted definition of QOL. Though people are typically able to assess their level of quality of life inherently, the manner of determining what components of the construct are included and how to assign them value can be more difficult to articulate. 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.[50] 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.

Quality of life is a concept that is amorphous and confounding. There is much debate regarding what life situations constitute a higher quality of life than others. To define quality of life, it is helpful to consider the definitions of each term. Quality can be considered a distinguishing characteristic, level or variation in grade. Life refers to the characteristics of a person's existence, both in an environmental sense, a physical sense and a sense of mental and spiritual life. One's life is comprised of components such as events and circumstances of that existence.[51] There has

historically been little agreement among researchers as to a working definition of quality of life. Some argue that this construct should be purely objective, the measure of which is described as that which can result from basic properties of the human-environmental interaction such as safety, health, and shelter. This is also referred to as the socioeconomic or demographic component. It is the more easily measured, and less personally perceived than the subjective. This approach is however, troubling to most researchers, who contend that the construct is multidimensional and contains both objective and subjective aspects. Other researchers however contend that QOL is purely subjective, and is interchangeable with one's sense of well-being and happiness. By this way of thinking, perceptions are all that matter. According to a recent review [52] most researchers believe that both subjective and objective information is necessary to the construct. However, in order for measures of quality of life to have meaning, they must accurately represent the individual's point of view. The World Health Organization definition, for example, focuses on the subjective perspective.[53] The subjective aspect of quality of life lies in the perceived satisfaction of the individual with regard to his or her life. It can be considered to have both domain specific as well as general life aspects. This point is worth reiterating in that the critical factor of the subjective aspect is that it is concerned solely with the individuals' interpretation or point of view. A person's perceptions are impacted by his or her relationships, age, sex, geographic location, and developmental stage in life.[54,55] Therefore, quality of life cannot be considered a one size fits all construct.

Quality of life (QOL) assessment has many apparent merits in the measurement of outcome in chronic illness. It can be used to measure incremental improvements rather than complete cure; it takes account of a wide range of aspects of daily living; it places the consumer at the center of the picture; and it can be used across various disciplines of medicine. Quality of life is a popular

term that conveys an overall sense of well-being, including aspects of happiness and satisfaction with life as a whole. It is a broad, multidimensional concept that usually includes subjective evaluations of both positive and negative aspects of life.[53] It is however challenging to measure because, individuals and groups can define it differently. Health is only one of the important domains of overall quality of life. There are other domains as well- such as, jobs, housing, schools, and the neighborhood. Aspects of culture, values, and spirituality are also key aspects of overall quality of life that add to the complexity of its measurement. Nevertheless, researchers have developed useful techniques that have helped to conceptualize and measure these multiple domains and how they relate to each other.

2.5 Concept of Health-Related Quality of Life
Health-related quality of life (HRQOL) is a concept used to describe a comprehensive picture of how a person's health affects their overall well-being. It is a multi-dimensional concept encompassing the core dimensions of general satisfaction and feeling of well-being, physiological state/symptoms of illness, neuropsychological functioning, interpersonal relationships, performance of social skills and economic status. The Centre for Disease Control have described it to encompass those aspects of overall quality of life that can be clearly shown to affect health—either physical or mental.[56] The American Thoracic Society defined HRQOL as an individual's satisfaction or happiness with domains of life insofar as they affect or are affected by health. HRQOL can be distinguished from quality of life in that it concerns itself primarily with those factors that fall under the purview of health care providers and health care systems.[57]

It includes domains related to physical, mental, emotional, and social functioning. It goes beyond direct measures of population health, life expectancy, and causes of death, and focuses on the impact, the health status has on the quality of life.[58] On the individual level, this includes

physical and mental health perceptions and their correlates-including health risks and conditions, functional status, social support, and socioeconomic status.[53,56] HRQOL is rapidly gaining acceptance as a measurable outcome. Assessment of HRQOL is important in medical practice to improve the doctor-patient relationship, in assessing the effectiveness and relative merits of different treatments, in health service evaluation, in research and in policy making.[59] It is especially relevant to conditions that are chronic and impairing such as HIV/AIDS, Tuberculosis, Hypertension, Diabetes, Heart diseases, Asthma and Sickle cell disease. Questions about perceived physical and mental health and function have become an important component of health surveillance and are generally considered valid indicators of service needs and intervention outcomes. Self-assessed health status has also provided a more powerful predictor of mortality and morbidity than many objective measures of health.[60] HRQOL measures therefore make it possible to demonstrate scientifically the impact of quality of life on health, going well beyond the old paradigm that was limited to what can be seen under a microscope.

2.6 Conceptual Models of Health-related Quality of Life

In the health-related quality of life conceptual model, outcomes are key to understanding the effectiveness of patient care. By incorporating patient outcomes such as HRQOL into practice, researchers, administrators, and clinicians can determine optimal strategies for patient care and this outcome model could be used for describing, explaining, and predicting quality patient care.[61] There are different models of HRQOL. The most frequently used models are: Wilson and Cleary, Ferrans and colleagues and WHO models.

Wilson and Cleary's model of HRQOL[62] combines two paradigms, biomedical and social science. This model is a taxonomy that includes five major well-defined domains: biological and physiological factors, symptoms, functioning, general health perceptions, and overall quality of

life. However, the definitions for two other domains, individual and environmental characteristics, were not made explicit. In addition to classifying these outcome measures, the model proposes specific causal relationships between them that link traditional clinical variables to measures of HRQOL. As one moves from left to right in the model, one moves outward from the cell to the individual to the interaction of the individual as a member of society. Each domain is related to the others, and reciprocal relationships may exist. The authors suggest that environmental and individual factors are associated with outcomes, thus affecting total HRQOL. The concepts at each level are increasingly integrated and increasingly difficult to define and measure. At each level, there are an increasing number of inputs that cannot be controlled by clinicians or the health care system as it is traditionally defined.

The Ferrans conceptual model of quality of life [63,64] was developed based on the adoption of an individualistic ideology, which recognizes that quality of life depends on the unique experience of life for each person. Individuals are the only proper judge of their quality of life, because people differ in what they value. Consistent with this ideology, quality of life was defined in terms of satisfaction with the aspects of life that are important to the individual. The model was developed using qualitative methodology. Factor analysis of patient data was used to cluster related elements into domains of quality of life. The resulting model identifies four domains of quality of life: health and functioning, psychological/spiritual, social and economic, and family. Subsequent cross-cultural work with African Americans and Mexican Americans has provided evidence that the elements of the model appropriately reflect quality of life for segments of the population not sampled in the original work. The Ferrans and Powers Quality of Life Index was developed based on this model.

The WHO has conceptualized HRQOL as an individual's perception of his or her health and health-related domains of well-being.[65] Health and health-related domains have been further conceptualized in terms of functioning within the World Health Organization International Classification of Functioning, disability, and Health (WHO ICF) model. This model includes components within two main parts. The first part focuses on functioning and disability (body functioning and structures, activities, and participation), whereas the second part addresses contextual factors (environmental and personal). The main concepts are well-defined overall, with explicit propositions and assumptions. However, unlike the models by Wilson and Cleary[62] and Ferrans and colleagues,[64] the WHO ICF is not specific to HRQOL. Cieza and Stuki [66] assert that the WHO ICF categories under functioning can serve as the basis for the operationalization of HRQOL but are not the only potential application of the WHO-ICF. For example, Miller and colleagues[67] used the WHO-ICF as a framework to organize a comprehensive overview of nursing and interdisciplinary care of the stroke patient. The WHO-ICF serves more as a mapping and classification framework than as a guide for hypothesis generation in the area of HRQOL.

2.7 Differences between HRQOL, QALYs, DALYs and YHL
A Quality-Adjusted Life Year (QALY) is defined as the equivalent of a completely well year of life, or a year of life free of any symptoms, problems, or health-related disabilities. While HRQOL measures general satisfaction and feeling of well-being, physiological state/symptoms of illness, neuropsychological functioning, interpersonal, performance of social skills, economic and employment status, QALYs are estimates of person-years lived at particular levels of health. It is mostly used in cost-effectiveness analysis that involves health conditions that consider the quality as well as the length of life. In QALYs, quality is typically measured on a scale of zero (death) to 1(perfect health) by assigning various weights to potential health states. While HRQOL is a concept used to describe a comprehensive picture of how a person's health affects

their overall well-being, QALYs integrate HRQOL with the duration of life to provide a single comprehensive expression of health outcome.

Disability Adjusted Life Years (DALYS) is a measure of overall disease burden, expressed as the sum of potential life lost due to prematurity, mortality and the years of productive life lost due to disability.[68] It extends the concept of potential years of life lost due to premature death to include equivalent years of 'healthy' life lost by virtue of being in states of poor health or disability. In so doing, mortality and morbidity are combined into a single, common metric. One DALY can be thought of as one lost year of "healthy" life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability.[69] DALYs for a disease or health condition are calculated as the sum of the Years of Life Lost (YLL) due to premature mortality in the population and the Years Lost due to Disability (YLD) for people living with the health condition or its consequences. Year of Health Life (YHL) or disability-free life expectancy indicates the number of years a person of a certain age can expect to live without disability.[70] DALY and YHL are related measures which adjust life expectancy estimates with weighted estimates of health and function. On a population level, DALYs and YHL are most useful for guiding health policy and for modelling what we know about death, disease, and their burden especially at the national and multi-national level.[58]

2.8 Measurement of Health-related Quality of Life
Health-related quality of life has been studied extensively, resulting in a variety of application-specific instruments. Among them are the Medical Outcomes Study Short Forms (SF-12 and SF-36), the Sickness Impact Profile, The European Quality of Life five dimensions (Euroqol-5D)

questionnaire, the Quality of Well-Being Scale and the WHO QOL-100.[56,58] While these measures have been widely used and extensively validated in clinical settings and special population studies, their length often makes them impractical to use in population surveillance. Most QOL measurements use questionnaire and the Likert scales to measure the graded responses. These measurements undergo lots of testing for validity and reliability before being released for use. General measures of health status attempt to capture aspects of health that is important to all patients. They are useful for health status comparisons both among patients with the same condition and between patients with different conditions.[71]

The SF-36 was developed from the Medical Outcome Study General Health Survey Instrument. The objective was to develop a general health survey that is comprehensive and psychologically sound, and yet short enough to be used in large scale studies.[72] It consists of 36 items which are aggregated into 8 dimensions of health, which are physical functioning (PF), role-physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role-emotional (RE), and mental health (MH). For each dimension, item scores are coded, summarized and transformed unto a scale from 0 (worst health) to 100 (best health). It yields an 8-scale profile of functional health and well-being scores as well as psychometrically-based physical and mental health summary measures and a preference-based health utility index. The SF-36 can be either self-administered or administered by a trained interviewer, either in person or by telephone. Over the years, the SF-36 has been used in surveys of general and specific populations, for comparing the relative burden of diseases across different sub-groups and in differentiating the health benefits produced by health care treatments. It is however not designed to generate a single index and cannot be used to produce QALYs.[72]

The European Quality of Life-5 Dimension Questionnaire (EQ-5D)[73] is a simple self-administered instrument that assesses HRQOL. It assesses functions in five socially relevant domain; mobility, self-care, Pain-discomfort, Usual activities, anxiety-depression. The conceptual basis of EQ-5D is the holistic view of health which includes the medical definition as well as the fundamental importance of independent physical, emotional and social functioning. The concept of health in EQ-5D encompasses both positive aspect (wellbeing) and negative aspect (illness).The questionnaire is short, easy to administer, capable of use in postal surveys and sufficiently short for use as an addition to other measures. It has been used successfully in several different settings such as scientific trials, health policies, pharmacoeconomics and clinics. It consists of a questionnaire and a Visual Analogue Scale (VAS). The EQ consists of a descriptive system of six dimensions each subdivided into 2 or 3 categories. Taken together, these define a total of 216 possible health states. The EQ can be used to generate a score for HRQOL from 0 to 1, where 0 is dead and 1 is healthy.[72]

The VAS is part of the European quality of life measures which has five dimensions. It is one of the commonly used measures of HRQOL and is used by respondents rating their own health.[74] It has been used in various studies to cross validate HRQOL measures. The VAS records patient's perception of their current overall health and can be used to monitor changes with time. The self-assessment questionnaire is a self-reported description of the subject's current health in 5 dimensions; mobility, self-care, usual activities, pain/discomfort and anxiety/depression. The subject is asked to grade their current level of function in each dimension into one of three degrees of disability (severe, moderate or none). The VAS directly yields a score between 0 and 100 which reflects a respondent's personal view of their own health status. The combinations of these with conditions "death" and unconscious enables description of 245 different health states.

Each health state can be ranked and transformed into a single score called the utility. The utility score is an expression of Quality Adjusted Life Years (QALY) and is commonly used to make evidence-based decisions in analysis of cost-effectiveness. Therefore the EQ-5D can be used for health outcome study and economic analysis.[74,75]

Patient Reported Outcomes Measurement Information System (PROMIS) provides access to both adult and child patient–reported measures of symptoms, such as pain and fatigue, and aspects of health–related quality of life. Each domain measure has undergone rigorous qualitative and psychometric evaluation and refinement through studies with patients with the goal to enable clinicians and researchers to have access to efficient, precise, valid, and responsive indicators of a person's health status. These measures are available for use across a wide variety of chronic diseases and conditions and in the general population.[76] PROMIS measures can be used to compare the health outcomes of patients treated under different healthcare delivery systems or providers.

The World Health Organization Quality of Life (WHOQOL) scale instruments were developed collaboratively in a number of centres worldwide, and have been widely field-tested. The aim was to develop an international cross-culturally comparable QOL assessment instrument. The 100-item QOL assessment instrument, the WHOQOL-100[53] assesses the individual's perceptions of life in the context of their culture and value systems, and their personal goals, expectations, standards and concerns. A 26-item version, the World Health Organization Quality of Life scale-Brief version (WHOQOL-BREF) was derived from there and the instrument deals with subjective as distinct from objective QOL.[53,77,78]

The WHOQOL-BREF[79] has been used in medical practice, research, audit, policy making and in assessing the effectiveness and relative merits of different treatments. It has also been used to assess variations in QOL across different cultures, to compare subgroups within the same culture and to measure change across time in response to change in life circumstances.[77,78] This instrument has been validated and has been developed in a wide range of languages in different cultural settings and yields comparable scores across cultures.[80] There are two models of the WHOQOL-BREF. The initial model was developed in line with the WHOQOL-100 to have six domains-physical health, psychological health, level of independence, social relationships, environment and spiritual. In the second model (4-domains), the domain of level of independence was merged with that of physical health, while the spiritual was merged with the psychological domain.[50] The WHOQOL-BREF has been chosen for this study because it is a generic instrument, and in contrast to disease- or condition-specific instruments which are designed to reflect unique problems most relevant to a given disease, generic QOL tools were developed for use with patients across varying disease types, severities of illness, and cultural subgroups .The WHOQOL-BREF covers important aspects of health and can be used to assess and compare HRQOL across different health conditions and sub-populations and has been shown to have cross-cultural validity.[81]

2.9 Concept of Well-being

Well-being can be understood as how people feel and how they function, both on a personal and social level, and how they evaluate their lives as a whole.[82] The term well-being is sometimes used interchangeably with quality of life. Some researchers report that well-being is more accurately defined as the subjective aspect of the construct, and refers to one's happiness. Subjective wellbeing involves a multidimensional evaluation of life, including cognitive judgments of life satisfaction and affective evaluations of emotions and moods. However it is

worth pointing out that well-being is not exactly the same as happiness. Happiness often refers to how people are feeling moment-to-moment and does not always tell us about how they evaluate their lives as a whole, or about how they function in the world. Well-being is a much broader concept than moment-to-moment happiness: it includes happiness as well as other things such as how satisfied people are with their lives as a whole, and things such as autonomy (having a sense of control over your life), and purpose (having a sense of purpose in life). Subjective well-being at a global level could be operationalized by an individual's self-rating of his or her overall happiness. Domain specific well-being is far narrower. It would be operationalized in terms of one's rating of satisfaction with specific areas. Examples could include a person's happiness with work, living situation, relationships, quality of health care, and community connectedness.

Ryff et al articulated that well-being is actually comprised of several dimensions. These are: self-acceptance, autonomy, positive relationships, environmental mastery, personal growth, and sense of purpose. This line of thinking expands well-being from a more general sense of satisfaction to a construct that includes environmental components as well. Well-being, like quality of life, is multidimensional and is most reliable when several items are used as scales rather than attempting to assess it as a simple, global item of satisfaction or happiness. Well-being refers to how people are in themselves – their emotions, judgments and experiences. The potential drivers of well-being refers on the one hand to external things such as income, housing, education and social networks, and to certain internal things such as health, optimism and self-esteem, all of which influence how people feel and function.

2.10 Measurement of Well-being

Measuring well-being can be done in a number of ways. In general, well-being measures can be classified into two broad categories: objective and subjective measures. Objective measures, assess wellbeing through certain observable facts such as economic, social and environmental statistics. People's wellbeing is assessed indirectly using cardinal measures. On the other hand, subjective measures of wellbeing capture people's feelings or real experience in a direct way, assessing wellbeing through ordinal measures.[83] There is now widespread acknowledgement that measuring subjective well-being is an essential part of measuring quality of life alongside other social and economic dimensions.[84] Well-being measurement tends to be based on individuals, rather than groups, as the unit of measurement, even if we are ultimately interested in the well-being of a particular group of people. Subjective, rather than objective indicators provide the data, and these indicators refer to questions which ask about feelings, experiences and judgments about life.[82] Scales for measurement of well-being include:

The Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS); which is a scale of seven positively worded items, with five response categories, which have been specifically designed to measure both the feeling and functioning aspects of positive mental well-being, i.e. flourishing. It is therefore the recommended scale for measuring flourishing overall. These questions meet various statistical tests of robustness, and they also have face validity as measures of aspects of flourishing within the dynamic model. For example, good feelings ('feeling relaxed'), sense of meaning ('feeling useful') and good relationships (feeling close to other people) measure well-being directly. The SWEMWBS is a shortened version of the longer Warwick and Edinburgh Mental Well-being Scale (WEMWBS), which was developed by Warwick and Edinburgh Universities in 2006, and has been academically validated as having good psychometric properties, good validity and reliability with the ability to distinguish between population groups.

It has been widely used in population surveys in the UK and elsewhere.

The Office for National Statistics (ONS) subjective well-being questions are a set of 4 questions with a response scale of 0-10, intended to capture what people think about their well-being. These questions have been included in the Integrated Household Survey, which is a composite survey that gathers information from over 200,000 people in UK.

Social trust question: The UK National Accounts of Well-being framework, recommends that social well-being be included as a headline measure of well-being given its importance – within functioning – to overall well-being. The Social trust question is a single survey question which measures social trust and is very widely used, often within social capital research, and therefore enables well-being analysis to be linked to this further rich research area.[82]

The Quality of Wellbeing Scale (QWB): was developed in the 1970s as a comprehensive measure of health-related quality of life.[85] The original interview driven QWB is relatively long and complex because it has some branching and probe questions, more expensive and difficult to administer than competing measures and requires a trained interviewer. A self-administered QWB; referred to as the Quality of Well-Being scale, Self-Administered (QWB-SA) was therefore developed to addresses some of these issues. There are several improvements from the original QWB seen in the QWB-SA.

First, several items assessing mental health are now included. Second, the assessment of symptoms follows a clinically useful review of systems model, rather than clustering symptoms based on preference weights. Third, additional symptoms not included in the interview format of the QWB are in the symptom assessment portion of the QWB-SA. Finally, the administration of the questionnaire no longer requires a trained interviewer and can be completed in less time. The

QWB asked patients about symptoms and function over the past 6 days prior to the day of administration, whereas the QWB-SA questions refer to the 3 days prior to the day of administration. This change was designed to reduce respondents' recall bias without decreasing the instrument's ability to assess over a period of time. In addition, assessing 3 days rather than 6 days results in a more rapid administration. The impact on the overall quality of life score of using only the last 3 days was examined by dropping information from Day 4, 5, 6 and recalculating QWB scores based only on the past 3 days. No significant differences in scores were found.[85] The symptom checklist of the QWB-SA was expanded to 58 symptom complexes including at least 12 symptoms that are typically considered psychological. Most items focus on one problem related to one body system. The QWB-SA includes assessment of symptoms in addition to various areas of functioning. The scoring of the instrument utilizes population-derived preference weights. Use of the QWB-SA is growing rapidly. Current studies are addressing the ability of the QWB-SA to detect changes in samples of migraines, cataract surgery patients, mental health populations, arthritis patients, as well as validating the sensitivity of this measure translated in Spanish, German, Italian, Swedish, French-Canadian, and Dutch.

2.11 Health Related Quality of Life among HIV patients
The HRQOL of several diseases and conditions such as HIV/AIDS, tuberculosis, hypertension, diabetes, epilepsy, lymphatic filariasis and schizophrenia have been studied widely in developed countries and a few studies carried out in developing countries like Nigeria using generic or specific quality of Life instruments.[30,86-88] Poorer HRQOL in Nigerian subjects with HIV has been found to be associated with depression, low socio-economic status, lower educational background and poor social support.[30] In a Nigerian study to assess clinical depression and quality of life in a group of HIV seropositive subjects revealed that lower educational level correlated with poorer QOL in all the domains of WHOQOL-BREF except the social

relationship domain. Also, poor social support correlated with poorer QOL scores on domains of physical health and social relationship and presence of medical problems was significantly associated with poorer scores on domains of physical health and psychological health. Depression was significantly correlated with poorer QOL in all domains except the social relationship domain.[30] In another study which assessed the QOL of PLWHA attending the antiretroviral clinics, in University College Hospital Ibadan, Nigeria, 150 HIV-positive patients were randomly selected, and administered questionnaire on socio-demographic data. QOL was assessed with WHOQOL-Bref. The mean QOL scores in three domains were similar: psychological health, 71.60 ± 18.40; physical health, 71.60 ± 13.90; and the environmental domain, 70.10 ± 12.00; with the lowest score in the social domain, 68.89 ± 16.70. Asymptomatic HIV-positive patients had significantly better mean QOL scores than symptomatic patients in the physical (74.04 ± 16.85 versus 64.47 ± 20.94, $p = 0.005$) and psychological domains (76.09 ± 12.93 versus 69.74 ± 15.79, $p = 0.015$). There was no significant difference in the mean QOL scores of men compared to those of women, in all domains assessed.[39] Similar findings were obtained in a descriptive cross-sectional study of 252 PLWHA attending ARV clinics in five health care centres located across the three zones of Kogi State in Nigeria who were consecutively selected to assess the QOL of PLWHA.[89] An interviewer-administered questionnaire, was used to collect socio-demographic and medical data, and the WHOQOL-HIV BREF was used to assess each participant. The overall QOL mean scores in the three domains were similar: psychological health, 15.0 ± 2.8; physical health, 15.2 ± 2.5; and spirituality/religion/personal beliefs, 15.7 ± 3.4. Lower QOL mean scores were observed in social relationships (13.2 ± 2.5) and environment (13.1 ± 1.9) domains. A significant difference however, was observed in mean QOL scores in the level of independence domain among women

(14.4±1.9) compared to men (13.9±1.7; p=0.028). The researchers therefore concluded that lower quality of life in the environment and social relationships domains may be suggestive of stigma and discrimination, as well as poor living conditions, in the PLWHA physical environment.[39, 89] Another cross-sectional study in Kwara State, Nigeria involved 160 patients selected from the population of 616 HIV/AIDS-positive patients receiving services and care from Sobi Specialist Hospital, Ilorin.[90] The patients were interviewed using a pre-tested, structured questionnaire to obtain information on socio-demographic status and treatment variables. The WHOQOL-BREF was used to assess the QOL of these patients. The overall mean scores for health-related QOL were 72 for the physical domain, 67 for the psychological domain, 65 for the environment domain, and 47 for the social domain. Significant differences were observed in all domains among patients who had received 12 months of antiretroviral therapy compared with those who had just begun therapy. Marital status, fewer pills, and longer duration of therapy appeared to predict better QOL in this study.

A cross sectional study was carried out in out-patient clinic at a premier tertiary health center in North India, to determine the impact of HIV/AIDS on the QOL of patients in North India.[28] Sixty-eight consecutive HIV/AIDS patients attending Medicine outpatient department and/or admitted to the wards of All India Institute of Medical Sciences were administered a structured questionnaire by the HIV nurse coordinator. QOL was evaluated using the WHOQOL-Bref instrument. The overall QOL mean score on a scale of 0-100 was found to be 25.8. Similarly, on the scale of 0-100 the mean scores in the four domains of QOL in descending order were social (80.9); psychological (27.5); physical (17.7) and environmental domain (11.65). There was a significant difference in QOL in the physical domain between asymptomatic patients and patients with AIDS defining illnesses (14.6 vs10.43 p< 0.001) and asymptomatic(14.6) and early

symptomatic 12 patients (p=0.014). QOL in the psychological domain was significantly poorer in early symptomatic (12.1) and AIDS patients (12.4) as compared to asymptomatic individuals (14.2). A significant difference in QOL scores in the psychological domain was observed with respect to the educational status (p< 0.037) and income of patients (p< 0.048). Significantly better QOL scores in the physical (p< 0.040) and environmental domain (p< 0.017) were present with respect to the occupation of the patients. Patients with family support had better QOL scores in environmental domain. These findings were in agreement with a study in Sao Paulo, Brazil [91] where scores of the four domains (physical, psychological, social relationships and environment) were very similar and higher income was significantly associated to higher scores in all domains of quality of life, except for the social relationships domain. Subjects with CD4+ cell counts below 200 cells/mm^3 had lower scores for the physical domain.

The investigators concluded that QOL is associated with education, income, occupation, family support and clinical categories of the patients.

2.12 Health Related Quality of Life among HIV/AIDS and TB co-infected Patients
The prevalence of TB among HIV/AIDS patients in a Nigerian Teaching Hospital was found to be 13.8%.[92] The impact of tuberculosis infection on the HIV situation is obviously most serious when the prevalence of tuberculosis infection in young adults who are at risk of HIV infection is high.

In a Ugandan study which compared HRQOL among 133 patients with confirmed Pulmonary TB and known HIV status,[93] a translated and culturally adapted standardized 35-item MOS instrument was administered by trained interviewers and the VAS was used to cross-validate the MOS. The study found no difference between the HRQOL of HIV-positive TB patients and

HIV-negative TB patients. Based on this, the researchers reported that it is likely HIV has a small impact on the quality of life of TB patients.

However, in another cross-sectional study carried out by Deribew et al in Ethiopia,[94] among 467 HIV patients and 124 HIV/TB co-infected patients which compared QOL in HIV positive patients with and without TB using the WHOQOL-HIV BREF, it was found that HIV/TB co-infected patients had a lower quality of life in all domains as compared to HIV infected patients without active TB. Mean scores for physical health, social relationship and environmental health among co-infected patients were 13.26±4.3, 12.15 ± 3.1 and 11.7 ± 3.6 respectively. Depression, having a source of income and family support were strongly associated with most of the Quality of Life domains. Illiterates and males were more likely to be co-infected. In co-infected patients, individuals who had depression were 8.8 times more likely to have poor physical health OR = 8.8(95% CI: 3.2, 23) and 5 times more likely to have poor social relationships [OR = 5.3, (95%CI: 2.3, 14.2)] as compared to individuals who had no depression. Family support was associated with social relationships in HIV patients with and without co-infection (P < 0.001). Educational status was significantly associated with the environmental QOL domain. Literate individuals were 4 times more likely to have good QOL as compared to illiterate ones, OR = 4, (95% CI: 2.3, 7.3). High perceived stigma was associated with poor psychological health in HIV/TB co-infected and HIV patients (P < 0.05). Internal consistency measured with Cronbach's alpha had high value for most domains (α > 0.7). However, social relationship had a lower internal consistency (α = 0.57) as compared to others.

A similar cross-sectional study involving 491 consecutive PLWHA aged ≥ 18 years attending a dedicated clinic in South-west Nigeria [95] where WHOQOL HIV-BREF was used to measure QOL, reported participants with HIV/TB had significantly lower QOL in the physical,

psychological and level of independence domains when compared with PLWHA without TB. This finding was consistent with that by Deribew et al.[94] However, there were no significant differences in the mean scores in the social relationship, environment and spirituality domains. It is believed that the occurrence of two stigmatizing diseases can impact negatively on the QOL of the patients. Unlike the study by Deribew et al, they found a significant association between CD4 count and QOL with participants with CD4 count $\geq$ 350 cells/mm3 reporting better QOL in the physical, psychological and level of independence domains.

2.13 Factors that affect Quality of Life
To improve adherence and treatment outcomes, it is important to identify and address factors affecting the quality of life of adults with HIV and/or TB. Several factors which include age, gender, marital status, income as well as educational levels, influence the quality of life of patients with HIV and tuberculosis and have been widely studied. Existing data also suggest physical manifestations, antiretroviral therapy, psychological well-being, social support systems, coping strategies, spiritual well-being, and psychiatric co-morbidities are important predictors of QOL in this population.[96] Some of these studies are reviewed in this section.

A study conducted in Brazil to identify factors associated with increased levels of self-reported quality of life among HIV-infected patients on antiretroviral therapy using a WHOQOL-BREF instrument.[97] Overall quality of life was classified as 'very good/good' by 66.4% of the participants four months after initiating treatment, while 33.6% classified it as 'neither poor nor good/poor/very poor'. Logistic regression indicated that >8 years of education, none/mild symptoms of anxiety and depression, no antiretroviral switch, lower number of adverse reactions and better quality of life at baseline were independently associated with good/very good quality of life over four months of treatment.

Tuberculosis and HIV are both diseases associated with stigma worldwide. There have lots of efforts to reduce it by raising awareness and understanding of the disease. As a result, people infected face negative attitudes or isolation which affects their health-related quality of life. Lack of social support and stigma is a major challenge to effective prevention, management and control of HIV and TB. A study on South African adults on highly active antiretroviral treatment for HIV infection found out that, participants with more advanced disease (higher baseline viral loads and lower baseline CD4 counts) were less likely to report a decline in health-related quality of life than those with early disease. It was the relatively well patients entering into the programme who were at greatest risk of experiencing negative health related quality of life.[98] This difference in health related quality of life could have been due to counseling and other social support services that were rendered at the treatment centre. The importance of social support to the quality of life of HIV-infected individuals in a society was also reported in a study in Venezuela. Social support was significantly associated with health related quality of life domains.[99] Another study examining characteristics related to social support and antiretroviral medication adherence, used a descriptive cross-sectional study to explore the nature of the relationships among social support and other selected variables, including socio-demographic variables, quality of life, and adherence.[100] One hundred and forty nine study participants over the age of 18 years receiving treatment for HIV/AIDS were recruited at four outpatient settings in Durban, KwaZulu-Natal province of South Africa. It was found that social support scores on the Medical Outcomes Study Social Support Survey were moderate (Mean=64.4 ± 14.7) among the study participants but the number of close friends and family which correlated significantly with a high sense of social support still reported low scores on the Social Functioning Scale. The researchers concluded that a supportive social network is essential for those living with

HIV/AIDS. The implication from the study is that number of friends and family has little to do with social support in areas with stigma and discrimination.

In India, a study was done to evaluate QOL and relations between QOL, demographic and socio-cultural characteristics in active and inactive tuberculosis outpatients.[101] It was found that males, single status, patients with high level of education, patients with no co-morbidities had significantly (p<0.05) higher QOL scores. Positive correlations were also found with monthly income, daily sleep period and treatment period while age had a negative correlation with QOL. Determining the health state of a South Australian population, it was observed that males scored higher than females on each of the scales. Increase in age lead to reduction in the mean scores on scales which have been found to measure aspects of physical functioning (physical functioning, role limitations, bodily pain and general health perception) but not in aspects of mental health (vitality, social functioning, and emotional health).[71] Assessing the socioeconomic status and age variations in HRQOL amongst the general population in the United States of America it was found that income had a statistically significant association with measures of HRQOL and self-rated health. People in the lowest income group (<$20,000) had worse HRQOL than those with greater income at every age group.[70] It has been estimated that a person with TB loses an average of about 20 to 30 percent annual household income to the illness.[1] Those with less than a high school education had worse HRQOL than those with higher levels of education at all ages; education showed a statistically significant association with HRQOL, and self-rated health measures with each age group.[102]

In Nigeria, QOL has been found to be determined by education, income, family support, HIV serostatus, and patient age.[103] In Lagos state, a descriptive cross-sectional study was carried out at the chest clinic of Lagos State University Teaching Hospital Ikeja to determine the effect of

socio-demographic and economic factors on the health related quality of life of patients with tuberculosis.[104] A total of 260 consecutive patients with TB on anti TB medications who consented were recruited into the study between June and September 2009. Information was obtained with an interview based questionnaire which sought information on the socio-demographic and economic characteristics. The WHOQOL-BREF questionnaires were used to collect information on quality of life. Gender had no significant effect on physical health and environmental domain of the patients however, males had significantly lower scores than females in the Psychological and social relationships domains. Older patients had lower scores in all domains except the environment. There was a significant association between income levels, educational levels and the quality of life.

A study conducted in southeastern Nigeria to examine the pervasiveness of poverty among people living with HIV/AIDS, reported that poverty is a prevalent issue among people living with HIV/AIDS.[105] A total of 154 Igbo people residing in southeastern Nigeria, comprising 50% people living with HIV/AIDS and 50% medically diagnosed HIV-negative individuals, participated in this study. Results indicated that there is a statistically significant difference between PLWHA and those that were HIV-negative, with regard to their standard of living, with F (1153) =23.67; $p<.000$; poverty, with F (1153) =05.76; $p<0.004$; but not with household poverty, with F (1153) =0.772; $p<0.487$.This study suggests that HIV/AIDS negatively impacts individuals' income and expenditure and increases income inequality.

Physical exercise is a factor that may be related to HRQOL based on studies relating obesity with quality of life. A study on exercise participation and QOL in Nigerian women of menopausal age, reported that women who were active regularly had better HRQOL scores than the controls.[106]

2.14 Wellbeing among HIV patients

In a current New-York study,[107] researchers explored the association between HIV stigma mechanisms and indicators of health and well-being among People Living with HIV/AIDS. These associations were explored using both self-report and medical record data among a sample of PLWHA currently participating in HIV treatment in the Bronx, New York. Results demonstrate that internalized HIV stigma had the strongest associations with indicators of affective health and well-being (i.e., greater helplessness regarding, lower acceptance of, and lower perceived benefits of HIV), as well as indicators of behavioral health and well-being (i.e., greater days in medical care gaps and marginal greater likelihood of ARV non-adherence). Anticipated HIV stigma was associated with an indicator of physical health and well-being (i.e., greater likelihood of chronic illness co morbidity), and enacted HIV stigma was also associated with an indicator of physical health and well-being.[107]

In another South African study which compared the health correlates of HIV-infected to HIV-affected participants,[108] health and well-being status was measured using disability index, quality of life and composite health score. It was found that income and household wealth status were stronger correlates of quality of life. HIV-infected participants reported better functional ability, quality of life and overall health state than HIV-affected participants. Women HIV-infected (aOR 0.15, 95% confidence interval (CI) 0.08–0.29) and HIV-affected (aOR 0.20, 95% CI 0.08–0.50), were significantly less likely than men to be in good functional ability and overall health state.

The importance of spiritual beliefs and the role of Existential wellbeing in the HRQOL was highlighted in a descriptive, cross-sectional study in the United States[109] which examined associations between spiritual well-being (SWB) and its components, existential well-being

(EWB) and religious well-being (RWB), and dimensions of HRQOL among a non-random sample of 118 African American HIV-positive women, a secondary analysis of data from two similar studies were conducted. The result showed that Existential well-being was significantly positively (β =.74; p=.014) associated with the physical composite of HRQOL and accounted for a significant amount of unique variance (10.0%) beyond that explained by socio-demographic variables, religious well-being (RWB), HIV medication adherence, CD4 cell count and percentage, HIV viral load, and depressive symptoms. EWB was also significantly positively (β =.57; p=.024) associated with the mental health composite of HRQOL. Depressive symptomatology was also significantly inversely (β =.40; p=.004) associated with mental HRQOL. EWB accounted for a significant amount of additional variance (6.3%) beyond that explained by other variables.[109]

Studies have shown that psycho-social factors and social support influence health outcomes among HIV positive individual. In South-western Nigeria, using qualitative participatory methodology, 50 HIV positive people, 8 health personnel and 32 care providers were interviewed to explore how care and social support affect wellbeing among PHLWA. Analysis of data used the grounded theory (GT) approach to identify themes, which are considered crucial to the wellbeing of PLWHA. The findings highlight several factors, apart from antiretroviral drugs, that impact the wellbeing of PLWHA in southwest Nigeria. These include concerns about deteriorating physical health, family and children's welfare, pervasive stigma, financial pressures and systemic failures relating to care among others.[110]

CHAPTER THREE

3.   METHODOLOGY

3.1 Study Area

The study was carried out in the Anti-Retroviral (ARV) Clinic of the University of Port-Harcourt

Teaching Hospital (UPTH), Rivers State. Rivers State in the south-south geopolitical zone of

Nigeria and has 23 Local Government Areas. It is bounded on the South by the Atlantic Ocean,

to the North by Imo, Abia and Anambra States, to the East by Akwa-Ibom State and to the West

by Bayelsa and Delta states. The State has a total population of about 5.18 million, projected

from 2006 census with a growth rate of 3.0%.and is home to many ethnic groups: Ikwerre, Igbo,

Ijaw, Kalabari, Etche, Ogba, Ogoni and others. Rivers State with a HIV/AIDS prevalence of

15.2%[6] (according to the National Reproductive Health Survey), is not exempt from the

HIV/AIDS pandemic prevalent in Sub-Saharan Africa.

3.1.1 Study Setting

There are currently eight treatment facilities offering HAART services within the State. The

University of Port-Harcourt Teaching Hospital is one of such facilities. The HIV/AIDS

programme of the hospital is funded by the Federal Government of Nigeria with support from

the Family Health International (FHI-360), a non-governmental organization implementing the

PEPFAR funded Strengthening of Integrated Delivery of HIV/AIDS Services Project in the

State. Other centres where HIV/AIDS care is provided include the Braithwaite Memorial

Specialist Hospital, the Bonny General Hospital, Kelsey Harrison medical Centre, the Ahoada

General Hospital, Bori General Hospital, Health of the Sick Catholic Hospital and Military

Hospital. These clinics cater to a huge volume of patients on a daily basis and provide free

antiretroviral treatment to all those accessing care.

The University of Port Harcourt Teaching Hospital is a 750 bed tertiary institution owned and managed by the Federal Government of Nigeria. The Anti-retroviral Clinic is domiciled at the Medical Outpatient Clinic of the hospital and is co-managed by the Departments of Internal Medicine, Haematology and Community Medicine. The clinic was previously run twice weekly but was recently extended to daily clinics as a result of huge volume of patients. At present, the hospital has a data base of about 12,000 registered HIV/AIDS patients in ART. The clinic attends to an average of 60-70 HIV patients daily, and about 50% of these patients are co-infected with TB. It has one consultant, two nurses, an average of six doctors per clinic day, one ward maid, three pharmacy staff and two records staff attached to it. Members of the counselling and social welfare department are also involved in the clinic. There are two designated consulting rooms, a pharmacy and a waiting area for clients. Each clinic session starts with general health education sessions conducted by the nurses and counselors after which the clients are given the opportunity to see a doctor or simply proceed to the pharmacy for drug refills depending on their preference. New clients are seen, investigated and commenced on HAART if eligible.

Apart from referral through the General Out-patient (GOPD), entry into the ARV Clinic can be by referral from the DOTS clinic. All TB suspects/patients are offered HIV Counselling and Testing, and if confirmed positive, they go on to receive HIV/AIDS care. Similarly, all HIV positive clients received in the ARV Clinic are screened for TB, and those diagnosed with active TB are enrolled into the DOTS programme. This two way referral is in line with the NTBLCP guidelines for treatment and control of HIV/TB in Nigeria.[9]

The University of Port Harcourt Teaching Hospital was purposively selected as the only centre for this study because it has the largest population of HIV/AIDS patients on its database.

3.2 Study Design

The study was a comparative, cross-sectional study of the Health Related Quality of Life of adult

patients with HIV/AIDS and those with HIV/AIDS and tuberculosis co-infection attending the

ARV clinic in University of Port Harcourt Teaching Hospital, Rivers State.

3.3 Study Population

Adult patients 18 years and above diagnosed of HIV/AIDS with or without Tuberculosis co-

infection attending the ARV clinic in University of Port Harcourt Teaching Hospital

3.3.1 Inclusion criteria

1. Adult HIV patients 18 years and above with or without TB co-infection

2. Patients with confirmed HIV-positive status who had received Anti-Retroviral drugs for at

least a month prior to the study. This is to allow adequate time for the patients to adapt to the

drugs

3. Clients who gave written informed consent for the study

3. 3.2 Exclusion criteria

1. HIV positive clients who were yet to commence ART or had been on therapy for less than 1

month before the study. These patients may not have adequately adapted to the antiretroviral

drugs.

2. Pregnant women and terminally ill/ debilitated patients including patients on admission.

3. Patients with other co-morbidities except for the comparative group of HIV/AIDS and TB co-

infection

3.4 Sample Size Determination

The formula for calculating sample size to determine a difference between 2 proportions was employed as follows.

$$n \qquad \frac{(u+v)^2 \ [\ (p_1 (100-p_1) + p_2 (100-p_2) \ ]}{(\ p_1-p_2 \ )^2}$$

Where   n = Minimum sample size for each group

               u = Power at 90% = 1.28

               v = Significance level at 5% = 1.96

               p_1 = Proportions of HIV/AIDS patient assumed to have good health-related quality of life = 50.38% (derived from a previous study)[111]

               p_2 = Proportions of patients with HIV/AIDS and Tuberculosis co-infection with good Health-Related Quality of Life = 30.97% (derived from the same study)[111]

$$n = \frac{(1.28 + 1.96)^2 \ [50.38(100-50.38) + 30.97(100-30.97)]}{(50.38-30.97)^2}$$

$$n = \frac{(1.28 + 1.96)^2 \ [50.38(100-50.38) + 30.97(100-30.97)]}{(50.38-30.97)^2}$$

$$= \frac{(3.24)^2 \ [(50.38 \times 49.62) + (30.97 \times 69.03)]}{(19.41)^2}$$

$$= \frac{(10.5) \ (2499.86 + 2137.86)}{376.75}$$

$$= \frac{(10.5) \ (4637.72)}{376.75}$$

$$= \frac{48696.06}{376.75} = 129.25$$

Correcting for non-response (rate of 10%);

New sample size = n x 100/100-x (where x is non response rate of 10%)

Therefore minimum required sample size is 129.3 x100 /90 which is

n = 144 per group.

3.5 Sampling Technique

Recruitment of participants was by Simple Random Sampling. This was done over a 3 months (12 week) period such that approximately 12 clients was recruited per group per week (ie 24 clients per week) i.e. total sample size/ 12 weeks = number of patients to be enrolled per week;

(144/12 $\cong$ 12 patients per group per week $\cong$ 3 patients per group per day ie 6 patients per day).

The records officer has a list of HIV and HIV/TB who are to present for each day, by appointment. A list of HIV patients as well as HIV/TB co-infected patients presenting for that day was then constructed with the help of the records officer. The names on the list were numbered serially, and with the use of table of random numbers, two digit number was picked and was used to select patients for the study, for example if the number 02 was picked from the table of random numbers, the second patient on the list was selected for the study. Three patients were selected and interviewed from each group daily, until the required sample size was reached. Only those who met the eligibility criteria were enrolled into the study until 288 respondents were interviewed.

Patients' names were recorded to avoid duplication of records on any individual patient. The names were however removed at the time of analysis.

3.6 Study Instruments

A structured interviewer administered questionnaire with the WHOQOL-BREF was used to collect information from the respondents.

The questionnaire used consists of five sections lettered A-E

Section A: Socio-demographic details- age, sex, marital status, ethnicity, religious background, family type and household size.

Section B: Socio-economic details - highest level of education, current employment status, occupation, ownership of household assets, household monthly income, accommodation status, number of dependents, crowding density and cost of transport to clinic.

Section C: Medical and Social history - duration of anti-retroviral treatment, lifestyle history- smoking, alcohol consumption, exercise and sexuality.

Section D: WHO Quality of Life (WHOQOL-BREF) assessment.[79] The WHOQOL-BREF is a 26-item generic questionnaire, a short version of the WHOQOL-100 assessment[78,79]. It measures four broad domains namely; physical health, psychological well-being, social relations and environment.[15]

Physical health - This comprises 7 items that assess areas such as the presence of pain and discomfort, dependence on substances or treatments, energy and fatigue, mobility, sleep and rest, activities of daily living, and perceived working capacity.

Psychological well-being - comprises 6 items that assess areas such as patient's affect, both positive and negative, self-concept, higher cognitive functions; body image and spirituality.

Social relations -There are 3 items that assess areas such as social contacts, family support, the ability to care for family and sexual activity.

Environment - This comprises 8 items that assess aspects such as freedom, quality of home environment, physical safety, security and financial status, involvement in recreational activity, health and social care as applicable to the quality and accessibility thereof.

There are two other items that are measured separately: (1) patient's overall perception of QOL, and (2) overall perception on his/her health. Each item is categorized into a five point Likert scale ranging from 1-5, with 1 being the lowest possible state and 5 being the highest. Domain scores are scaled in a positive direction; higher scores denote higher QOL. The mean score of items within each domain is used to calculate the domain scores compatible with the scores used in WHO QOL-100 and subsequently transformed to a 0–100 scale.[112]

This instrument has been reported to be convenient, reliable and valid for use in large research studies to measure QOL in a wide variety of diseases. It has also been translated in different languages including Hausa and Yoruba and used in different cultural settings yielding comparable scores across different languages and cultures.[113,114] The WHOQOL-BREF has been well validated for measuring quality of life in people living with AIDS across different settings and has been extensively used by similar studies elsewhere.[39,89,90,115]

Section E: The Quality of Wellbeing Scale

The QWB-SA includes five sections.

Part 1: Acute and Chronic illness (Q1-Q4); This assesses the presence/absence of 19 chronic symptoms (e.g., blindness, speech problems). These chronic symptoms are followed by 25 acute

(or more transient) physical symptoms (e.g. headache, coughing, pain), and 14 mental health symptoms, and behaviors (e.g., sadness, anxiety, irritation) and other symptom that was not mentioned on the QWB scale.

Parts II to V queries subjects on their functional health status, including the subject's ability to perform self-care activities (Q5), assessment of a person's mobility, including use of transportation (Q6), physical activity (Q7), and social/usual activities (Q8), including completion of role expectations (e.g. work, school, or home). These questions refer to a three-day time period that corresponds to the three days directly preceding the day the questionnaire is completed. It is important that the subject understand the specific days s/he is being asked about. If the subject did not experience a particular symptom in the past 3 days, s/he would fill in the circle corresponding to "No Days." Symptoms are reported for each of the 3 days separately. For example, if the subject experienced the symptom 2 days ago but not yesterday or three days ago, s/he would fill in only the circle corresponding with 2 days ago; if the subject experienced the symptom on all of the past 3 days s/he would fill in a circles for each of the 3 days separately.

3.7 Data Collection Methods

Three research assistants were trained to administer the questionnaires to the patients daily. When patients arrive at the ARV clinic, they drop their personal cards with the record officer to retrieve their case files. At this point, a rapid assessment was done to identify recent co-infected patients. This involved asking about history of chronic cough or attending the adjacent (DOTS) clinic or taking drugs for cough, which turned their urine red. Questionnaires were administered after sampling. Data was collected over a three months period.

3.8 Plan for Data Management

3.8.1 Measurement of Variables

Independent Variables

Age, Sex, Marital status, Ethnic group, Religion, Family type, Household size, Education, Employment status, Occupation, Monthly income, ownership of a house, living conditions, Sexuality. This was determined via the questionnaire.

Dependent Variables

Health-related quality of Life and Well-being as measured by WHOQOL-Bref and QWB-SA. WHOQOL-Bref: The sum of items (questions) within each domain was divided by the number of items in that domain to get the mean score. These mean score was then multiplied by 4 as shown below to derive the domain score.

Physical domain = (Q3 + Q4 + Q10 + Q15 + Q16 + Q17 + Q18)/7 x 4

Psychological domain = (Q5 + Q6 + Q7 + Q11 + Q19 + Q26)/6 x 4

Social relationship domain = (Q20 + Q21 + Q22)/3 x 4

Environment domain = (Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25)/8 x 4

The domain scores will then be transformed to a 0- 100 scale (according to WHO guideline) to be comparable with the scores used in the WHOQOL-100 using the formula;

Transformed score = (score-4) x (100/16).[78]

The higher the domain score, the better the quality of life of the respondents

Each item included on the QWB-SA is described as a health state to be rated on a 0 to

100 scale. Subjects will be asked to use "0" as an anchor for death/worst possible health state and

"100" for optimum health (no dysfunction or symptoms).Preference weights was assigned to most items. To arrive at a score for the QWB the preference weights was totaled and then subtracted from 1.000. The situation "No Days" will have of 0. Missing and/or inconsistent data was coded as "No Days" (i.e. 0).

QWB-SA.

Part I - Acute & Chronic Symptoms (CPX section):

The most heavily weighted item for each day in this entire section was selected and entered in the CPX column for the corresponding day in the formula below. Items marked "Yes" on part I, question 1 (items a-k plus "health aids"), are coded as present on all three days.

Part II – Self Care & Part III Mobility (MOB section): Mobility, for scoring purposes includes Part II – Self Care question A and Part III – Mobility questions a, b, and c. the heaviest weight for each day from these four questions was entered in the MOB column for the corresponding day in the formula below.

Part IV – Physical Activity (PAC section):

The heaviest weight for each day from this section was entered into the PAC column for the corresponding day in the formula below.

Part II – Self Care & Part V – Usual Activity (SAC section):

Usual activity, for scoring purposes, includes Part II – Self Care question b and Part V – Usual Activity questions a, b, and c. The heaviest weight for each day from these four questions was entered in the SAC column for the corresponding day in the formula below.

QWB – SA Form 1.04 SCORING FORMULA

1 – (CPXwt) – (MOBwt) – (PACwt) – (SACwt)

DAY	CPX	MOB	PAC	SAC	DAILY QWB
3	Score = 1 - ( )	- ( )	- ( )	- ( )	= _____
2	Score = 1 - ( )	- ( )	- ( )	- ( )	= _____
1	Score = 1 - ( )	- ( )	- ( )	- ( )	= _____

Total Score _____

Total Score_____ / 3 Days = Average Self-Administered QWB Score_____

3.8.2 Data Analysis

Data was analyzed using SPSS version 19 statistical software. Demographic, socio-economic, medical and lifestyle factors were presented with frequency tables. Domain scores were manually calculated, entered and cross-checked with the computer. The scoring of HRQOL and wellbeing assessment was interpreted by using the mean as the cut off for data that has normal distribution or the median for data that are skewed. Scores below the mean/median was graded as poor while scores above the mean or median as good.[78]

Means and standard deviations was calculated for continuous variables, the independent student's t-test was used to compare difference between mean scores.

Chi-square test for associations was used to test for associations between the demographic; socio-economic; medical and lifestyle history and global domain of health related quality of life scores. A p-value of 0.05 was considered statistically significant. Correlation and multivariate analysis was used to assess the relationship and contribution of the domain scores to the HRQOL global score.

3.9 Ethical Consideration
Ethical approval was obtained from the Ethical and Research Committee of the University of Port- Harcourt Teaching Hospital before commencing the study. Written permission to conduct the study was sought from the management of the hospital. The study was explained to the ARV clinic staff. A written informed consent was obtained from each participant before each interview (see Appendix I). All study participants were informed of the benefits of the study and assured of their confidentiality. Counsellors and research assistant were trained on the need to maintain confidentiality so as to avoid issues of stigma and discrimination associated with HIV-AIDS. None of the data record sheets or questionnaires had client names as codes were assigned to each client. All clients were made aware of their right to withdraw from the trial at any time without fear of any negative consequences.

3.10 Limitations

Using client self-report as a measure of QOL is limited by recall bias and a tendency for study participants to conceal certain information. As such, some researchers query that it may not be the best measure of QOL. Nevertheless, studies have shown that self-assessed health status has provided a more powerful predictor of mortality and morbidity than many objective measures of

health.[60] To minimize this limitation, the study participants were allowed enough time to respond to questions and to prod their memories. Where questions are not clearly understood, they were explained in Pidgin English which is a popular means of communication in the State. Another limitation is the use of one hospital which does not make the result generalizable and therefore, not representative of the QOL of HIV or HIV/TB patients in Rivers State.

CHAPTER FOUR

4.   RESULTS

Table 1a: Socio demographic characteristics of respondents

Variables	HIV N=144 (%)	HIV/TB N = 144 (%)	X^2	P -value
Age group (years)				
≤ 24	12 (8.3)	18 (12.5)	3.157	0.532
25-34	66 (45.8)	54 (37.5)		
35-44	37 (25.7)	41 (28.5)		
45-54	22 (15.3)	21 (15.6)		
≥55	7 (4.9)	10 (6.9)		
Mean age	35.69 ± 10.28	36.03 ± 10.92		
Sex				
Male	69 (47.9)	63 (43.8)	0.503	0.478
Female	75 (52.1)	81 (56.3)		
Marital Status				
Single	66 (45.8)	70 (48.6)	0.488	0.922**
Married	62 (43.1)	58 (40.3)		
Separated/Divorced	3 (2.1)	2 (1.4)		
Widowed	13 (9.0)	14 (9.7)		

**Fischer's exact p-value

The mean age of respondents with HIV only and those with HIV/TB co-infection was 35.69 ±

10.28 years and 36.03 ± 10.92 years respectively. Majority of the respondents fell within the age

group of 25-34 years in HIV only (45.8%) and in co-infected groups (37.5%). More than half of

the respondents in both HIV only group (52.1%) and in the co-infected group (56.3%) were

females.

Table 1b: Socio demographic characteristics of respondents (contd)

Variables	HIV N=144 (%)	HIV/TB N = 144 (%)	X^2	p-value
Ethnicity				
Igbo	52 (36.1)	68 (47.2)	8.229	0.144
Ikwere	24 (16.7)	23 (16.0)		
Ijaw	19 (13.2)	14 (9.7)		
Yoruba	9 (6.3)	2 (1.4)		
Hausa	3 (2.1)	5 (3.5)		
Others	37 (25.7)	32 (22.2)		
Religion				
Christianity	133 (92.4)	136 (94.4)	3.033	0.386
Muslim	10 (6.9)	5 (3.5)		
Traditional Religion	1 (0.7)	2 (1.4)		
Family Type				
Monogamous	114 (79.2)	111 (77.1)	0.183	0.183
Polygamous	30 (20.8)	33 (22.9)		
Household Size				
≤ 4	53 (36.8)	61 (42.4)	0.929	0.335
> 4	91 (63.2)	83 (57.6)		
Mean Household Size	5.96 $\pm$ 4.0	5.88 $\pm$ 3.93		0.16*

* Student t-test p-value

The respondents in the HIV only group were mainly single (45.8%), Igbo (36.1%), Christian (92.4%) and in monogamous families. The HIV/TB co-infected group had similar characteristics with majority being single (48.6%), Igbo (47.2%), Christian (94.4%), and 77.1% in monogamous families. Majority of respondents had household sizes greater than four in both groups. There were no statistically significant differences in age ($p>0.05$), sex ($p>0.05$), marital status ($p>0.05$), ethnicity ($p>0.05$), religion ($p>0.05$) and household size ($p>0.05$), between the two groups.

Table 2a: Socio-economic characteristics of respondents

Variables	HIV N=144 (%)	HIV/TB N=144 (%)	X^2	p-value
Level of Education				
No Formal	3 (2.1)	9 (6.3)	7.446	0.059
Primary School	12 (8.3)	21 (14.6)		
Secondary School	65 (45.1)	65 (45.1)		
Tertiary	64 (44.4)	49 (34.0)		
Current Employment status				
Employed	84 (58.33)	86 (59.7)	0.57	0.811
Unemployed	60 (41.67)	58 (40.3)		
Type of Employment				
Government	12 (14.3)	13 (15.1)	0.390	0.823
Private Self	50 (59.5)	54 (62.8)		
Private Non-self	22 (26.2)	19 (22.1)		
Social Class				
I – Professional	13 (9.0)	8 (5.6)	2.671	0.614
II – Other professionals	18 (12.5)	15 (10.4)		
III – Skilled workers	23 (16.0)	31 (21.5)		
IV – Semi-skilled	43 (29.9)	44 (30.6)		
V – Unskilled	47 (32.6)	46 (31.9)		
Household monthly income				
≤ 30,000	22 (15.3)	16 (10.4)	34.62	0.344
30,001 – 50,000	10 (6.9)	17 (11.8)		
50,001 – 100,000	15 (10.4)	17 (11.8)		
> 100,000	22 (15.3)	8 (5.6)		
Do not know	75 (52.1)	87 (60.4)		
Median Household Income	50,000 (5,000-600000)	55,000 (3,500-500000)		

Most of the respondents (45.1%) with HIV and HIV/TB co-infection had secondary education. Majority of respondents who were currently employed among HIV clients (59.5%) and HIV/TB co-infected group (62.8%) were self employed. About two thirds of respondents (62.5%) in both groups were in the lower socio-economic classes of IV and V. Majority of the respondents in HIV group (52.1%) and HIV/TB co-infected group (60.4%) do not know their household monthly income. There were no significant differences in level of education (p=0.059), type of employment (p=0.823), and social class (p=0.614) between the two groups.

Table 2b: Socioeconomic Characteristics of respondents (Contd)

Variables	HIV N=144 (%)	HIV/TB N = 144 (%)	X^2	p-value
Number of dependents				
<2	52 (36.1)	56 (38.9)	1.026	0.599
2-4	42 (29.2)	46 (31.9)		
>4	50 (34.7)	42 (29.2)		
Mean dependents	3.3 ± 2.9	3.0 ± 2.8		0.466*
No of persons sleeping per room				
≤ 2	39 (27.1)	36 (25)	0.162	0.687
>2	105 (72.9)	108 (75)		
Mean Crowding density	3.0 ± 0.99	3.1 ± 1.19		0.74*
No sleeping in Room with Respondent				
≤ 2	88 (61.1)	79 (54.9)	1.15	0.283
>2	56 (38.9)	65 (45.1)		
Mean crowding density	1.6 ± 1.12	1.4 ± 0.94		0.20*
Ownership of a house				
Yes	40 (27.8)	35 (24.3)	0.451	0.502
No	104 (72.2)	109 (75.7)		
Proximity to treatment Centre				
Live within the LGA	75 (52.1)	81 (56.2)	0.503	0.478
Live Outside the LGA	69 (47.9)	63 (43.8)		
Mode of Transport to Treatment Centre				
Private Vehicle	36 (25)	32 (22.2)	0.757	0.860
Commercial taxi/ bus	106 (73.6)	111 (77.1)		
Others (motorcycle, boat)	2 (1.4)	1 (0.69)		
Estimated Transport Cost to and fro the hospital	n=120	n=132		
≤ 300	39 (32.5)	38 (28.8)	1.101	0.577
301 – 1000	67 (55.8)	73 (55.3)		
>1000	14 (11.7)	21 (15.9)		
Mean cost of transport	819 ± 1137.9	811.5 ± 925.6		0.95*

*Student t-test p-value

The average number of dependents in each group was three. About three-quarters (72.9% and 75%) of the respondents in HIV and HIV/TB co-infected group respectively, had more than two persons sleeping in a room. Most of the respondents in HIV group (61.1%) and co-infected

group (54.9%) had at most, two people sleeping in the same room with them. There was no statistically significant difference in the mean dependents (p=0.466) and crowding density (p=0.74) between the two groups. Majority of the HIV (52.1%) and HIV/TB co-infected persons (56.2%) live within the LGA. The main mode of transport was by commercial vehicle for both HIV (73.6%) and co-infected (77.1%) patients. The remaining respondents used private vehicles, motorcycles and boats or trekked to the hospital. The cost of transport to and fro the treatment centre was between 301-1000 naira for most of the respondents with HIV (55.8%) and in co-infected patients (55.3%). The mean difference in cost was not statistically significant (p=0.577).

Table 3: Distribution of respondents by their ARV Treatment History

Variables	HIV N=144(%)	HIV/TB N=144 (%)	X^2	p-value
Duration of Anti-Retroviral Treatment (Years)				
≤ 2	57 (39.6)	56 (38.9)	0.015	0.903
>2	87 (60.4)	88 (61.1)		
Mean duration of treatment	4.1 ± 3.45	4.3 ± 3.75		0.742*
Anti Tuberculosis Treatment				
Anti-Kochs's Treatment				
No anti-koch's treatment	-	123 (85.4)		
	-	21 (14.6)		
Out-of-Pocket ARV drug Purchase				
Yes	27 (18.8)	25 (17.4)	0.094	0.759
No	117 (81.2)	119 (82.6)		

*Student t-test p-value

More than half (60.4% and 61.1%) of the respondents in HIV and HIV/TB co-infected group respectively had received over two years of treatment. The mean duration of treatment was not significantly different (p=0.742) between the two groups. Most of the HIV/TB co-infected patients (85.4%) were taking anti-tuberculosis drugs. Within the course of their treatment, 81.2% of HIV patients and 82.6% of co-infected patients had made out-of-pocket purchase of anti-retroviral treatment.

Table 4: Distribution of respondents by their lifestyle history

Variables	HIV N=144(%)	HIV/TB N=144 (%)	X^2	p-value
Smoking Status				
Ever Smoked Cigarette				
Yes	23 (16.0)	30 (20.8)	1.133	0.287
No	121 (84.0)	114 (79.2)		
Currently Smoking	n=22	n=29		
Yes	8 (36.4)	15 (51.7)	1.192	0.275
No	14 (63.6)	14 (48.3)		
Years of Smoking (Current smokers)	n=8	n=15		
<10	5 (62.6)	9 (60)	0.014	1.000**
≥10	3 (37.5)	6 40		
Mean duration	8.25 ± 3.88	8.13 ± 4.54		0.741*
No of sticks per day(Current smokers)				
≤ 5	3 (37.5)	9 (60)	1.059	0.400**
>5	5 (62.5)	6 40		
Mean number of sticks smoked	7.88 ± 4.8	5.67 ± 3.1		0.82*
Years of Smoking (Ex-smoker)	n=15	n=13		
≤ 5	5 (53.3)	8 (61.54)	0.192	0.662
>5	10 (46.7)	5 (38.5)		
Mean no of years smoked	6.25 ± 3.12	6.34 ± 3.47		0.455*
Number of sticks (Ex-smoker)				
≤ 5	10 (62.5)	9 (64.3)	0.010	0.919
>5	6 (37.5)	5 (35.7)		
Mean number of sticks smoked	6.25 ± 3.5	6.34 ± 2.4		0.169*

**Fischer's exact p-value   * Student t-test p-value

Over three quarters of the respondents in both groups have never smoked cigarette. Among those

who have ever smoked, 36.4% and 51.7% of HIV and HIV/TB co-infected groups respectively

are currently smoking with a mean duration of smoking of 8 years in both groups. Among the ex-

smokers the mean duration of smoking did not differ significantly (p=0.455) between the HIV

clients (6.25 ± 3.12) and the HIV/TB co-infected (6.34 ± 3.47).

Table 4b: Distribution of respondents by their lifestyle history (contd)

Variables	HIV N=144 (%)	HIV/TB N=144 (%)	X^2	p-value
Alcohol Consumption				
Drink Alcohol	44 (30.6)	62 (43.1)	4.837	**0.028**
Do not Drink Alcohol	100 (69.4)	82 (56.9)		
Exercise				
Do Exercise	72 (50)	63 (43.8)	1.129	0.287
Do not Exercise	72 (50)	81 (56.2)		
Type of Exercise	n=72	n=63		
Aerobic	44 (61.1)	46 (73)	2.143	0.143
Anaerobic	28 (38.9)	17 (27)		

Less than a quarter of HIV clients (30.6%) and close to half of co-infected (43.3%) drink alcohol. This difference was statistically significant with p= 0.028. Majority of the co-infected patients (56.2%) and half of HIV clients (50%) exercised. Among those who exercised, aerobic exercise was more common among both HIV (61.1%) and co-infected clients (73%). There was no statistically significant difference (p=0.287) in exercise between the two groups.

Table 5: Distribution of respondents by their Sexual lifestyle

Variables	HIV N=144 (%)	HIV/TB N=144 (%)	X^2	p-value
No of Sex Partners in Lifetime				
≤ 1	39 (27.1)	37 (25.7)	0.072	0.789
> 1	105 (72.9)	107 (74.3)		
Mean no of sex partner	6.1 ± 11.73	5.3 ± 6.1		0.465!
No of Sex Partners in past 2months				
≤ 1	117 (84.8)	114 (87)	0.278	0.598
> 1	21 (15.2)	17 13		
Mean no of sex partner	1.06 ± 1.5	0.98 ± 1.48		0.691*
Relationship with most recent partner	n=97	n=91		
Legal Spouse	57 (58.8)	49 (53.9)	2.700	0.746**
Lover	26 (26.8)	30 (33.0)		
Co-worker	1 (1.0)	1 (1.1)		
Casual date	10 (10.3)	10 (10.9)		
Commercial Sex Worker	5 (2.1)	0 (0)		
Others	1 (1.0)	1 (1.1)		
Drink Alcohol Before Sex				
Yes	40 (27.8)	30 (20.8)	1.887	0.170
No	104 (72.2)	114 (79.2)		

*Student T-test p-value   **Fischer's Exact p-value

Majority of the respondents among HIV only group (72.9%) and co-infected group (74.3%) have had more than one sexual partner in their life time. The average number of sex partners in a lifetime is not statistically different (p=0.465) between the two groups. More than 80% of respondents in both groups have either had only one or no sexual partner in the past 2 months, and the average number of sex partners had reduced to 1 among the two groups. Among the sexually active, the most recent partner was a legal spouse in 58.8% of HIV and 53.9% of co-infected clients. Most respondents (72.2%) in the HIV only group and 79.2% of co-infected patients do not drink alcohol before having sex. There was no statistically significant difference in the number and relationship with sexual partners between the two groups.

Table 6: Mean Score of Health related Quality of Life Dimensions of respondents

HQOL Dimensions	HIV Mean ± SD	HIV/TB Mean ± SD	T-test	Students t-test p-value
Self-rated QOL	78.47 ± 17.39	75.83 ± 18.15	1.26	0.209
Satisfaction with Health	76.67 ± 19.50	75.56 ± 17.45	0.51	0.611
Physical Health	74.82 ± 16.19	70.01 ± 17.52	2.42	**0.016**
Psychological Health	71.09 ± 11.97	67.13 ± 12.15	2.79	**0.006**
Social Relationship	65.28 ± 24.40	61.63 ± 27.19	1.20	0.232
Environmental	61.89 ± 14.28	60.20 ± 14.31	1.00	0.316
Global Domain	68.27 ± 12.99	64.74 ± 14.36	2.19	**0.029**

The mean score for HRQOL domains score in descending order in the HIV only group were self rated health (78.47 ± 17.39), Satisfaction with Health (76.67 ± 19.50), Physical Health (74.82 ± 16.19), Psychological Health(71.09 ±11.97), Global Domain(68.27 ± 12.99), Social Relationship (65.28±24.40), Environmental(61.89±14.28). The mean scores for HRQOL domain in descending order among HIV/TB co-infected respondents followed similar pattern of Self-rated health (75.83±18.15), Satisfaction with Health (75.56 ± 17.45), Physical Health (70.01 ± 17.52), Psychological Health (67.13±12.15), Global Domain (64.74 ± 14.36), Social Relationship (61.63±27.19) and Environmental (60.20±14.31). The mean scores were significantly higher among HIV only respondents in the domains of Physical health (p=0.016), psychological health (p=0.006) and in the Global domain (p=0.029). Other domains and self-rated QOL scores between the two groups were not significantly different (p>0.05).

Table 7: Relationship between HRQOL Dimensions of respondents and HIV status

	HRQOL		X^2	p-value
	Good n (%)	Poor n (%)		
Self-rated QOL				
HIV	104 (72.2)	40 (27.8)	0.269	0.604
HIV/TB	100 (69.4)	44 (30.6)		
Satisfaction with Health				
HIV	109 (75.7)	35 (24.3)	0.165	0.684
HIV/TB	106 (73.6)	38 (26.4)		
Physical Health				
HIV	85 (59.0)	59 (41.0)	4.030	**0.045**
HIV/TB	68 (47.2)	76 (52.8)		
Psychological Health				
HIV	91 (63.2)	53 (36.8)	5.644	**0.018**
HIV/TB	71 (49.3)	73 (50.7)		
Social Relationship				
HIV	69 (51.9)	65 (48.1)	0.308	0.579
HIV/TB	66 (48.5)	74 (51.5)		
Environmental				
HIV	80 (55.6)	64 (44.4)	2.002	0.157
HIV/TB	68 (47.2)	76 (52.8)		
Global Domain				
HIV	86 (59.0)	58 (41.0)	2.349	0.091
HIV/TB	69 (48.9)	75 (51.1)		

The median score for social relationship (66.7), self rated health QOL (80) and satisfaction with health (80) was the same for HIV and HIV/TB co-infected groups. The median scores in HIV group were 78.6, 70.8, 62.5, and 68.7 and 71.4, 66.7, 59.4 and 66 in the HIV/TB group for the physical, psychological, environmental and global domains respectively. The distribution of scores was skewed, (Skewness is .83 and the kurtosis is 1.73. The standard error for the skewness is 0.20, the standard error for the kurtosis is 0.41. Both statistics are above two standard errors, which suggest that the data are not symmetric, and therefore not normally distributed) so the median was used as the cut-off for good and poor HRQOL.

The proportion of respondents with good QOL in the HIV only group in descending order was Satisfaction with health (75.7%), self-rated health (72.2%), Psychological (63.2%), Physical and Global domain (59%), Environmental (55.6%) and Social relationship (51.9%).

The proportion of respondents with good QOL in the HIV/TB group in descending order was Satisfaction with health (73.6%), self-rated health (69.4%), Psychological (49.3%), Global domain (48.9%), Physical and Environmental (47.2%) and Social relationship (48.5%).

The proportion of respondents with good QOL was significantly higher in the HIV group than in the co-infected group, in the physical health (p=0.045) and psychological domains (p=0.018).

Table 8: Correlation of HRQOL global Score on domain scores

Domain	HIV			HIV/TB		
	Constant (a)	Correlation coefficient (r)	p-value	Constant (a)	Correlation coefficient (r)	p-value
Physical	19.04	0.81	0.001	20.66	0.79	0.001
Psychological	15.52	0.65	0.001	18.34	0.65	0.001
Social	37.51	0.86	0.000	39.06	0.84	0.001
Environment	20.22	0.79	0.000	25.26	0.76	0.001

The social (r =0.86), physical (r =0.81), and environmental (r =0.79) domains showed strong positive correlations with global score (r >0.7), while the psychological domain (r=0.65) showed moderate correlations among HIV-only patients. All four domain contributed significantly (p<0.005) to the global domain. Similarly for the co-infected patients, the social (r = 0.84), physical (r = 0.79), and environmental (r = 0.76) domains showed strong positive correlations (r >0.7) with the global score, while the psychological domain(r=0.65) showed moderate correlations. Each domain determined the global score.

Table 9: Multiple Linear Regression of HRQOL global score on domain scores

Domain	HIV			HIV/TB		
	Regression Co-efficient (b)	t-test	p-value	Regression Co-efficient (b)	t-test	p-value
Constant		0.000	1.000		0.000	1.000
Physical	0.311	8.828	0.001	0.305	3.229	0.001
Psychological	0.230	7.027	0.001	0.212	2.493	0.001
Social	0.469	1.370	0.001	0.473	4.980	0.001
Environment	0.275	8.020	0.001	0.249	2.581	0.001

The four domains contributed significantly to the global domain (p<0.05) in both groups. Thus changes in the domain values are related to changes in the global domain. For HIV-only patients, with all other variables held constant, the social domain contributed the most variation (b=0.469) to the global score, followed by the physical domain (b=0.311), then environmental health (b=0.275) and then the psychological domain (b=0.230). Similarly, for HIV/TB co-infected patients the social domain also contributed the most variation (b =0.473) to the global score, followed by the physical health (b =0.305), then environmental domain (b=0.249), and the psychological domain (b = 0.212).

Table 10: Relationship between socio-demographic variables and global score

Variables	HIV N=144 Global Score			HIV/TB N=144 Global Score			X^2	p-value
	Good n (%)	Poor n (%)	Total n (%)	Good n (%)	Poor n (%)	Total n (%)		
Age group (years)								
≤ 24	7 (58.3)	5 (41.7)	12 (100)	7 (38.9)	11 (61.1)	18 (100)	0.480	0.488
25 – 34	40 (62.9)	26 (37.1)	66 (100)	25 (46.3)	29 (53.7)	54 (100)	3.581	0.058
35 – 44	23 (62.2)	14 (37.8)	37 (100)	24 (58.5)	17 (41.5)	41 (100)	0.174	0.677
45 – 54	10 (45.5)	12 (54.5)	22 (100)	11 (52.4)	10 (47.6)	21 (100)	0.021	0.650
≥55	4 (57.1)	3 (42.9)	7 (100)	4 (40.0)	6 (60.0)	10 (100)	0.419**	0.637**
	Fischer's exact p-value = 0.760			Fischer's exact p-value =0.592				
Sex								
Male	42 (60.9)	27 (39.1)	69 (100)	33 (52.4)	30 (47.6)	63 (100)	0.993	0.319
Female	42 (56.0)	33 (44.0)	75 (100)	38 (46.9)	43 (53.1)	81 (100)	1.784	0.182
	X^2= 0.351 p=0.554			X^2= 0.424 p=0.515				
Marital Status								
Single	42 (63.6)	24 (36.4)	66 (100)	35 (50)	35 (50)	70 (100)	2.422	0.119
Married	37 (59.7)	25 (40.3)	62 (100)	30 (51.7)	28 (48.3)	58 (100)	1.384	0.239
Separated/Divorced	0 (0.0)	3 (100)	3 (100)	1 (50)	1 (50)	2 (100)	0.400	0.400
Widowed	5 (38.5)	8 (61.5)	13 (100)	5 (35.7)	9 (64.3)	14 (100)	0.022	0.883
	Fischer's Exact p-value = 0.068			Fischer's Exact p-value = 0.757				
Family Type								
Monogamous	71 (63.6)	43 (36.4)	114 (100)	57 (51.4)	54 (48.6)	111 (100)	2.739	0.098
Polygamous	13 (41.4)	17 (58.6)	30 (100)	14 (42.4)	19 (57.6)	33 (100)	0.005	0.942
	X^2 = 3.51 p=0.061			X^2 = 0.811 p-value = 0.368				
Household Size								
≤4	30 (56.6)	23 (43.4)	53 (100)	33 (54.1)	28 (45.9)	61 (100)	0.326	0.568
>4	54 (59.3)	37 (40.7)	91 (100)	38 (45.8)	45 (54.2)	83 (100)	2.991	0.083
	X^2= 0.103 p= 0.748			X^2 = 0.973 p-value = 0.324				

** Fischer's Exact value

There was no statistically significant association in health-related quality of life global mean scores between HIV and HIV/TB co-infected respondents in each sub-group (p>0.05).

The proportion of HIV-only respondents with good QOL increased as age group increased from 25 to 54 years. Among the co-infected group, this followed no pattern. In both groups, majority of respondents with good QOL (60.9% and 52.4%) in HIV and HIV/TB groups respectively, were males while a higher proportion of respondents with poor QOL (44% and 53.1%) in HIV and HIV/TB groups respectively were women. This difference was not statistically significant (p>0.05).Similarly, majority of the respondents with good QOL (63.6% and 51.4%) in HIV and HIV/TB groups respectively were from monogamous families. This also was not statistically significant.

Table 11: Relationship between socio-economic variables and global score

Variables	HIV N=144 Global Score			HIV/TB N=144 Global Score				
	Good n (%)	Poor n (%)	Total n (%)	Good n (%)	Poor n (%)	Total n (%)	X^2	p-value
Level of Education								
No Formal	0 (0.00)	3 (100)	3 (100)	4 (44.4)	5 (55.6)	9 (100)	0.255	0.490*
Primary	6 (50.0)	6 (50.0)	12 (100)	5 (23.8)	16 (80.0)	21 (100)	0.085	0.119*
Secondary	31 (47.7)	34 (52.3)	65 (100)	34 (52.3)	31 (47.7)	65 (100)	0.202	0.653
Tertiary	47 (73.4)	17 (26.6)	64 (100)	28 (57.1)	21 (42.9)	49 (100)	3.291	0.069
	Fischer's exact p-value = **0.004**			Fischer's exact p-value =0.072				
Current Employment Status								
Employed	52 (61.9)	32 (38.1)	84 (100)	46 (53.5)	40 (46.5)	86 (100)	1.462	0.227
Unemployed	32 (53.3)	28 (46.7)	60 (100)	25 (43.1)	33 (56.9)	58 (100)	1.503	0.220
	$X^2 = 1.058$ p =0.304			$X^2 = 1.495$ p-value = 0.222				
Type of Employment								
Government	9 (75.0)	3 (25.0)	12 (100)	8 (61.5)	5 (38.5)	13 (100)	0.387	0.672*
Private Self	27 (54.0)	23 (46.0)	50 (100)	26 (48.2)	28 (51.9)	54 (100)	0.497	0.481
Private non-self	16 (72.7)	6 (27.3)	22 (100)	12 (63.2)	7 (36.8)	19 (100)	0.464	0.496
	Fischer's Exact p-value = 0.193			Fischer's Exact p-value = 0.434				
Occupation (Social Class)								
I – Professionals	12 (92.3)	1 (7.7)	13 (100)	6 (75.0)	2 (25.0)	8 (100)	0.316	0.531*
II – Other Professionals	11(61.1)	7 (38.9)	18 (100)	9 (60.0)	6 (40.0)	15 (100)	0.614	1.000*
III – Skilled workers	15 (65.2)	8 (34.8)	23 (100)	20 (64.5)	11 (35.5)	31 (100)	0.0005	0.982
IV – Semi skilled workers	20 (46.5)	23 (53.5)	43 (100)	19 (43.2)	25 (56.8)	44 (100)	0.171	0.679
V – Unskilled	26 (55.3)	21 (44.7)	47 (100)	17 (36.4)	29 (63.6)	46 (100)	3.153	0.076
	X^2 =8.852 Fischer's Exact p=0.053			Fischer's Exact p-value = 0.058				
Household Monthly Income		n=69						
≤30,000	7 (31.8)	15 (68.2)	22 (100)	6 (37.5)	10 (62.5)	16 (100)	0.133	0.715
30001-50000	6 (60.0)	4 (40.0)	10 (100)	11 (64.7)	6 (35.3)	17 (100)	0.563	1.000*
50001-100000	12 (80.0)	3 (20.0)	15 (100)	10 (58.8)	7 (41.2)	17 (100)	0.182	0.265*
>100000	18 (81.8)	4 (18.2)	22 (100)	5 (62.5)	3 (37.5)	8 (100)	0.261	0.344*
	X^2= 14.3 Fischer's Exact p-value= **0.0025**			Fischer's exact p-value = 0.41				

There was a statistically significant association between the level of education and QOL in respondents with HIV (p= 0.004). This difference in educational level was not significant among HIV/TB co-infected group. Among the HIV only group, respondents with no formal education had the highest proportion with poor QOL (100%), while respondents with primary education had a higher proportion with poor QOL among the HIV/TB co-infected (80%). There was no statistically significant association between level of education and QOL between the two groups. There was also statistically significant association between household income and QOL among HIV patients (p=0.0025). This difference in income was not significant among the HIV/TB co-infected group (p=0.41).Those who were employed had a higher proportion of respondents with good HRQOL when compared with the unemployed in both HIV (61.9%) and HIV/TB co-infected groups (53.5%). This was however, not statistically significant (p>0.05).

Table 12: Relationship between medical and lifestyle characteristics and global score

Variables	HIV N=144 Global Score			HIV/TB N=144 Global Score			X^2	p- value
	Good n (%)	Poor n (%)	Total n (%)	Good n (%)	Poor n (%)	Total n (%)		
Duration on ART								
≤ 2 years	33 (57.9)	24 (42.1)	57 (100)	23 (41.1)	33 (58.9)	56 (100)	3.198	0.074
>2 years	51 (58.6)	36 (41.4)	87 (100)	48 (54.6)	40 (45.5)	88 (100)	0.296	0.587
	$X^2 = 0.008$ p-value = 0.931			$X^2 = 2.486$ p-value =0.115				
Smoking Status								
Smokes	15 (65.2)	8 (34.8)	23 (100)	12 (40.0)	18 (60.0)	30 (100)	3.313	0.687
Does not smoke	69 (57.0)	52 (43.0)	121 (100)	59 (51.8)	55 (48.2)	114 (100)	0.940	0.332
	$X^2= 0.534$ p=0.465			$X^2 = 1.313$ p-value = 0.252				
Alcohol Consumption								
Drink Alcohol	25 (56.8)	19 (43.2)	44 (100)	33 (53.2)	29 (46.8)	62 (100)	0.077	0.782
Does not drink Alcohol	59 (59.0)	41 (41.0)	100 (100)	38 (46.4)	44 (53.7)	82 (100)	3.924	**0.047**
	$X^2 = 0.126$ p-value = 0.722			$X^2 = 0.669$ p-value = 0.413				
Exercise								
Yes	45 (62.5)	27 (37.5)	72 (100)	34 (54.0)	29 (46.0)	63 (100)	1.001	0.315
No	39 (54.2)	33 (45.8)	72 (100)	37 (45.7)	44 (54.3)	81 (100)	1.098	0.295
	$X^2 = 1.029$ p-value = 0.310			$X^2 = 0.974$ p-value = 0.324				

HIV respondents who do not drink alcohol had significantly higher proportion (p = 0.047) of respondents with good HRQOL (59%) than HIV/TB co-infected subject who also do not drink alcohol (46.4%). There was no significant association between the duration on ART, smoking status, exercise and the HRQOL of respondents in both groups (p>0.05).

Table 13: Comparison of mean demographic characteristics of respondents

Variable	HIV N=144 Mean (SD)	HIV/TB N=144 Mean (SD)	Students' t-test p-value
Age group (years)			
≤24	67.7 (11.9)	64.4 (14.7)	0.522
25 – 34	68.5 (13.5)	62.8 (15.0)	0.032
35 – 44	69.9 (11.7)	69.2 (13.1)	0.804
45 – 54	65.8 (13.7)	62.3 (15.9)	0.448
≥55	66.8 (16.9)	62.6 (8.8)	0.517
Sex			
Male	67.7 (14.1)	65.2 (15.7)	0.338
Female	68.8 (12.0)	64.4 (13.3)	**0.031**
Marital Status			
Single	67.9 (12.4)	65.3 (14.6)	0.269
Married	69.7 (13.6)	64.5 (14.8)	**0.042**
Separated/Divorced	50.8 (11.8)	65.6 (29.1)	0.462
Widowed	67.0 (11.2)	62.9 (10.0)	0.331
Household Size			
≤4	68.4 (12.8)	67.1 (14.8)	0.615
>4	68.2 (13.2)	63.0 (13.9)	**0.013**
Employment Status			
Employed	69.0 (12.8)	66.8 (13.3)	0.263
Unemployed	67.2 (13.3)	61.7 (15.4)	**0.040**
Duration of ART Treatment			
≤2	68.7 (11.5)	61.9 (14.5)	**0.007**
>2	67.9 (13.9)	66.5 (14.0)	0.499

The global mean scores were significantly higher in HIV only respondents among the Females (p=0.031) age group 25-34 (p=0.032), married (p=0.042), household size greater than four (p=0.013), unemployed (p=0.04) and in those on treatment for less than 2 years (p=0.007).

Table 14: Quality of Wellbeing Mean Scores of respondents

QWB Dimensions	HIV Mean ± SD	HIV/TB Mean ± SD	Student's t-test p-value
Average QWB	0.760 (0.19)	0.75 (0.20)	0.692
Day 1 CPX	0.216 (0.18)	0.22 (0.18)	0.179
Day 1 MOB	0.004 (0.02)	0.001 (0.009)	0.07
Day 1 PAC	0.008 (0.03)	0.013 (0.04)	0.160
Day 1 SAC	0.0031(0.02)	0.005 (0.02)	0.413
Day 2 CPX	0.198 (0.19)	0.218 (0.18)	0.352
Day 2 MOB	0.004 (0.01)	0.002 (0.12)	0.408
Day 2 PAC	0.008 (0.027)	0.014 (0.04)	0.156
Day 2 SAC	0.003 (0.014)	0.005 (0.02)	0.291
Day 3 CPX	0.209 (0.193)	0.227 (0.18)	0.408
Day 3 MOB	0.003 (0.014)	0.006 (0.03)	0.199
Day 3 PAC	0.010 (0.028)	0.015 (0.04)	0.147
Day 3 SAC	0.009 (0.067)	0.006 (0.02)	0.585

There was no significant difference in the Average quality of wellbeing scores of HIV (0.76) and HIV/TB co-infected patients (p=0.69).The mean scores were highest in the Acute and Chronic symptoms (CPX) section in all three days of the assessment in both HIV and co-infected patients. This translates to the respondents having the lowest quality of life scores in acute and chronic symptoms. There was no significant difference in Acute and Chronic Symptoms (CPX), Self care and mobility (MOB), Physical activity (PAC) and part 2 self care and Usual Activity (SAC) between HIV and HIV/TB co-infected patients.

Table 5: Distribution of Daily Quality of Wellbeing Scores of Respondents

| | HIV N=144 (%) | | HIV/TB N=144 (%) | | | |
	Good	Poor	Good	Poor	X^2	p-value
Overall QWB	67 (47.9)	73 (52.1)	65 (39.2)	87 (60.8)	2.177	0.140
Day 1 QWB	69 (47.9)	75 (52.1)	65 (45.1)	79 (54.9)	0.223	0.637
Day 2 QWB	63 (44.7)	78 (55.3)	58 (40.6)	85 (59.4)	0.493	0.483
Day 3 QWB	67 (47.9)	73 (52.1)	56 (39.2)	87 (60.8)	2.177	0.140

The mean score for overall Quality of Wellbeing was 0.760 for HIV only and 0.751 for HIV/TB co-infected groups. The distributions of the scores were not normally distributed so the median was used for cut-off for good and poor QWB.

Close to half (47.9%) of HIV and 39.2% of HIV/TB co-infected respondents had good wellbeing. This difference was however not statistically significant (p=0.140). There was no significant difference in the daily QWB scores between the two groups (p>0.005)

Table 16: Mean Score of Quality of Wellbeing Dimensions of respondents

HQOL Dimensions	HIV Mean ± SD	HIV/TB Mean ± SD	Students t-test p-value
Average QWB	0.760 ± 0.19	0.751 ± 0.20	0.692
Average CPX	0.208 ± 0.16	0.222 ± 0.17	0.439
Average MOB	0.003 ± 0.01	0.003 ± 0.01	0.914
Average PAC	0.009 ± 0.03	0.014 ± 0.04	0.137
Average SAC	0.005 ± 0.03	0.005 ± 0.018	0.936

The mean scores for QWB dimensions in descending order among the HIV only group were Acute and Chronic symptoms (CPX - 0.208 ± 0.16), Physical Activity (PAC- 0.009 ± 0.03), Part II Self care and Usual Activity (SAC- 0.005 ± 0.03), and Self care and Mobility (MOB -0.003 ± 0.01). The mean scores for QWB dimensions in descending order among HIV/TB co-infected respondents were Acute and Chronic symptoms (CPX-0.222 ± 0.16), Physical Activity (PAC-0.014 ± 0.04), Part II Self care and Usual Activity (SAC- 0.005 ± 0.018), Self care and Mobility (MOB -0.003 ± 0.01).

The mean scores between the two groups showed no statistically significant difference (p>0.05).

Table 17: Distribution of Quality of wellbeing dimensions of respondents

	HIV N =144		HIV/TB N=144		X²	p-value
	Good n (%)	Poor n (%)	Good n (%)	Poor n (%)		
Average QWB	79 (54.9)	65 (45.1)	65 (45.1)	79 (54.9)	2.722	0.099
Average CPX	78 (54.2)	66 (45.8)	66 (45.8)	78 (54.2)	2.000	0.157
Average MOB	125 (86.8)	19 (13.2)	132 (91.7)	12 (8.3)	1.771	0.183
Average PAC	127 (88.2)	17 (11.8)	120 (83.3)	24 (16.7)	1.394	0.238
Average SAC	132 (91.7)	12 (8.3)	128 (88.9)	16 (11.1)	0.633	0.426

The median scores for HIV only and HIV/TB co infected groups were the same for MOB (0.003) and SAC (0.995). Median scores for HIV only group in Average QWB, CPX and PAC were 0.718, 0.213 and 0.009 respectively. The median scores for the HIV/TB co-infected were 0.695, 0.297, and 0.014 for Average QWB, CPX and PAC respectively. The distribution of scores was skewed (Skewness was 0.75 and the kurtosis is 0.95. The standard error for the skewness is 0.26, the standard error for the kurtosis is 0.31. Both statistics are above two standard errors, which suggest that the data are not symmetric, and therefore not normally distributed) so the median was used as the cut off for good and poor QWB.

The proportion of respondents with good QWB in the HIV only group in descending order is Self care and Usual Activity (91.7%), Physical Activity (88.2%), Mobility (86.8%), Average QWB (54.9%) and Acute and Chronic symptoms (54.2%). The proportion of respondents with good QWB in the HIV/TB group in descending order is Mobility (91.7%), Self care and Usual Activity (88.9%), Physical Activity (83.3%), Acute and Chronic symptoms (45.8%) and Average QWB (45.1%). There was no statistically significant difference in proportion of respondents with good QWB between the two groups in all dimensions of wellbeing.

Table 18: Correlation of Average QWB Score on Dimensions of wellbeing score

Domain	HIV				HIV/TB			
	Constant (a)	Correlation coefficient (r)	Standard Error (SE)	p-value	Constant (a)	Correlation coefficient (r)	Standard Error (SE)	p-value
CPX	0.961	0.82	0.058	0.001	0.990	0.91	0.041	0.001
MOB	0.782	0.37	1.427	0.001	0.770	0.42	1.070	0.001
PAC	0.793	0.54	0.517	0.001	0.791	0.55	0.368	0.001
SAC	0.769	0.25	0.611	0.003	0.779	0.50	0.774	0.001

For HIV only group, Acute and Chronic symptoms (CPX) showed strong positive correlations with average quality of wellbeing (r = 0.82), Physical activity (PAC) showed moderate correlation (r = 0.54) with wellbeing score while Mobility (MOB) and Self Care and Usual Activity (SAC) showed weak correlation with wellbeing scores with r = 0.37 and 0.25 respectively.

For HIV/TB co-infected group, Acute and Chronic symptoms (CPX) showed strong positive correlations with average quality of wellbeing (r = 0.91), Physical activity (PAC) and Self Care and Usual Activity (SAC) showed moderate correlation (r = 0.55 and 0.50 respectively) with wellbeing score while Mobility (MOB) showed weak correlation (r=0.42) with wellbeing scores.

Table 19: Multiple Linear Regression of Average QWB Score on Dimensions of wellbeing score

Domain	HIV			HIV/TB		
	Regression coefficient (b)	Standard Error (SE)	p-value	Regression coefficient (b)	Standard Error (SE)	p-value
Constant (a)	0.995	0.014	0.000	0.987	0.008	0.001
CPX	- 0.855	0.058	**0.000**	- 0.961	0.030	**0.001**
MOB	- 0.790	0.943	0.404	- 1.037	0.409	**0.012**
PAC	- 1.345	0.405	**0.001**	- 0.921	0.224	**0.001**
SAC	- 0.864	0.354	**0.016**	- 1.153	0.460	**0.013**

For HIV only group, the CPX, PAC and SAC contributed significantly to the Average Quality of Wellbeing (p<0.05). The contribution of Mobility dimension (MOB) to the variation in average QWB was not statistically significant (p=0.404). With other variables held constant, the Acute and Chronic Symptoms (CPX) dimension contributed most to the variation in overall average wellbeing (b= - 0.855), followed by Self care and Usual Activity (b = - 0.864), and then Physical activity (b= -1.345).

For HIV/TB group, the CPX, MOB, PAC and SAC contributed significantly to the Average Quality of Wellbeing (p<0.05). With other variables held constant, the Physical Activity (PAC) dimension contributed most to the variation in overall average wellbeing (b = - 0.921), followed by the Acute and Chronic Symptoms (b = - 0.961), then Mobility (b =-1.037) and Self care and Usual Activity (b = -1.153).

CHAPTER FIVE

5.   DISCUSSION

The socio-demographic characteristics of the HIV/TB co-infected group were similar to that of HIV-only. The age and sex distribution of this study is similar to other studies which found HIV to be more among females and HIV/TB co-infection to be significantly associated with age and sex.[49,104] In these studies, co-infection was more among females than males with high proportion in the age range 21-60 years, while least in those above 60 years.[99] It therefore implies that HIV most likely affects young persons. This high proportion of female being infected is commonly referred to as feminization of HIV.[116]

Majority of the respondents were employed (mainly self employment) but more among respondents with HIV/TB co-infection, while unemployment was more among the HIV only group. Socio-economic class was determined on the basis of occupation. Over 60% of respondents in both groups were in the lower socioeconomic classes IV and V which comprised of semi-skilled, unskilled workers and the unemployed. The reported household monthly income in this study may be unreliable and likely to be underestimated because it is common knowledge in our environment, it is difficult to estimate income based on occupation because there are many undeclared sources of livelihood and our people are usually unwilling to declare the alternative sources.[117]

It is generally believed that anybody who is illiterate or educated below the secondary education level may not have adequate knowledge for protecting himself or herself from sexually transmitted diseases.[118] However, a significant proportion of patients in this study had secondary and tertiary education, and only few were illiterates. This is similar to findings in Kano Nigeria[119] and this suggests that higher educational levels may not offer protection against HIV

in our environment , contrary to what is obtainable in other climes. This is because the lifestyle and risk behaviours associated with HIV are not necessarily affected by educational level. Although the sample size was small to have adequate significance, a higher proportion of co-infected patients had smoked for fewer years than their HIV only counterparts. This may be due to a greater consciousness of the impact of cigarette smoke on their co-morbid status. However, co-infected patients consumed more alcohol than the HIV patients, as this association was significant. Majority of the respondents had a history of multiple sexual partners however this trend seem to be reversed in the recent past (2 months) as most of them had only one or no sexual partner in the two months prior to the study. It is likely that the patients understand the negative effects of multiple partners and possibility of STI infection on their disease status and have modified their lifestyle. Most of the sexually active patients had sexual intercourse with their legal spouses or lover, with a small proportion engaged in casual sex. This study however did not explore the reasons for the change in lifestyle or ascertain if the change was due to their disease status.

There are only four domains in the assessment of HRQOL – Physical health, Psychological health, Social relationship and Environmental health Domains. These domains are summed up to generate the global domain which represents the overall Quality of Life. The overall QOL mean score for HIV-only patients was much higher than what was obtained in North India[28], also a developing country, where the overall QOL mean score was found to be 25.8. The mean QOL scores for HIV only patients were highest in physical health and psychological health domains, respectively, with the lowest score in the environmental and social relationship domain. This is similar to findings in Kogi[89] and Ilorin[90] Nigeria among HIV patients, where the QOL highest mean scores were seen in psychological health and physical health, with the lowest score in the

social and environmental domain. In Ibadan, Nigeria[39] the highest mean QOL scores of HIV patients were in the psychological health, physical health, and the environmental domain, with the lowest score in the social domain.[39] The higher scores in the environmental domain in Ibadan, may be due to differences in access to health services, ease of transport and a lower standard of living in Ibadan. The social relationship domain in this study had the lowest proportion of respondents with good HRQOL. The social relationship domain assesses the patient's social contacts, family and friends support, and satisfaction with sexual activity. Therefore, lower scores in this domain may be due to stigma and discrimination associated with HIV, and this is similar to findings from other studies.[39,120] This finding however is in contrast to studies in India[28] and Sao Paulo, Brazil[91] where the highest mean scores were found in the social domain. This could be suggestive of a better societal support and care of PLWHA in these other developing countries.

The overall global mean score of HRQOL for HIV/TB co-infected patients was lower than in HIV-only patients in this study, but higher than HRQOL measured among co-infected patients in Ethiopia[111] and India[101].This may be due to the successful implementation of the National Tuberculosis and Leprosy Control Program in Nigeria, which offers a holistic care to patients with tuberculosis. The proportion of HIV/TB co-infected patients with good HRQOL was lowest in the physical and environmental domain and highest in the psychological domain (Table 7). The social relationship and environmental health was also reported to have the lowest mean scores among HIV/TB co-infected patients in this study. This is similar to findings in an Ethiopian study,[111] which reported lower mean scores for physical health, social relationship and environmental health among co-infected patients. The lower mean scores in the environmental

and social relationship domain may be suggestive of stigma and discrimination as well as poor living conditions among HIV/TB co-infected patients.

In comparing the HRQOL of the two groups in this study, the HIV positive patients had significantly higher proportion with good QOL than HIV/TB co-infected patients in the overall QOL, and physical and psychological QOL domains. This is similar to the study South-west Nigeria[95] which reported that participants with HIV/TB had significantly lower QOL in the physical and psychological domains when compared with PLWHA without TB. This is also in agreement with an Ethiopian study[111] which found that HIV/TB co-infected patients had a lower quality of life in the overall health when compared to HIV infected patients without active TB. This shows that TB has a negative impact on the HRQOL of HIV patients. This may be because TB patients are more likely to be depressed and less likely to have close partner support and sexual relationship. Depression and lack of family support have been found to be associated with poor QOL among co-infected patients.[111]

Majority of patients in both groups had good self-rated health and good satisfaction with health. (Table7). It is likely that the patients had a positive outlook to life and were coping well psychologically, as the psychological domain also had high scores in both groups. This may be as a result of frequent counseling received by PLWHA and co-infected patients under the elaborate HIV control programme. The HIV control strategy includes HIV Counselling and Testing with trained counselors. Clients receive pre and post test counseling, and in addition, counseling on the effects of diagnosis and treatment, quality and length of life, and positive living so they are better able to adjust psychologically and socially.[41] This is made possible because of the support funding from sponsors such as Family Health International (FHI-360) and Institute of Human Virology of Nigeria (IHVN).

All dimensions in this study showed skewed distribution (as evidenced on page 61) so the median was used (as mentioned in the methodology) in distinguishing good and poor HRQOL as well as good and poor QWB. The use of the median stems from its suitability in measuring central tendency in skewed distributions. Previous studies have also considered the use of the mean or median to represent HRQOL levels depending on the type of distribution.[111]

The HRQOL global domain which is an average of the physical, psychological, social and environmental domain was used to determine factors which affect HRQOL. The two groups were similar in the socio-demographic and socio-economic characteristics ie no statistically significant differences were observed between the two groups in their age, sex, marital status, ethnicity, family type, education, employment and income (Tables 1 and 2). With these factors stratified into sub-group and cross tabulated with Global HRQOL, the proportion of respondents with good HRQOL in the HIV group did not differ from those with HIV/TB co-infection for each socio-demographic characteristics sub-group (Table 10).

Various studies have been conducted to identify factors affecting quality of life. Some of the factors found to affect QOL in individuals with HIV/AIDS include sex,[31-33] educational and marital status,[34,35] CD4 counts[31,36-38] age group [36] and employment status[28]. Among patients with HIV/TB co-infection income, depression, lack of family support, level of education, perceived stigma, occupation, staging of disease were reported to be associated with QOL[93,111]

Among the HIV patients in this study, there appeared to be a decrease in the proportion of respondents with good quality of life as age increased from 25 to 54. No clear pattern was observed for age in the HIV/TB co-infected group. The lowest proportion of respondents with good HRQOL were observed in the older age group ≥ 55 years among the HIV only group and

among the younger age group (≤ 24 years) in the HIV/TB co-infected group. The mean score difference in age however showed a significant difference in QOL mean score among age group 25–35 years. HIV respondents in this age group had significantly higher mean scores (p=0.032) than co-infected patients of the same age group. Previous studies carried out in Nigeria[103,104] India[101] United States[102] and Nepal[121] have reported lower HRQOL with increasing age and better QOL among younger patients with HIV. These may be because young people have fewer responsibilities and tend to perceive most situations as good. This study however showed no significant difference in the proportion of respondents with good HRQOL between the TB and HIV/TB group within each age group.

Level of education (p=0.004) showed a significant association with HRQOL among the HIV patients with higher proportions of respondents with tertiary and secondary education having good quality of life compared to those in the lower educational level. This is similar to the findings of a study in Nigeria.[103,104] HIV patients who drink had a significantly higher proportion of respondents with good QOL when compared to the co-infected group. Other socio-demographic, socio-economic and life-style factors such as sexuality, smoking and exercise showed no statistically significant association with HRQOL in either group.

HIV respondents with more than four family members had significantly higher QOL mean score than those with less number of family members. A study among HIV patients in South Africa reported that while the increase in number of friends and family were to correlate with high social support, the study participants still had low scores for social functioning.[98] This emphasizes the importance of the supportive role of family members in improving the QOL of patients. A higher proportion of respondents in this study who were employed had good HRQOL when compared to those who are not employed. This is because being employed implies

receiving income and possibility of having basic needs like food, shelter and money for transport. This may also explain the increase in proportion with good HRQOL as household monthly income increased. Among those who were employed, higher proportions with good HRQOL were observed in those who were in government service and private (non-self) organizations compared to those who were self employed. This may be because they receive regular (monthly/weekly) salary and can plan themselves. Professionals (Social class I) had higher proportion with good HRQOL than other social classes in both groups while social classes IV and V had the lowest proportion of respondents with good HRQOL in both HIV and HIV/TB co-infected groups. This reasons for this is not far-fetched as lower socioeconomic class almost always translates to lower income and lower standards of living.

Household monthly income was observed to be associated with HRQOL among the HIV patients (p=0.0025), with the proportion of respondents with good HRQOL increasing as household monthly income increased. This is similar to a finding in a study in India which identified income as a factor affecting HRQOL in TB patients.[101] A study carried out in South east Nigeria reported that HIV/AIDS negatively impacts household income and expenditures[105] Previous studies carried out in India have reported duration or phase of treatment as a factor affecting HIV and TB patients[101,115,120] In this study, respondents who had been on anti-retroviral treatment for longer periods (more than two years) were observed to have a higher proportion with good HRQOL but this finding was not statistically significant (p>0.05). However the mean score among those who have been on treatment for not more than two years was significantly higher in the HIV group than the co-infected group.

The overall average wellbeing score for HIV and HIV/TB co-infected patients was high and similar. There was no statistically significant difference in wellbeing between the two groups.

There are four dimensions in the QWB-SA scale whish are Acute and Chronic Symptoms (CPX), Self care and Mobility (MOB), Physical Activity (PAC), Part 2 Self care and Usual Activity (SAC). Because the Quality of wellbeing scale is computed by subtracting the average score from 1, higher scores in the sub-sections therefore connote lower quality of wellbeing. In order words, there is an inverse relationship between dimensions of QWB scores and Average QWB. Respondents in both groups had the highest scores in the acute and chronic dimensions, (Table 14) and this means lower wellbeing scores in this dimension. This could be due to the fact that HIV and TB are debilitating diseases and are usually associated with diverse bodily symptoms. The Self care and Mobility (MOB) section had the lowest mean scores in the two group. This is indicative of adequate self care and minimal limitation of movement in PLWHA. There's no statistically significant difference between the wellbeing scores of the two groups.

The average QWB score was used to assess overall wellbeing among the respondents, scores below the median was graded as poor while scores above the median was classified as good QWB. The proportion of HIV respondents with good QWB was higher than the proportion of HIV/TB co-infected with good QWB; however this was not statistically significant. The highest proportion of HIV patients with good QWB was in the dimension of self care and Usual Activity (SAC) while the HIV/TB co-infected patients had the highest proportion with good QWB in the Part 2 Self Care and Mobility section. There was no statistically significant difference between the two groups in the four dimensions of Quality of wellbeing (p>0.05). Among the two groups, Acute and Chronic symptoms correlated strongly with Average quality of wellbeing (Tables 18). In the multiple regression model, Acute and chronic symptoms was found to be highest contributor to the overall wellbeing variation and the single greatest predictor of Average

wellbeing among HIV patients while Physical Activity contributed the highest to the overall QWB among the HIV/TB co-infection (Table 19).

The study hypothesis was that there was a significant difference in the HRQOL of patients with TB and HIV/TB in this treatment centre. A previous study comparing QOL in HIV and HIV/TB co-infected patients in Ethiopia reported lower scores in all domains of QOL in the HIV/TB group.[111] This study showed a statistically significant difference in the overall QOL and in the physical and psychological health domains, between HIV and HIV/TB co-infected patients.

The limitation of this study are the use of one hospital which does not make the result generalizable and therefore not representative of the QOL of HIV or HIV/TB patients in Rivers State. Another is the assessment of HRQOL and QWB-SA, which are subjective measures, and some respondents may overestimate or underestimate their QOL. The strength of this study lies in the use of validated 26-item WHOQOL-BREF assessment scale that covers a wide range of domains, which have been related to QOL and have been widely used in different countries including Nigeria to assess HRQOL, and the use of the QWB-SA that covers a wide range of dimensions, and a validated tool for measuring wellbeing. This study has added to the body of knowledge on the QOL of HIV and HIV/TB co-infected patients in Nigeria.

CONCLUSION

The HRQOL score of patients with HIV-only and HIV/TB co-infection was significantly different. More than half of the patients with HIV-only had good quality of life, while less than half of the co-infected patients had good quality of life.

The HIV/TB co-infected group had lower HRQOL mean scores compared to patients with HIV only. There was no significant relationship in QWB between the two groups. The study showed that educational level and household monthly income were factors significantly associated with HRQOL among HIV patients. Respondents with secondary level and above had higher HRQOL than those with primary level and below. Global QOL increased with increase in household monthly income. Both groups were identical in their socio-demographic and socio-economic characteristics and showed no significant difference between the groups when compared with the global mean scores.

This study showed a statistically significant difference in the overall health related quality of life as well as, in the physical and psychological aspects of health, between the HIV/TB and HIV-only patients. The HIV only group had a higher HRQOL compared to HIV/TB co-infected patients attending the Anti Retroviral Treatment Clinic of the University of Port Harcourt Teaching Hospital, Port-Harcourt, Rivers State.

RECOMMENDATIONS

1. Implication for policy and practice

    i) Attention should be paid to the overall health of HIV/TB co-infected patients with emphasis on the physical and psychological health. The TB Control program should design interventions to improve the health of co-infected patients with regards to reduction in pain and discomfort, dependence on substances, improvement of sleep and rest (as these constitute the physical health domain), as well as their psychological well-being which include improving the affect, self-concept, higher cognitive functions, body image and spirituality.

    ii) More attention should be given to the medical management of Acute and Chronic symptoms of PLWHA, as a little improvement in this area will go a long way in improving the overall wellbeing of both HIV-only and HIV/TB co-infected patients.

2. Implication for further research

    i.) Further research needs to be done among HIV and TB patients to further explore the issues surrounding physical health (that is) and psychological wellbeing (that is) and the challenges these patients face as it affects quality of life and with the view to address and further improve their lives.

    ii.) Another area of research that needs to be carried out is the link between quality of life and treatment adherence in HIV and TB patients. It would be good to know if there is an association between their quality of life and their risk of defaulting from treatment.

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APPENDIX I
CONSENT FORM FOR RESEARCH PROPOSAL

Title of Research Project: Comparative Study of Perceived Health Related Quality of Life among HIV patients with and without TB co-infection at the University of Port Harcourt Teaching Hospital, Port Harcourt.

Principal Investigator: Dr Kanu, Njideka Esther

What you should know about this study

a. You are being asked to join a research study

b. This consent form explains the research study and your part in the study

c. Please ask questions at any time about anything you do not understand

d. Ask any member of the study team to explain any words or information in this informed consent that you do not understand

Purpose of Research Project:

This study is aimed at measuring the health-related quality of life of HIV patients, and comparing with HIV/TB co-infected patients. Factors which affect the patient's quality of life will also be explored.

Procedures:

You will be required to answer some questions on the above-stated topic. This should take about 15-20 minutes of your time. Please try to be sincere, brief and clear as possible in your contributions.

Risk/Discomfort:

You may feel uncomfortable with divulging personal information or expressing your feelings on the certain aspects of your life and health status. There will be no needle pricks or bloodletting for any tests to be done.

Anticipated Benefits:

Your participation in this study will significantly improve the knowledge base on the quality of life of HIV patients, and factors that affect the quality of life. This may serve as baseline reference for policy formulation, program planning, implementation and evaluation towards improving the quality of life of HIV patients in Rivers state and in Nigeria.

Voluntary Participation:

You are a volunteer. You have the right to change your mind, or decide not to participate at any point during the course of the study. There will be no penalty or loss of benefit if you decide to quit the study. You should ask the research assistant or principal investigator any question you may have about this research study. During the study, we will tell you if we learn any new information that might affect whether you wish to continue to be in the study.

Who do I call if I have questions or problems?

a. Call the Principal investigator (Dr Kanu Njideka Esther), at 08036766669, if you have questions about the study or get sick as a result of being in this study

b. Call or contact University of Port-Harcourt Teaching Hospital Ethical committee, if you have questions about your right as a research participant or if you think you have not been treated fairly.

The committee contact information is: **Medical Research Ethics Committee, University of Port-Harcourt Teaching Hospital, Rivers State.**

What does your signature on this consent form mean?

Your signature on this form means:

a. You have been informed about this study's purpose, procedures, possible benefits and risks

b. You have received a copy of this consent

c. You have been given the chance to ask question before you sign

d. You have been told that you can ask any question at any time

e. You have voluntarily agreed to be in this study

f. You are free to stop being in this study at any time

g. If you stop being in this study, you understand it will not in any way affect your treatment at the ARV Clinic

h. You have agreed to co-operate with Dr Kanu Njideka Esther and the research staff and to tell them immediately, if you experience any unexpected or unusual symptoms.

Please indicate your name (participant): _____

Signature or Mark of Participant: _____ Date: _____

Signature of Person obtaining consent: _____ Date: _____

Witness to consent if participant is unable to read or write_____ Date _____

Signed Copies of this consent form must be:

1. Retained on a file by the principal investigator

2. Given to the subject. This consent document is NOT valid without the Ethical Committee stamp of approval.

APPENDIX II

QUESTIONNAIRE

A Comparative study of Perceived Health Related Quality of Life and Wellbeing of HIV patients with and without TB co-infection at University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria.

(Greet Respondent)

(Introduce Self)

This research project is about assessing your quality of life and factors affecting it. It was conceived based on some studies which have shown that HIV/AIDS and/or Tuberculosis has both positive and negative effects on an individual's wellbeing and quality of life, and that the addition of TB adversely affect Quality of Life.

Please answer each question as sincerely as you can, this will help us, the health care providers and other stakeholders appreciate how best to improve your care and support and thereby strengthen health services. The information you provide will be treated with utmost confidence.

If you agree to participate, please indicate by signing below.

Name & Signature…………………………….................. Date…………………………….

Section A: Demographic details

1. Age in years (as at last birthday)…………………….

2. Sex: (a) Male   (b) Female

3. Marital status: (a) Single (b) Married (c) Separated/Divorced (d)Widowed

4. Ethnic group: (a) Igbo (b) Ikwere (c) Ijaw (d) Yoruba (e) Hausa (f) Others (please specify)………..

5. Religion: (a) Christianity (b) Muslim (c) Traditional Religion (d) Others (pls specify)…………..

6. Family type: (a) monogamous   (b) polygamous

7. Household size: ……………

Section B: Socio-economic data

8. Highest level of education   (a) No formal education (b) Primary school (c) Secondary school (d) Tertiary

9. Are you currently employed? (a) Yes   (b) No

10. If yes to Q9, what is your employment status? (a) Government (b) Private self (c) Private non-self

11. Occupation: ………………...

12. Personal monthly income: …………………

13. Household monthly income: ……………….

14. How many people depend on this income? ……………

15. Do you own a house of your own? ....

16. How many rooms are in the house where you live: ………………

17. What is the average number of people sleeping in each room? ………………

18. How many people sleep in a room with respondent? ……………………….

19. Do you live within the LGA? (a) Yes (b) No (pls specify area)……………..

20. Do you work within the LGA? (a) Yes (b) No

21. What is your mode of transportation to clinic? (a) Private vehicle (b) Commercial vehicle (c) Commercial bus (d) Other………………..

22. If commercial vehicle/bus, how much does it cost you to come to the clinic? ....

Section C: Medical and Social History

23. For how long have you been on anti-retroviral treatment? ....

24. If co-infected, are you on anti kochs medication? (a) Yes   (b) No

25. Estimate the cost (loss to business/work) of having to attend clinic daily? ....

26. Have you at any time during treatment purchased anti-retroviral drugs on your own?

    (a)Yes   (b) No   (If No go to Q27)

27. If yes to Q24, how much did it cost to purchase the drugs? ....

28. Have you ever smoked cigarette, cigar?   (a) Yes   (b) No   (If No go to Q33)

29. If yes to Q27, are you currently smoking? (a) Yes   (b) No   (If No go to Q31)

30. For how many years have you been smoking? ....

31. What is the average number of sticks you smoke per day? ....

32. If No to Q28, How many years did you smoke? ....

33. What was the average number of sticks smoked per day? ....

34. Do you drink alcohol? (a) Yes (b) No (If No go to Q35)

35. If yes to Q33, what type of alcohol did you drink

(a) Beer, How many bottles? ……………or glasses……………per week

(b) Wine, How many bottles?....................or glasses…………...per week

(c) Gin, How many bottles? ……………or glasses……………per week

(d) Native brew, how many bottles? ……or glasses…………per week

(e) Others (pls specify)…........How many bottles?……or glasses……per week

36. Do you do any form of exercise? (a) Yes (b) No

37. If yes to Q34, What type of exercise? (pls specify)………………………..

38. How many (a) minutes……………. (b) hours………………per day

39. How many times a week? ……………………….

40. How many sexual partners have you had? …………

41. In the past two months, how many different partners have you had sex with? ………..

42. Is your most recent partner (a) A legal spouse (b)A lover (c) Co-worker (d) Casual date

(e) Commercial sex worker (f) Others specify…………

43. Do you or your sexual partner take alcohol before having sex? Yes ( ) No ( )

Section D: WHO Quality of Life (WHOQOL)-BREF assessment

(Read information below to respondent)

The following ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. **Please choose the answer that appears most appropriate.** If you are unsure, about which response to give to a question, the first response you think of is often the best one.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last four weeks**

		Very poor	Poor	Neither poor nor good	Good	Very good
1	How would you rate your quality of life?	1	2	3	4	5
		Very dissatisfied	dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2	How satisfied are you with your health?	1	2	3	4	5

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

3.	To what extent do you feel that physical pain prevents you from doing what you need to do?	5	4	3	2	1
4.	How much do you need any medical treatment to function in your daily life?	5	4	3	2	1
5.	How much do you enjoy life?	1	2	3	4	5
6.	To what extent do you feel your life to be meaningful?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	Extremely
7.	How well are you able to concentrate?	1	2	3	4	5
8.	How safe do you feel in your daily life?	1	2	3	4	5
9.	How healthy is your physical environment?	1	2	3	4	5

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

10.	Do you have enough energy for everyday life?	1	2	3	4	5
11.	Are you able to accept your bodily appearance?	1	2	3	4	5
12.	Have you enough money to meet your needs?	1	2	3	4	5
13.	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14.	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

		Very poor	Poor	Neither poor nor good	Good	Very good
15.	How well are you able to get around?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16.	How satisfied are you with your sleep?	1	2	3	4	5
17.	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18.	How satisfied are you with your capacity for work?	1	2	3	4	5
19.	How satisfied are you with yourself?	1	2	3	4	5
20.	How satisfied are you with your personal relationships?	1	2	3	4	5
21.	How satisfied are you with your sex life?	1	2	3	4	5
22.	How satisfied are you with the support you get from your friends?	1	2	3	4	5
23.	How satisfied are you with the conditions of your living place?	1	2	3	4	5
24.	How satisfied are you with your access to health services?	1	2	3	4	5
25.	How satisfied are you with your transport?	1	2	3	4	5

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

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

		Equations for computing domain score	Raw score	Transformed scores*	
				4-20	0-100
27.	**Domain 1**	(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18 □ + □ + □ + □ + □ + □ + □	a. =	b:	c:
28.	**Domain 2**	Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26) □ + □ + □ + □ + □ + □	a. =	b:	c:
29.	**Domain 3**	Q20 + Q21 + Q22 □ + □ + □	a. =	b:	c:
30.	**Domain 4**	Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25 □ + □ + □ + □ + □ + □ + □ + □	a. =	b:	c:

Section E: **Quality of Wellbeing (QWB) Scale**

The following ask about health problems you have experienced in the past 3 days, not including today

Part 1 Acute and Chronic illness	Yes	No
1. Please indicate whether you currently experience each of the following health symptoms or problems. *Do you have…*		
a. blindness or severely impaired vision in both eyes?		
Blindness or severely impaired in one eye?		
b. speech problems such as stuttering, or being unable to speak clearly?		
c. missing or paralyzed hands, feet, arms, or leg missing or paralysed fingers or toes?		
d. any deformity of the face, fingers, hand/arm, foot/leg, or back?		
e. general fatigue, tiredness. Or weakness?		
f. a problem with unwanted weight gain or weight loss?		
g. a problem with being under or over weight?		

h. problems chewing your food adequately?		
i. any hearing loss or deafness?		
j. any noticeable skin problems, such as bad acne or large burns or scars on face, body, arms, or legs?		
k. eczema or burning/itching rash?		
Which of the following aides do you use/have?	**Yes**	**No**
a. Dentures?		
b. oxygen tank?		
c. prosthesis?		
d. eye glasses or contact lenses?		
e. hearing aide?		
f. magnifying glass?		
g. neck, back, or leg brace?		

2. For the following list of problems indicate which days (If any) over the past 3 days, not including today, you had the problem. If you have not had the symptom in the past 3 days, do not leave the question blank, please fill in "no days." If you have experienced the symptom in the past 3 days, please check which of the days you had it; If you experienced it on more than one of the days, fill In all days that apply.

2. Did you have.. (please fill In all days that apply)	No Days	Yester day	2 days ago	3 days ago
a. any problems with your vision not corrected with glasses or contact lenses (such as double vision, distorted vision, flashes, or				

floaters)?				
b. any eye pain, irritation, discharge, or excessive sensitivity to light?				
c. a headache?				
d. dizziness. earache, or ringing in your ears?				
e. difficulty hearing, or discharge, or bleeding from an ear?				
f. stuffy or runny nose, or bleeding from the nose?				
g. a sore throat, difficulty swallowing, or hoarse voice?				
h. a tooth ache or jaw pain?				
i. sore or bleeding lips, tongue, or gums?				
j. coughing or wheezing?				
k. shortness of breath or difficulty breathing?				
l. chest pain, pressure, palpitations, fast or skipped heart beat, or other discomfort in the chest?				
m. an upset stomach. abdominal pain, nausea, heartburn, or vomiting?				
n. difficulty with bowel movements, diarrhea, constipation, rectal bleeding, black tar-like stools, or any pain or discomfort in the rectal area?				
o. pain, burning, or blood in urine?				
p. loss of bladder control, frequent night-time urination, or difficulty with urination?				

q. genital pain, itching, burning or abnormal discharge, or pelvic cramping or abnormal bleeding? (does not include normal menstruation)				
r. a broken arm, wrist, foot, leg, or any other broken bone (other than in the back)?				
s. pain, stiffness, cramps, weakness, or numbness in the neck or back?				
t. pain, stiffness, cramps, weakness, or numbness in the hips or sides?				
u. pain, stiffness, cramps, weakness, or numbness in any of the joints or muscles of the hand, feet, arms, or legs?				
v. swelling of ankles, hands, feet or abdomen?				
w. fever, chills, or sweats?				
x. loss of consciousness, fainting, or seizures?				
y. difficulty with your balance, standing. or walking?				
3. The following symptoms are about your feelings, thoughts, and behaviors. Please fill In which days (If any) over the past 3 days, not Including today, you have had ...				
a. trouble falling asleep or staying asleep?				
b. spells of feeling nervous or shaky?				
c. spells of feeling upset, downhearted, or blue?				
d. excessive worry or anxiety?				
e. feelings that you had little or no control over events in your life?				

f. feelings of being lonely or isolated?				
g. feeling of frustration, irritation, or close to losing your temper?				
h. a hangover?				
i. any decrease of sexual interest or performance?				
j. confusion, difficulty understanding the written or spoken word, or significant memory loss?				
k. thoughts or images you could not get out of your mind?				
I. to take any medication including over-the-counter remedies (aspirin/tylenol, allergy medications, insulin, hormones, estrogen, thyroid, prednisone)?				
m. to stay on a medically prescribed diet for health reasons?				
n. a loss of appetite or over-eating?				
4. In the last 3 days did you have any symptoms, health complaints, or pains that have not been mentioned? Yes O No O If yes, what were they and on which days did you have them?				
Symptom A:_____				
Symptom B:_____				
Part II - Self Care **5. Over the last 3 days ... (please fill In all days that apply)**				
a. did you spend any part of the day or night as a patient in a				

hospital, nursing home, or rehabilitation center?				
b. because of any impairment or health problem, did you need help with your personal care needs, such as eating, dressing, bathing, or getting around your home?				

Part III – Mobility

6. Over the last 3 days ... (please fill In all days that apply)

a. which days did you drive a motor vehicle?				
b. which days did you use public transportation such as a bus, taxi, or airplane?				
c. which days did you either not drive a motor vehicle or not use public transportation because of your health, or need help from another person to use?				

Part IV - Physical Activity

7. Over the last 3 days did you ... (please fill in all days that apply)

a. have trouble climbing stairs or inclines or walking off the curb				
b. avoid walking, have trouble walking, or walk more slowly than other people your age?				
c. limp or use a cane, crutches, or walker?				
d. avo1d or have trouble bending over, stooping, or kneeling?				
e. have any trouble lifting or carrying everyday objects such as books, a briefcase, or groceries?				

f. have any other limitations in physical movements?				
g. spend all or most of the day in a bed, chair, or couch because of health reasons?				
h. spend all or most of the day in a wheelchair?				
i. If In a wheelchair, on which days did someone else control its movement?				
Part V Usual Activity **8. Over the past 3 days ... (please fill in all days that apply)**				
a. because of any physical or emotional health reasons, on which days did you avoid, need help with, or were limited in doing some of your usual activities, such as work, school or housekeeping?				
b. because of any physical or emotional health reasons, on which days did you avoid or feel limited in doing some of your usual activities, such as visiting family or friends, hobbies, shopping, recreational, or religious activities?				
c. on which days did you have to change any of your plans or activities because of your health? (Consider only activities that you did not report in the last 2 questions)				

If limited, please describe: ……………………………………………………………

9a. Would you say that your health is: Excellent ( )   Very Good ( )   Good ( )   Fair ( )

b. Compared to a year ago, how would you rate your health in general now?

( )   Much better than a year ago

( )   Somewhat better than one year ago

( )   About the same as a year ago

( )   Somewhat worse than a year ago

( )   Much worse than a year ago

( )   Poor

c. Think about a scale of 0 to 1 00, with zero being the least desirable state of health that you could imagine and 100 being perfect health. What number, from 0 to 1 00 would

you give to the state of your health, on average, over the last 3 days? 0 ( ), 10 ( ), 20 ( ), 30 ( ), 40 ( ), 50 ( ), 60 ( ), 70 ( ), 80 ( ), 90 ( ), 100 (u).

APPENDIX III
Scoring Algorithm

QWB–SA

Part I - Acute and Chronic Symptoms

1. Please indicate whether you currently experience any of the following health symptoms or problems. Do you have...

a. blindness or severely impaired vision in both eyes? (.523)

blindness or severely impaired vision in only one eye? (.358)

b. speech problems such as stuttering or being unable to speak clearly? (.358)

c. missing or paralyzed hands, feet, arms, or legs? (.423)

d. missing or paralyzed fingers or toes? (.297)

e. any deformity of the face, fingers, hand or arm, foot or leg, or back (e.g. severe scoliosis)? (.408)

f. general fatigue, tiredness, or weakness? (.256)

g. a problem with unwanted weight gain or weight loss? (.233)

h. a problem with being under or over weight? (.225)

i. problems chewing your food adequately? (.204)

j. any hearing loss or deafness? (.274)

k. any noticeable skin problems, such as bad acne or large burns or scars on

l. face, body, arms, or legs? (.187)

m. eczema or burning/itching rash? (.187) ・・

Which of the following health aides do you use/have?

Dentures (.153) ・・

oxygen tank (no wt.) ・・

prosthesis (no wt.) ・ ・

eye glasses or contact lenses? (.066) ・ ・

hearing aide? (.148) ・ ・

magnifying glass? (no wt.) ・ ・

neck, back, or leg brace? (no wt.) ・ ・

2. For the following list of problems indicate which days (if any) over the past 3 days, not including today, you had the problem. If you have not had the symptom in the past 3 days, do not just leave the question blank, please check "No Days." If you have experienced the symptom in the past three days, please check which of the days you had it; if you experienced it on more than one of the days, please check all days that apply.

Did you have.... (Please Check All Days That Apply)

a. Any problem with your vision not corrected with glasses or contact lenses (such as double vision, distorted vision, flashes, or floaters)? (.293)

b. any eye pain, irritation, discharge, or excessive sensitivity to light? (.389)

c. a headache? (.189)

d. dizziness, earache, or ringing in your ears? (.299)

e. difficulty hearing, or discharge, or bleeding from an ear? (.350)

f. stuffy or runny nose, or bleeding from the nose? (.178)

g. a sore throat, difficulty swallowing, or hoarse voice? (.204)

h. a tooth ache or jaw pain? (.298)

i. sore or bleeding lips, tongue, or gums? (.271)

j. coughing or wheezing? (.386)

k. shortness of breath or difficulty breathing? (.208)

l. chest pain, pressure, palpitations, fast or skipped heartbeat, or other discomfort in the chest? (.343)

m. an upset stomach, abdominal pain, nausea, heartburn, or vomiting? (.260)

n. difficulty with bowel movements, diarrhea, constipation, rectal bleeding, black tar-like stools, or any pain or discomfort in the rectal area?(.278)

o. pain, burning, or blood in urine? (.428)

p. loss of bladder control, frequent night-time urination, or difficulty with urination?(.259)

q. genital pain, itching, burning or abnormal discharge, or pelvic cramping or abnormal bleeding? (does not include normal menstruation) (.369)

r. a broken arm, wrist, foot, leg, or any other broken bone (other than in the back)? (.365)

s. pain, stiffness, cramps, weakness, or numbness in the neck or back? (.318)

t. pain, stiffness, cramps, weakness, or numbness in the hips or sides? (.365)

u. pain, stiffness, cramps, weakness, or numbness in any of the joints or muscles of the hand, feet, arms, or legs? (.318)

v. swelling of ankles, hands, feet or abdomen? (.306)

w. fever, chills, or sweats? (.320)

x. loss of consciousness, fainting, or seizures? (.517)

y. difficulty with your balance, standing. or walking? (.377)

3. The following symptoms are about your feelings, thoughts, and behaviors. Please fill in which days (If any) over the past 3 days, not Including today, you have had...

a. trouble falling asleep or staying asleep? (.296)

b. spells of feeling nervous or shaky? (.286)

c. spells of feeling upset, downhearted, or blue? (.327)

d. excessive worry or anxiety? (.324)

e. feelings that you had little or no control over events in your life? (.430)

f. feelings of being lonely or isolated? (.311)

g. feeling of frustration, irritation, or close to losing your temper? (.378)

h. a hangover? (.297)

i. any decrease of sexual interest or performance? (.307)

j. confusion, difficulty understanding the written or spoken word, or significant memory loss? (.559)

k. thoughts or images you could not get out of your mind? (.255)

I. to take any medication including over-the-counter remedies (aspirin/ tylenol, allergy, medications, insulin, hormones, estrogen, thyroid, prednisone)? (.160)

m. to stay on a medically prescribed diet for health reasons? (.201)

n. a loss of appetite or over-eating? (.223)

Part II - Self Care. Over the last 3 days ... (please fill In all days that apply)

a.did you spend any part of the day or night as a patient in a hospital, nursing home, or rehabilitation center? (.089)

b. because of any impairment or health problem, did you need help with your personal care needs, such as eating, dressing, bathing, or getting around your home? (.096)

Part III – Mobility

a. which days did you drive a motor vehicle? 0

b. which days did you use public transportation such as a bus, taxi, or airplane? 0

c. which days did you either not drive a motor vehicle or not use public transportation because of your health, or need help from another person to use? (.031)

Part IV - Physical Activity

a. have trouble climbing stairs or inclines or walking off the curb (.072)

b. avoid walking, have trouble walking, or walk more slowly than other people your age? (.072)

c. limp or use a cane, crutches, or walker?(.072)

d. avoid or have trouble bending over, stooping, or kneeling? (.072)

e. have any trouble lifting or carrying everyday objects such as books, a briefcase, or groceries? (.072)

f. have any other limitations in physical movements? (.072)

g. spend all or most of the day in a bed, chair, or couch because of health reasons? (.163)

h. spend all or most of the day in a wheelchair?(.102)

i. If In a wheelchair, on which days did someone else control its movement? (.163)

Part V – Usual Activity

  a. because of any physical or emotional health reasons, on which days did you avoid, need help with, or were limited in doing some of your usual activities, such as work, school or housekeeping? (.054)

  b. because of any physical or emotional health reasons, on which days did you avoid or feel limited in doing some of your usual activities, such as visiting family or friends, hobbies, shopping, recreational, or religious activities? (.054)

  c. on which days did you have to change any of your plans or activities because of your health? (Consider only activities that you did not report in the last 2 questions)(.054)

Scorer

1 – (CPXwt) – (MOBwt) – (PACwt) – (SACwt)

DAY		CPX		MOB		PAC		SAC		DAILY QWB
3	Score = 1-	( )	-	( )	-	( )	-	( )	=	_____
2	Score = 1	( )	-	( )	-	( )	-	( )	=	_____
1	Score = 1	( )	-	( )	-	( )	-	( )	=	_____

Total Score _____

Total Score _____ / 3 Days = Average Self-Administered QWB Score _____