

UNIVERSITY OF WESTERN CAPE

FACULTY OF COMMUNITY AND HEALTH SCIENCES

PHYSIOTHERAPY DEPARTMENT

**PHYSICAL ACTIVITY LEVELS AMONG PEOPLE LIVING WITH HIV/AIDS
TREATED WITH HIGH ACTIVE ANTIRETROVIRAL THERAPY IN RWANDA.**

BY

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**A thesis to be submitted to the faculty of community and health sciences of the
University of Western Cape, in partial fulfillment of the requirements for Masters
Degree in Physiotherapy science.**

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DECLARATION

I hereby declare that ‘**Levels of physical activity participation among people living with HIV/AIDS treated with HAART in Kigali, Rwanda**’ is my own work, that it has not been submitted for any degree or examination at any other University, and that all the resources used or quoted have been indicated and acknowledged by complete references.

Murenzi Augustin

Signature.....

May 2011

Witness:

Prof. José Merle Frantz

DEDICATION

I dedicate this thesis to God, my Heavenly Father, for granting me the strength. Also to my lovely parents Mukarwiru Marie and the late Munyeshuri Tharcisse for their unconditional love and encouragement during my studies.

Finally, I dedicate this thesis to my brother Mutaganzwa and his family, my sister Mukansoro and her family and my fiancé Kayisenge H.

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ABSTRACT

The use of high active antiretroviral therapy in people living with HIV/AIDS is increasing worldwide. In Rwanda, above 70 % of people in need of antiretroviral therapies is getting them. This drug therapy is associated with abnormal fat redistribution and metabolic complications which increase the risks of cardiovascular and diabetes diseases among these patients. The best recommended preventive and treating modality for these complications is physical activity participation. Despite this recommendation, there is lack of information about physical activity in HIV individuals under high active antiretroviral therapy. The current study aims to determine physical activity levels among people living with HIV treated with high active antiretroviral therapy in Kigali, Rwanda. A cross-sectional design using quantitative method was used. The participant's levels of physical activity participation and their association with anthropometric profiles were measured, using a structured self-administered questionnaire adapted from the Sub-Saharan Africa Activity Questionnaire. Based on a scientific calculation, 407 clients passing through the clinics were included in the study. A convenient sample of people attending the clinics approached to participate voluntarily in the study. The statistical package for social sciences version 19.0 and descriptive statistics were used to analyze the data. Inferential statistics like Chi-square test was used to determine the associations between physical activity levels and anthropometric profiles ($p < 0.05$). Of the participants, 77% were female with a mean age of 38.82 years ($SD=8.9$). According to body mass index and weight hip ration, approximately 40% and 43% were obese and overweight respectively. Obesity was more common amongst the females (45%). The study found a high prevalence of inactivity in the following activities, of leisure-time (82.6%), household (71%), walking to/from work (61.7%) and work related physical activities (75%). Obesity was found to be strongly associated with inactivity in all types of activity. The findings of the current study highlighted the lack of motivation, lack of time and

fear of worsening the disease amongst the strong barriers to physical activity participation. The current study recommends education about the benefits of physical activity participation and encouragement of patient treated with high active antiretroviral therapy in Rwanda to be emphasized on to improve their lives.

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CHAPTER ONE: INTRODUCTION

1.1. INTRODUCTION

This chapter includes the general overview of HIV/AIDS worldwide, including its situation in Rwanda. Furthermore the prevalence of people living with HIV/AIDS treated with HAART is highlighted. The impact of HAART on the human body is discussed including the importance of different physical activities on the harmful effects of that therapy. The aim, specific objectives and the statement of the problem are also highlighted. Finally, the significance of the study, definition of key terms and abbreviations used in this study are presented.

1.2. BACKGROUND

Globally people living with Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) accounted for approximately 33.4 million in 2008 (WHO, 2010). Among those people living with HIV/AIDS, adults accounted for about 31.3 million and children for 2.1 million. HIV/AIDS has therefore become a pandemic with more than 2.7 million newly infected cases. Two million people have died as a result of HIV/AIDS in 2008 (Global Health Council, 2010). Furthermore, 3 million each year and 6800 people each day are estimated to be infected by the virus respectively (WHO, 2010).

In developed countries, people living with HIV/AIDS are living longer due to accessibility treatment, increasing the prevalence rate of them (USAIDS, 2009). Developing countries are heavily affected by HIV infection with a rate of 90% of all people living with HIV in the

world (Global Health Council, 2010). In North America approximately 1.4 million people are living with HIV, 850 000 are in Western and Central Europe (UNAIDS, 2009).

Sub-Saharan African countries are mostly affected by HIV infection. 70% (22.4 million) of all people living with HIV worldwide are found in this area. In addition, this region has only 10% of the world's population (USAID, 2009). Even though the number of new infections is continuously decreasing, it was estimated that 1.9 million of people were newly infected with HIV in Sub-Saharan Africa in 2008 (USAID, 2009). In Rwanda, one of the Sub-Saharan countries, HIV infection was first diagnosed in 1983. Just after three years, the rate of people infected by HIV was approximately 17.8% among urban populations and 1.3% among rural populations (CNLS Rwanda, 2007). It was classified amongst the first ten African countries that are mostly infected with HIV/AIDS (CNLS Rwanda, 2007). This might be influenced by the genocide of 1994 where many women were raped, sexually tortured and psychologically traumatized (CNLS Rwanda, 2007).

Prevalence data from Rwanda after the genocide, reported people infected with HIV to be approximately 27% among the urban population, 13% among semi-urban population and 6.9% among the rural population (USAID, 2009). In 2007, the survey that was done by CNLS showed that there was a significant decrease in the prevalence among the urban (7%) than rural areas (2.3%) (CNLS Rwanda, 2007). The survey further revealed that women are more infected (57.6%) than men (53.6%) (CNLS Rwanda, 2007). The following studies reported that the estimation of people living with HIV/AIDS in Rwanda accounted for about 3.1 % among adults aged 15 to 49 years (U.S Department of State, 2008).

After the identification of HIV/AIDS in 1981 worldwide, a lot of initiatives were started to try and discover a treatment and prevention. In 1996, scientific researchers discovered that the effective treatment of HIV infection needs to be a combination (regimen) of three or more

anti-HIV (US department, 2008; Perterson et al., 2000). This combination is known by the name of High Active Antiretroviral Therapy (HAART) from at least two different classes (Anti-HIV medications fall into six classes). The accessibility of HAART is increasing gradually worldwide since the end of 2008. People on HAART accounted approximately 4 million worldwide and 2.9 millions of them in Sub-Saharan (WHO, 2010).

Rwanda is one of the countries sponsored by the President's Emergency Plan for AIDS Relief (PEPFAR). These countries represent approximately 50% of HIV infections worldwide (USAID, 2009). This donation assisted in increasing accessibility of Rwandan HIV patients to HAART. In Rwanda, more than 70% of people in need of antiretroviral therapies (HAART) have been treated with them (USAID, 2009).

The use of HAART assists in improving the longevity of life of people affected by HIV/AIDS. It reduces the severity of the virus. It is not a cure (Centre for Disease Control and Prevention, 2003). It is expected that many HIV sero-positive Americans can live full and productive lives for decades (GNP, 2009). The recent researchers revealed that the use of HAART is significantly associated with very harmful changes known as morphologic and metabolic changes (Vergara-Rogriguez, Vibhakar & Watts, 2009). After this approval, to avoid the development of these changes, it was recommended that the prescription of HAART should be given in combination regimen. Several recent scientific researchers revealed that, whichever combination is used, there are adverse effects (Vergara-Rogriguez et al., 2009). Actually, these morphological and metabolic changes appeared to be 12- 20 months after initiation of HAART (Saves et al., 2002).

These metabolic and morphologic adverse effects mostly resulted in gastro-intestinal, neurologic, metabolic and cardiovascular dysfunctions. Renal, dermatological and hematological events may also be present (Schiller, 2004). According to Barbaro (2006) and

Grinspoon (2005), the metabolic and cardiovascular dysfunctions, increased insulin resistance and lipodystrophy are very dangerous side effects. They increase risks of cardiovascular diseases and type 2 diabetic mellitus. Moreover, these complications are due to the HAART or direct effects of HIV infection (Batterham, Garsia, & Greenop, 2000).

Furthermore, the presence of obesity, dietary imbalances as well as sedentary lifestyles aggravates these metabolic disturbances (Shah, Tierney & Adams-Huet, 2005). Obesity has been identified as a key risk factor for coronary heart diseases and type 2 diabetes mellitus (27% and 6-21% respectively) correlated with physical inactivity and sedentary life of people living with HIV/AIDS under HAART (Amorosa et al., 2005).

Previously, the controls of these adverse effects have included temporally interruptions in treatment, therapeutic drug monitoring and careful surveillance of complex drug regimens. This was likely to result in the development of resistance, as well as a loss of efficacy use and future treatment options (Schiller, 2004). Recently, physical activity participation has been reported to be the best way to prevent and manage these adverse effects of HAART (Amorosa et al., 2005; Aberg, 2003)

The studies revealed that increased physical activity participation is the best appropriate management for cardiovascular disease, lipodystrophy and glucose or lipid metabolism complications in HIV/AIDS patients treated with HAART (Terry et al., 2006; Malita, Karelis, Toma & Rabasa-Lhoret, 2005). Several other studies conducted have reported that the benefits of physical activities/exercises in people living with HIV/AIDS treated with HAART include the mprovement of their quality of life and well-being (Mutimura, Stewart, Crowther, Yarasheski & Cade, 2008), strength (Roubenoff & Wilson, 2001), and increasing functional work capacity (Hand et al., 2007). The other benefits indicated are psychological effects (Roubenoff, 2000) and self-efficacy (Fillipas, Oldmeadow, Bailey & Cherry, 2007). Also, physical fitness and ability to perform daily living activities or improvement of body's

ability to fight infection or a slower progression of HIV to AIDS found to be the benefits of physical exercises (Robinsoni, Quinn & Rimmer, 2007; Bopp, Phillipas, Fulk & Hand, 2003).

Very few studies have been done in Sub-Saharan Africa about effects of physical activities among HIV persons. The study conducted in Sub-Saharan region particularly in Rwanda by Mutimura et al. (2008) confirmed the positive effects of physical activities/exercises among HIV infected people treated with HAART especially on metabolic & cardiovascular related risks. Despite the well-indicated benefits of physical activities for persons living with HIV/AIDS, different studies on different groups indicated that these people do not engage adequately in physical activities (Clingerman, 2004; Farah, Barbara, Nelson & Jorge, 2004). These studies have been done in developed countries.

According to World Bank report, physical activity needs to be promoted in all domains and over the world as the levels of inactivity are high in all developed and developing countries. Furthermore, about 56% of all deaths in developing countries may be attributed to non-communicable diseases (Adeyi, Smith & Robles, 2007). The WHO estimates that by 2020, 80% of deaths from common non-communicable diseases may occur in low- and middle-income countries (WHO, 2006). Therefore, non-communicable diseases associated with physical inactivity are significant public health problems in most countries around the world. In developed countries more than half of adults are insufficiently active (WHO, 2006). Furthermore, in rapidly growing large cities of the developing world, including Kigali physical inactivity is an even greater problem. With the increase of HIV/AIDS, more people, particular HIV patients are increasingly involved in less physical activity. Therefore they need to be encouraged to participate in physical activities as it was reported that HIV patients are not motivated to participate in physical activities/ exercises (Buchholz & Purath, 2007).

In Rwanda, several studies about levels of physical activity have been conducted on different individuals, i.e. the employees of one University (Banyangiriki, 2009), on adults living with

diabetes mellitus (Kabanda & Phillips, 2008), students in Universities (Tumusiime & Frantz, 2006), women working in high-income institutions (Kagwiza, Philips & Struchers, 2005). All of these studies indicated that the majority of their participants were physically inactive. This made them to be at risk of developing non-communicable diseases such cardiovascular and diabetes mellitus. This might be the same in people living with HIV/AIDS, treated with HAART.

Currently, there is no available information about physical activity levels among HIV individuals in Sub-Saharan Africa. No study has been conducted in Rwanda about the physical activity levels among people living with HIV treated with HAART. The accessibility of HAART for Rwandan HIV patients is increasing. It is well known that this therapy is associated with very serious adverse effects such as metabolic and morphologic changes. These adverse effects put these people at high risk of being affected with cardiovascular and diabetic diseases.

These adverse effects can be prevented and treated by engaging in regular physical activities. However, according to Rwandan literature, levels of physical activity participation in this population are lacking. It is for this reason that the investigator decided to conduct a study on levels of physical activity among people living with HIV/AIDS and treated with HAART in Rwanda. It aimed to find out the extent and types of physical activities they are involved in. Furthermore, this recent information may be a useful tool in the implementation of promotion strategies aiming at the prevention and appropriate management of people living with HIV/AIDS treated with HAART and those at risk of developing cardiovascular and diabetic diseases.

1.3. PROBLEM STATEMENT

The use of HAART is associated with very serious complications. These include morphologic and metabolic changes, resulting in cardiovascular and diabetes diseases. The regular physical activity had been proved to be a sufficient arm to fight and minimize these complications. However, the Rwandan people living with HIV/AIDS treated with HAART were not encouraged to participate into physical activity/exercises while the accessibility of HIV medicines increases in Rwanda. Furthermore, the extent to which physical activities are done by Rwandan people living with HIV/AIDS treated with HAART is not well known.

1.4. RESEARCH QUESTION

Are people living with HIV and treated with HAART engaging in physical activity?

1.5. AIM OF THE STUDY

The aim of the study was to determine the physical activity levels among people living with HIV/AIDS treated with HAART in Rwanda.

1.6. STUDY OBJECTIVES

1. To determine the levels and types of physical activities among people living with HIV/AIDS treated with HAART, in Rwanda
2. To identify the anthropometric profiles associated with physical inactivity among people living with HIV/AIDS, treated with HAART, in Rwanda
3. To determine factors contributing to physical inactivity among people living with HIV/AIDS treated with HAART, in Rwanda.

1.7. SIGNIFICANCE OF THE STUDY

Based on how patients with HIV/AIDS live longer with chronic and debilitating illness and their vulnerability to cardiovascular and diabetes disease due to HAART, physical activity participation needs to be promoted, particularly for these patients. Thus, the results of this study will refresh knowledge of people living with HIV/AIDS, treated with HAART, about the benefits and awareness of physical activities in general. They will also be updated about the adequate level and types of physical activities. Finally, the results of this study will also contribute to improve the quality of their lives by clearly indicating the risks they will face physical activity is not included daily.

1.8. DEFINITION OF KEY TERMS

Physical activity: is defined as any bodily movement that is produced by the contraction of skeletal muscles and that substantially increases energy expenditure (Miles, 2007). This term therefore includes the full range of human movement from competitive sport and exercise to hobbies or activities involved in daily living.

Physical inactivity/sedentary: is described as a state in which bodily movement is minimal and energy expenditure approximates the resting metabolic rate (IARC, 2002).

Exercise: is defined as a physical activity that is planned, structured and repetitive bodily movements that are performed with the purpose of improving or maintain one or more components of physical fitness. General physical fitness include strength, endurance and flexibility (Hardman & Stensel, 2003).

HIV: Human Immunodeficiency Syndrome is a human retrovirus that attacks and destroys the disease-fighting cells of the immune system, leaving the body with a weakened defense

against infections and cancer. That is why it is believed to be the causative organism of Acquired Immunodeficiency Syndrome (AIDS) (Griffen, 2003).

Acquired Immunodeficiency Syndrome (AIDS): is the most serious stage of HIV infection. It results from the destruction of the infected person's immune system (U.S. Department of Health and Human Services, 2009).

Cluster of differentiation 4 (CD4 cells): are a type of white blood cell that fights infections. They are also called CD4+ T cells or CD4 T lymphocytes. A CD4 count is the number of CD4 cells in a sample of blood (U.S. Department of Health and Human Services, 2009).

High Active Antiretroviral Therapy (HAART): is the recommended treatment for HIV that is prescribed in a combination (regimen) of three or more anti-HIV (also called antiretroviral) medications from at least two different classes (anti-HIV fall into six classes) (U.S. Department of Health and Human Services, 2009).

Cardiovascular diseases: These are the diseases which are caused by disorders of the heart and blood vessels, and include coronary heart (heart attacks), cerebrovascular disease (stroke), raised blood pressure (hypertension), peripheral artery disease, rheumatoid heart disease, congenital heart disease and heart failure. The major causes of cardiovascular diseases are physical inactivity, unhealthy diet and tobacco use (WHO, 2008)

Diabetes: there are different types of diabetes. This study concentrates on diabetes mellitus which is a chronic disease characterized by inability of the body to handle blood glucose, resulting from defects in insulin production, insulin action, or both (Centre for Disease Control and Prevention, 2005). It causes thirst, frequency of urination, tiredness and many other symptoms.

Anthropometric profiles: they are inexpensive tools for measuring the extent of human body fat in order to study and compare the relative proportion in under normal and abnormal conditions (Martinez, Bianchi, Gacia-Viejo, Bru & Gatell, 2000).

Morphologic and metabolic changes: In this study, they are related to the alterations in body composition, especially hyperlipidemias, fat redistribution (increased visceral adiposity or fat wasting of the arms, legs, buttocks, and face), and insulin resistance (Florindo, Latorre, Jaime & Segurado, 2007).

Barriers to physical activity participation: In this study, barriers refer to what limit people living with HAART to engage in any physical activity sufficiently.

1.9. LIST OF ABBREVIATIONS AND EXPLANATION

AIDS	Acquired Immune Deficiency Syndrome
BMI	Body Mass Index
CD4 cells	Cluster of differentiation 4 cells
HAART	High Active Antiretroviral Therapy
HIV	Human Immunodeficiency Virus
PA	Physical Activity
PLWH	People Living with HIV/AIDS
UNAIDS	Joint United Nations Programme on HIV/AIDS
USAID	The United States Agency for International Development
WC	Waist Circumference
WHR	Waist Hip Ration
WHO	World Health Organization
N	Frequency
%	Percentage

1.10. OUTLINE OF CHAPTERS

Chapter one highlights the background of the study, in which the prevalence of people living with HIV/AIDS is highlighted worldwide, in Sub-Saharan Africa and in Rwanda. The prevalence of people treated with high active antiretroviral therapy is also highlighted globally as well as in Rwanda. The benefits of physical activity/exercise for people living with HIV/AIDS treated with HAART are also highlighted in this chapter. The statement of the problem, the main and specific objectives and significance of the study were given. The chapter ends with the definition of key terms used in the study and the outline of chapters.

Chapter two presents a literature review that shows the complications of HAART especially the metabolic and morphologic changes. Under this heading, there is a description of the benefits of physical activity/exercise for HIV patients, followed by presentation of physical activity levels among people living with HIV/AIDS. A description of various physical activity health promotion programmes and strategies are addressed. This chapter concludes by describing the roles of physiotherapists in the prevention and management of HAART complications.

Chapter three gives the methodology used for this study. The research setting, study design, study population and sample are presented. Furthermore, the validity and reliability of the instrument utilized are indicated. The chapter also explains the procedures used to collect data together with methods utilized in their analysis. Finally, the issues of ethical considerations are highlighted.

Chapter four presents the results of the study. In this chapter, both descriptive and inferential statistic results of the study are described and presented in tables. The presence and absence of statistical significant association is indicated by chi-square test in term of P-value.

Chapter five interprets and discusses the findings of the study and implications of the results. In this chapter the similarities and contrasts between the current results and previous studies are explained. It ends with the lists of limitations encountered during this study.

Chapter six provides the summary of the study and recommendations. The important findings of the study are emphasized in the conclusion, and appropriate recommendations based on findings are suggested.

CHAPTER TWO: LITERATURE REVIEW

2.1. INTRODUCTION

This chapter includes the existing literature on the metabolic and morphologic changes associated with the use of HAART. It includes also the prevalence of physical activity levels globally and effects of physical activity for people living with HIV/AIDS, treated with HAART. Metabolic complications due to HAART are also highlighted. It also discusses health promotion of physical activity particularly to HIV people living with HIV/AIDS, treated with HAART. This chapter ends with discussing the important role played by physiotherapists in the promotion of physical activities for people living with HIV/AIDS, treated with HAART.

2.2. METABOLIC CHANGES AMONG PEOPLE LIVING WITH HIV/AIDS TREATED WITH HAART

People living with HIV/AIDS are currently treated with HAART, which facilitates them living longer, as it controls the virus. Despite the positive effects of HAART in controlling HIV, there are morphologic (fat accumulation or fat loss) and metabolic changes (hyperlipidemia and or insulin resistance) associated with its use (Gripshover et al., 2003; Saves et al., 2002). These changes are also known as lipodystrophy syndrome. According to Gripshover et al. (2003) morphologic changes were found in approximately 66% individuals and metabolic changes were found in approximately 71% individuals (Saves et al., 2002). In addition, there are many other conditions associated with HIV/AIDS like nausea, vomiting, dry mouth, fatigue, rash, peripheral neuropathy, insomnia, depression, and gastrointestinal

problems (Schiller, Arnold & Schwartz, 2004). These conditions are the result of the virus itself, medication or a combination.

One of the real potential risks of morphologic changes remains the threat of increased incidence of cardiovascular disease and diabetes among people living with HIV/AIDS, treated with HAART (Amorosa et al., 2005; Currier et al., 2002). Clinically, morphologic changes are commonly presented with fat accumulation or fat loss while metabolic changes are hyperlipidemia and or insulin resistance (Chen, Mistra & Garg, 2002). The fat accumulation is mostly located in the dorso-cervical region (buffalo hump), central abdominal region (crix belly), breasts and peripheral fat wasting commonly observable at face, buttocks, arms or legs (Currier et al., 2002).

The morphologic changes (fat accumulation and fat atrophy) are diagnosed with computer tomography scans, MRIs, and DEXA scans, but these tests are much more costly (Paton, Ng, Chua, Aboulhab & Karim, 2002). Inexpensive methods for diagnosing morphologic changes include sonography and anthropometric measurements (Martinez, Bianchi, Gacia-Viejo, Bru & Gatell, 2000; Kotler et al., 2002). The anthropometric measurements were successful tests for determining visceral fat accumulation from simple obesity (Kotler et al. 2002). The anthropometric measurements use three indices such as body mass index (BMI), waist circumference (WC) and a waist hip ratio (WHR) (Salyer, Debra, Settle, Elswick, Rackley, 2006). Then anthropometric model select fat individuals as those ones with BMI greater than 25, waist circumference greater than 88 cm (women) and 102 cm (men) and waist hip ratio of greater than 96 (men) and 0.81 (women).

Foucan, Hanley, Deloumeau & Suissa (2002) revealed that higher BMI is associated with a higher risk of death by cardiovascular disease. Moreover, the National Institute of Health (NIH) experts panels reported that people with waist circumference greater than 88 in women and 102 cm in men were at high risks of cardiovascular diseases and diabetes (Foucan et al.,

2002). Furthermore, waist circumference is a measuring tool of body fat that provides more information about health risks than the BMI alone does (Colby & Johnson, 2006). According to Florindo et al. (2004) waist hip ratio (WHR) is another good indicator of a central obesity. It reflects the relationship between reduction of the circumference of the waist and the increase in the abdominal circumference. Furthermore, a person with waist hip ratio greater than 0.95, as regards to gender, is at risks of cardiovascular diseases or diabetes (WHO, 2000). In addition, it is evidenced that waist-to-hip ratio (WHR) has been found to be more a efficient predictor of mortality in older people than waist circumference (WC) or body mass index (BMI) (Price, Uauy, Breeze, Bulpitt & Fletcher, 2006).

Medical treatment includes switching antiretroviral medications, taking medication to lower blood glucose, triglycerides, cholesterol, liposuction surgery and hormone therapy to help people suffering HIV/AIDS, treated with HAART, to decrease fat (Brewi, 2001). Exercise has been proved to provide many health benefits, ranging from increased aerobic fitness to improved mood for the general population. The scientific researches indicated that persons with HIV/AIDS can reap the same benefits of exercise as the general population (Pate et al., 1995).

2.3. PHYSICAL ACTIVITY LEVELS AMONG PEOPLE LIVING WITH HIV/AIDS TREATED WITH HAART

Physical activity participation is a very important health- related behavior for all people. More so for people living with HIV infection, treated with HAART. It is defined as a complex, multi-dimension behavior, characterized by different modes of activities such as occupational, household (eg. Care giving, domestic cleaning), transportation (eg. walking or cycling to work) and leisure-time activities (eg. dancing, swimming). Together with competitive sports involvement, these can qualify the regular participants to gain the level of

the considered active physical activity participation (Hardman & Stensel, 2003). Physical activity participation had been found efficient to fight quality of life diseases. Therefore, HIV patients under HAART, who are susceptible to suffer these kinds of diseases, are advised to regularly participate in physical activity to minimize their occurrence (Centre for Disease Control and Prevention, 2003; American College for Sport Medicine, 2002). Results from various scientific researches show that constant or interval aerobic exercise at 60–80% of maximum heart rate, or a combination of aerobic exercise and progressive resistance exercise for at least 20 minutes, three times a week, is beneficial. It appears to be safe for adults living with HIV/AIDS (O'Brien, Tynan, Nixon, Glazier, 2008; O'Brien, Nixon, Tynan, Glazier, 2004). Although, many studies proved the effectiveness of physical exercises/activity for people living with HIV/AIDS, treated with HAART, the prevalence and degree of physical activity undertaken by these people is not available in all countries, particularly African countries.

The study done in the United States of America by Clingerman (2003) showed that most of the HIV patients (86%) were involved in walking for 10 minutes at work or anytime during the day. This study showed that the majority of them (78%) did not meet the WHO 2010 physical activity recommendation. One year later, the study conducted by this author in the same country, found that the majority of participants (74%) met WHO 2010 physical activity recommendation (Clingerman, 2004). In both studies, this author has found that walking is the most common model of physical activity that HIV/AIDS patients engage in (Clingerman, 2003, 2004). Furthermore, Smit et al. (2006) carried out a study in the same country when comparing HIV patients under HAART, HIV persons who are not on treatment and with HIV-negative individuals revealed that, vigorous activities was lower among HAART

patients than HIV-positive participants who are not on treatments and then lower than HIV-negative individuals.

Contrary, Barroso and Powell-Cope (2000) found that patients with HIV infection utilize physical activity as self-care behavior. Standish et al. (2001) found that aerobic exercises were performed by a big number of people living with HIV infection (63%).

Farah, Barbara, Nelson and Jorge (2004) and Barroso (1995) in their studies, evaluating the levels of physical activity participation among people living with HIV/AIDS, found that the majority of them were involved in light activities that require minimal effort and predispose them to poor quality of life. However in the study that included the HIV-infected outpatients (87%) and non-HIV outpatients (55%), carried out in Australia by Fillipas, Bowtell-Harris, Holland, Ciccutini and Cherry (2008) reported that 75% of HIV-infected met recommended guidelines.

The study conducted in USA indicated that about 65.6% of people living with HIV-infection engaged into physical exercises at recommended level of suggested exercise, while about 33.3% of them reported that they live a sedentary life (Salyer et al., 2006). Strenuous sports, heavy work around the home and moderate recreational activity were the activities performed by a small number of participants (47%), (28%) and (27%) respectively (Salyer et al., 2006).

It is thus evident that most of the studies have been conducted in developed countries with little or no studies conducted in developing countries. Several studies have been conducted in Rwanda on different groups of people concerning their levels of physical activity. The results showed that the majority of the participants lived a sedentary life (Tumusiime & Frantz, 2006; Kagwiza, Phillips & Struthers, 2005; Murenzi, 2001). None of these were conducted among HIV patients. It is therefore that the investigator decided to conduct a study on levels of activities among persons with HIV-infection treated with HAART in Rwanda. It is to find out the extent & types of physical activities they are involved in.

2.4. EFFECTS OF PHYSICAL ACTIVITY AMONG PEOPLE LIVING WITH HIV/AIDS TREATED WITH HAART

Persons infected with HIV/AIDS, treated with HAART, and others who have chronic and debilitating illness, experience a disease that is variable in acuity, length and disability. HIV disease can deprive an individual of his/her physical and psychological resources, such as mobility, muscular strength, joint flexibility, endurance and energy (Clingerman, 2003). In addition to these, taking HAART makes people living with HIV to be more vulnerable to the development of metabolic and morphologic changes which were previously described (Gripshover et al., 2003; Saves et al., 2002). These authors indicated also that these complications increase HIV patients' risk for cardiovascular diseases and diabetes. Furthermore, Domingo, Sambeat, Perez, Ordonez, Rodriguez, Vazquet (2003), in their study conducted in Barcelona, found that the sedentary people in leisure PA were more likely to prevent atrophy, with reduction of subcutaneous fat of the limbs and an increase of central subcutaneous fat, as well as an increase in waist hip ratio.

Previously, the treatment adapted to manage those metabolic complications was concerned with switching ART regimens. The patients were given additional therapy directed at the specific condition associated. Unfortunately, this way of treating these complications resulted in the inability to controlling the virus load (Brewi, 2001). Therefore, the scientific researchers came with another way to manage these complications from HAART. According to Daryl (2004), the treatment recommended for these metabolic complications were to change the patient's ART regimen with diet, regular exercise, plastic surgery, recombinant growth hormones, metformin, thiazolidinediones and anabolic steroids. However, the use of medication continued to be inappropriate therapy for these complications. Various scientific studies revealed that physical activities/exercises are the best modalities to prevent or treat

the metabolic and morphological changes associated with HAART (Hand et al., 2007; Terry et al., 2006).

Various authors in their studies highlighted the effectiveness of regular moderate physical activities together with lifestyles changes (eating a healthy diet, and stopping smoking as in general population) to prevent and treat metabolic and morphologic (lipodystrophy) complications associated with the use of HAART (Hand et al., 2007); Terry et al., 2006); Bopp, Phillips, Fulk and Hand, 2003). These authors also reported that physical activities are beneficial for HIV patients through improving functional work capacity, body composition, psychological markers, and immunological measures. However, Cade, Fantry, Nabar, Shaw, and Keyser (2003) reported that there is no relationship between high energy intakes or reduced physical activity participation and metabolic complications (overweight or obese) among HIV patients.

According to Farah et al. (2004) and Roubenoff and Wilson (2001), moderate endurance training and or progressive resistance and strength training exercises are more effective in controlling body mass index, waist girth and body weight in patients with HIV/AIDS under HAART. Furthermore, Smith et al. (2001) reported that when HIV people participated regularly in physical activities, their abnormal weight reduced by normalizing their body mass index (BMI), subcutaneous fat and central fat. Recently, it was also reported that resistance exercise is useful to induce skeletal muscle hypertrophy and can counteract the muscle wasting effects of HIV/AIDS or associated with HAART (Sakkas et al., 2009).

Smit et al. (2006) concluded that vigorous exercise was more beneficial, especially in reducing risks of cardiovascular and type 2 diabetes mellitus through normalization of body mass index among HIV/AIDS patients. Recently, Cade et al. (2008) also indicated that post exercise heart rate improves cardiovascular and autonomic dysfunctions, which are usually associated with the use of HAART. Moreover, exercise training improves arterial

compliance, baroreflex sensitivity and autonomic profile in HIV positive people as well as reducing the traditional risk factors for cardiovascular disease (Spierer et al., 2007; Lima et al., 2009).

The resistance exercises play a vital role on functional work capacity. A study done in USA during six weeks showed that a combined moderate-intensity aerobic capacity and resistance training improved functional aerobic capacity (FAC). It also eliminates functional aerobic impairments (FAI) in HIV persons (Hand et al., 2007). Furthermore, a study done in Australia for people living with HIV, shows, when comparing the supervised- to unsupervised exercises, it revealed that supervised aerobic and resisted exercises, enhance cardiovascular fitness and self-efficacy, more than unsupervised walking program (Fillipas, Oldmeadow, Bailey & Cherry, 2006).

In Sub-Saharan countries, including Rwanda, there is only one study that is available. This study was conducted on both males and females. It also indicated the benefits of exercises in HIV patients treated with HAART (Mutimura, Stewart, Crowther, Yarasheski & Cade, 2008). These authors revealed that moderate exercise training enhances the quality of life of people living with HIV, treated with HAART, by alleviating abnormal fat distribution, restore body images and increase self-esteem. Several researchers reported the importance of exercises on psychological aspects among HIV patients. Aerobic exercises reduce the level of depression in HIV-positive individuals (Roubenoff, 2000). Another study reported that aerobic exercise of at least 20 minutes, three times a week, improves cardiopulmonary fitness and psychological well being for adults living with HIV-infection (Nixon, O'Brien, Glazier & Tynan, 2005).

Effects of physical activities influence the immunological measures positively. The exercise training facilitate increase of CD4 cells count of a person suffering HIV-infection regardless the stage of the disease, level of CD4 cells or symptomatology. A trend towards increased

numbers of CD4+ cells with more significant increases are seen in those people at earlier stages of the disease (Roubenoff et al., 1999; Laperriere et al., 1997).

Furthermore, a trend towards increased numbers of CD4 cells was more significantly seen in HIV patients who were at earlier stages of the disease. However, Bopp, Phillips, Fulk and Hand (2003) indicated the negative effects of vigorous activities for HIV/AIDS patients, like weakening the immune systems and making them more vulnerable to various infections. Recently, Souza, Jacob-Filho, Santarem, Silva, Li and Burattini (2008) revealed that progressive resistance training with or without endurance training increase the strength, improve fitness and improve CD4+ and CD4+/CD8+ counts in HIV positive elderly patients. Despite the above discussed benefits of physical activity participation, more than one third of patients with HIV/ADS did not meet the recommended level of suggested physical activity/exercise or participate in any form of structured exercise (Fillipas, Bowtell-Harris, Oldmeadow, Cicuttini, Holland, Cherry, 2008). Furthermore, this is thought to be more severe in rural communities (Sukati et al., 2005). Therefore, the appropriate programme to promote their activity participation needs to be elaborated and implemented.

2.5. HEALTH PROMOTION OF PHYSICAL ACTIVITY FOR PEOPLE LIVING WITH HIV/AIDS TREATED WITH HAART

Participation in physical activity has the significant positive impact on the health of individuals. The physical, social, emotional and cognitive benefits of physical activity participation are well-researched and are linked to the reduction of chronic illness and diseases (Sport and Health Thematic Profile, 2011). Inactivity is a major risk factor in a number of chronic diseases that are having immense impact on health status world-wide. Physical activity can reduce the risk of chronic lifestyle diseases such as cardiovascular

diseases, cancer, diabetes, obesity and mental illness (Sport and Health Thematic Profile, 2011).

According to Sport and Health Profile (2011), during recent decades, there has been a progressive decline in the level of physical activity in people's daily lives in developed countries. For a majority of people, little physical effort is involved in their work, domestic chores, transportation and leisure. Whilst specific health risks differ between countries and regions, the fact remains that physical inactivity is a major risk factor for most common non-communicable diseases. Physical activity can counteract many of the ill effects of inactivity (Sport and Health Thematic Profile, 2011).

Based on the definition of health promotion, which is the process of enabling people to increase control over, and to improve their health, researchers suggested that physical activity should be an important behavior for health promotion and disease prevention (Eyler et al., 1999). American College of Sports Medicine suggested that health promotion about physical activity should be provided during primary care setting (American College of Sports Medicine, 2000). Furthermore, the World Health Organization in its concern of health issues launched the “Health People 2010 recommendations” by encouraging individuals to participate in moderate intensity of physical activities for at least 30 minutes daily or at least five days or more a week to prevent diseases and disability due to sedentary lifestyle (Yach, 2002). Moreover regular physical activity is a health promotion behavior that facilitates coping in chronic conditions (Pender, Murdaugh & Parsons, 2002).

Many countries including Brazil, Sri Lanka, China, Mauritius, Pakistan and South Africa adopted this theme. They initiated physical activity interventions as part of the National Action Plan for Disease Prevention and Control through health promotion (Bus, 2006; Bauman et al., 2005). Rwandan government has encouraged people to be physically active. It recommends to its employees to reserve at least 3 hours of a certain working day for physical

exercises (Rwanda Government, 2005). Usually people use this opportunity in the afternoon of each Wednesday.

To improve general health benefits, adults should do at least 30 minutes of moderate intensity of physical activity a day, for five or more days a week. Vigorous activity could be done three or more times per week for at least 20 minutes (O'Brien, Tynan, Nixon, & Glazier, 2008); WHO, 2003). The recommended levels of activity can be achieved by doing the activity in one session, or through several shorted bouts of activity of 10 minutes or more. The activity can be lifestyle activity, structured exercise, sport or a combination of these. Miles (2007) reported that for many people, 45-60 minutes of moderate intensity physical activity a day is necessary to prevent obesity.

Various studies have shown that the above mentioned recommendation for health promotion, through physical activity is based on the paradigm of encouraging people to engage in any form of physical activity at moderate intensity. It is also appropriate for HIV/AIDS people under HAART (Pate et al., 1995). Previous concerns revolved around the belief that exercise could result in decreased effectiveness of the immune system, and possible decrease in CD4 cells count. However, several studies have shown that CD4 cells count does not change significantly with exercise (Bopp, Phillips, Fulk, and Hand, 2003; Roubenoff et al., 1999). Thus concluding, that exercise is likely to be safe for persons with HIV/AIDS.

There is enough scientific evidence indicating that exercising is not only appropriate but also warranted for patients with HIV/AIDS. Results from various meta-analyses reported that constant or intermittent aerobic exercise at 60–80% maximum heart rate, or a combination of aerobic exercise and progressive resistance exercise for at least 20 minutes, three times a week is beneficial and safe for adults living with HIV/AIDS (WHO, 2003). Furthermore, immunological and virological measures appear to be unaffected by aerobic exercise which is

an important consideration for those patients starting an exercise programme (Bopp, Phillips, Fulk, and Hand, 2003). There are also documented improvements in cardiopulmonary fitness and improved psychological outcomes including improved quality of life amongst exercisers (Mutimura, Stewart, Crowther, Yarasheski & Cade, 2008). This suggests that adults living with HIV could expect many of the well established benefits of exercise (Patel et al., 1995). Physical activities are important to all HIV patients in all three clinical stages of the disease (Derman, Whitesman, Dreyer, Patel, Nossel, Schweltnus, 2010).

According to Klemack (2011), the exercise guidelines for persons with HIV/AIDS in the beginning stage vary, depending on the stage of the person's HIV/AIDS, medications, functional capacity and symptoms. This author also recommended that people living with HIV under HAART should consult the physician before implementing an exercise program. In addition, most exercise prescriptions consist of endurance or resistance exercises, or a combination. It is important to have the client warm-up at a low intensity, followed by static stretching (Klemack, 2011). Aerobic exercise should be moderate in intensity, as high-intensity exercise is thought to depress immune function. Ideally, start with 15 minutes and gradually increase to 40 minutes, three times per week. Resistance exercise should be performed three days per week, if possible, waiting a full day between sessions (Klemack, 2011). Exercises should target all major muscle groups, and should range in intensity, based on the client's ability. Clients should begin slowly with low weight, repetitions, sets and gradually increase over time. Brewi (2001) revealed that when aerobic or resistance exercise is completed, the client should engage in cool-down exercise, followed by static stretching. Finally, throughout exercise, it is important to make sure the client stays properly hydrated (Brewi, 2001).

Alternatively, Bopp et al. (2003) recommend the number of weekly sessions should start with easy activities and should consistently increase until the patient can tolerate three to five sessions per week. If the patient is debilitated, a 40-minute session, for example, can be broken up into four 10-minute sessions until the client can work up to a continuous 40-minute session. In addition, Bopp et al. (2003) recommended the person with HIV to complete 4 to 6 weeks of aerobic training, before starting a resistance training program in order to improve conditioning and prevent overtraining.

As many people spend a large proportion of their time at work, a barrier to participate in physical activity is time. However, results indicate a need to consider how it impacts on their health. Thus it is helpful to the individuals, including HIV patients, to be facilitated to increase their physical fitness at their workplace. Interventions for physical activity participation at work, include encouraging people to use stairs rather than elevators. Also provide marked routes for walks during breaks (Infinite Wellness Solutions, 2011). Incentives should be attached to the involvement in physical activity. The author concluded that motivating people to incorporate physical activity at their work is important. Employers could provide onsite group exercise classes, like yoga, tai, chi or similar sessions before work / during lunch breaks / after work or to arrange corporate memberships or negotiated reduced fees for local health clubs and facilities (Infinite Wellness Solutions, 2011).

Even though, there are health promotion programmes to promote physical activity to all people in general, there is a need of a special health programme for people living with HIV/AIDS. Individuals with HIV are more vulnerable to develop metabolic dysfunction and abnormal fat distribution due to HIV itself or as complications of HAART (Shah, Tierney & Adams-Huet, 2005; Batterham, Garsia, & Greenop, 2000). Furthermore, HIV persons live life sedentarily by appraising their symptoms based on their self-knowledge. They then make

decisions regarding issues such as pain, symptom severity, health beliefs, and perceptions (Turk & Rudy, 1991).

American College of Preventive Medicine recommended that health promotion about physical activities should be delivered through counseling sessions during routine patient visits (Jacobson, Strobecker, Compton & Katz, 2005). According to Staten, Mercado and Ranger-Moore (2004) women with HIV raised physical activity levels after getting counseling and health education from health providers and community health workers. Furthermore, Williams (2002) indicated that patients with HIV are motivated if physical activities are initiated in an enjoyable way.

However, Ainsworth and Youmans (2002) found that patients with HIV were still lacking interest to participate in physical activity. Moreover, Buchholz and Purath (2007) reported that persons with HIV were still lacking motivation. This author stressed also that some health providers complain about lack of time to promote physical activity. Furthermore, some health providers complain about lack of knowledge on how to counsel HIV patients about physical activity participation (Douglas, Torrance, Teijlingen, Meloni & Ken, 2006).

However these studies have been done in developed countries. This is also another reason why researcher studied physical activity levels among people living with HIV/AIDS in Rwanda, a developing country.

2.6. PHYSIOTHERAPISTS IN THE PROMOTION OF PHYSICAL ACTIVITIES AMONG PEOPLE LIVING WITH HIV/AIDS TREATED WITH HAART

Physiotherapists (or physical therapists) are primary healthcare professionals who diagnose and treat individuals of all ages. Those who have medical problems or other health-related conditions, illnesses, or injuries that limit their abilities to move and perform functional

activities are treated by physiotherapists (US Department of Labor, 2011). Physiotherapists examine each individual and develop a plan using treatment techniques to promote the ability to move, reduce pain, restore function, and prevent disability (Canadian Physiotherapy Association, 2011). In addition, physiotherapists work with individuals to prevent the loss of mobility, before it occurs by developing fitness and wellness-oriented programs for healthier and more active lifestyles. They provide services to individuals and populations, to develop, maintain and restore maximum movement and functional ability throughout the lifespan. Physiotherapists play a primary role in preventing the diseases that are associated with low levels of physical activity, including HIV and AIDS. Furthermore, physiotherapists work with individuals that have HIV/AIDS, through provision of exercises as a strategy to reduce disabling consequences from chronic health problems caused by HIV infection.

Physiotherapists or physical therapists have the expertise in body movement and exercise and the knowledge of pathology and its effects on all systems. They are the ideal professionals to promote, guide, prescribe and manage exercise activities that enable people living with the disease to maintain or improve their level of physical activity (APTA, 2011). Therefore, physiotherapists are the most ideal health professionals to take the responsibility of promoting physical activity for the people living with HIV infection. Further studies also confirmed that physical exercise deliverance is of major concern for physiotherapists (Munishi, Frantz & Struthers, 2009; Useh, Akinpelu & Makinde, 2003).

The active participation of physiotherapists in encouraging HIV patients to do physical activity could be the answer of the complaint raised by other health providers. Thus, it is evidenced that the health professionals complain about lacking the knowledge on how to counsel HIV patients about physical activities (Douglas, Torrance, Teijlingen, Meloni & Ken, 2006). Clinicians are confronted with the diseases of physical inactivity. The strategy to

motivate sedentary individuals to become more active is to encourage physical activity related behavioral change when individuals encounter health professionals (Verhagen & Enbers, 2009). Therefore, physiotherapists who are healthcare professionals are trained in exercise prescription and have the potential to play an important role in promoting regular physical activity. Moreover, because of their training and experience, physiotherapists are ideally placed to promote the health and well being of individuals (including people living with HIV infection) through physical activity and exercise prescription (Verhagen & Enbers, 2009).

People living with HIV infections, treated with HAART, like to live a sedentary life due to long believe installed in their minds that exercises may reduce their immunity. Physiotherapists are well placed in encouraging HIV patients to participate in physical activities (Riddoch, Puig-Ribera & Cooper, 1998). These authors also reported that a well designed and delivered exercise program is the one based on physiological and psychological theories. Therefore, physiotherapists are more favorable to motivate HIV persons to be engaged in active lifestyles. They are more knowledgeable about physical and psychological benefits of physical exercises. In addition, it has been proved that physiotherapists are in the appropriate position to prescribe and conduct safer exercise programs (Riddoch et al. 1998).

Furthermore, Wills and Campbell (1992) highlighted the ability of physiotherapists in addressing the barriers to physical activity participation like fear of injury and lack of the experience to enjoy exercises. This knowledge of physiotherapists should enhance HIV/AIDS patients' participation into physical activity which rather requires a well trained clinical physiologist (Bopp, Fulk & Hand, 2003).

In addition, persons with a chronic disease like HIV infection are likely to initiate and maintain physical activity when health care providers are actively engaged in encouraging

patients to be more physically active and discuss exercise plans with them (Weidinger, Lovegreen & Elliot, 2008). By Weidinger, Lovegreen & Elliot (2008), this encouragement may be well done by physiotherapists as it was reported that they have a vital role to play for healthy people in educating, motivating enjoyment, helping them to be independence and taking personal choice for physical activity participation. Physiotherapists are the appropriate individuals to develop, launch and coordinate a national campaign purposed to promote physical activity participation (Tonkin, 1999). Therefore, physiotherapists, general practitioners and other caregivers alike should become aware of the physiotherapist's potential in promoting safe and healthy physical activity.

2.7. SUMMARY

As the literature review indicates, physical activity participation plays a big role in both the prevention and treatment of morphologic and metabolic complications caused by taking HAART. Through the review however, it is noted that physical activity participation is not an adapted lifestyle behavior for people living with HAART. This shows the great need for the implementation of strategies aiming at minimizing the risks of cardiovascular diseases and diabetes among people living with HIV/AIDS, treated with HAART, in Rwanda. This current study whose aim of determining the levels of physical activity participation among people living with HIV/AIDS, treated with HAART, might provide important information that would contribute in the implementation of those strategies.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. INTRODUCTION

This chapter describes the methods used in the study. Inclusions in this chapter are descriptions of the research settings, study design, study population, sampling techniques and data collection methods. Procedures and description of the pilot study are highlighted in this chapter. Furthermore, the data analysis and ethical considerations related to the study are also given.

3.2. RESEARCH SETTING

There are 11 health centres located in Kigali. Currently all HIV patients receive their HAART at these health centres. The researcher chose the health centres with the largest HIV client base, which are the Kicukiro Health Centre, the Kimironko Health Centre and the Psycho-Social Health Centre of Biryogo. A map of Rwanda was shown in order to illustrate the location of these Health Centres where the study was conducted (Figures 3.1 & 3.2).

Figure 3.1: Map of Rwanda showing the location of the health facilities. (Arrow shows the Kigali city where the study has been conducted)

Map of Health Facilities in Rwanda

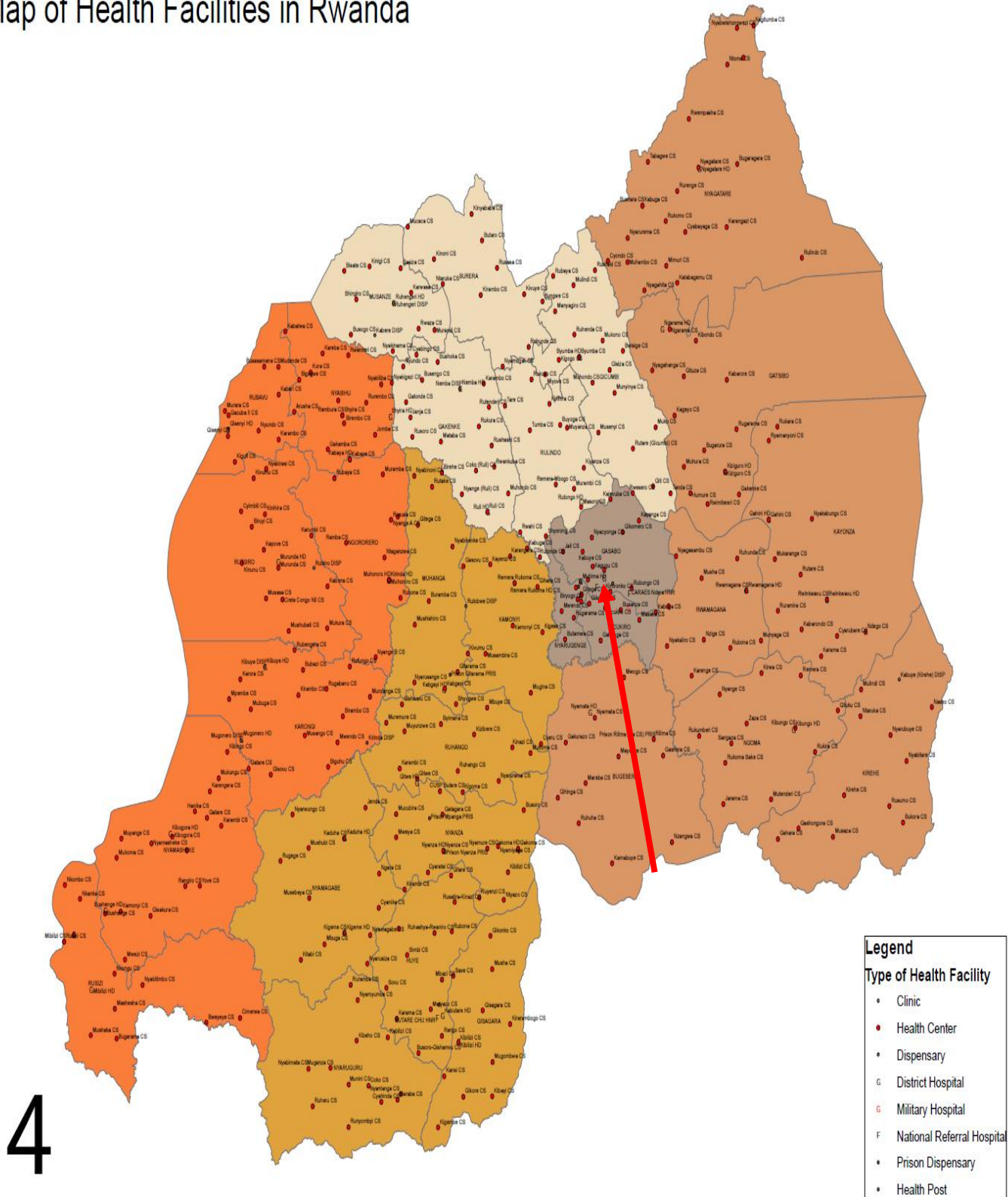
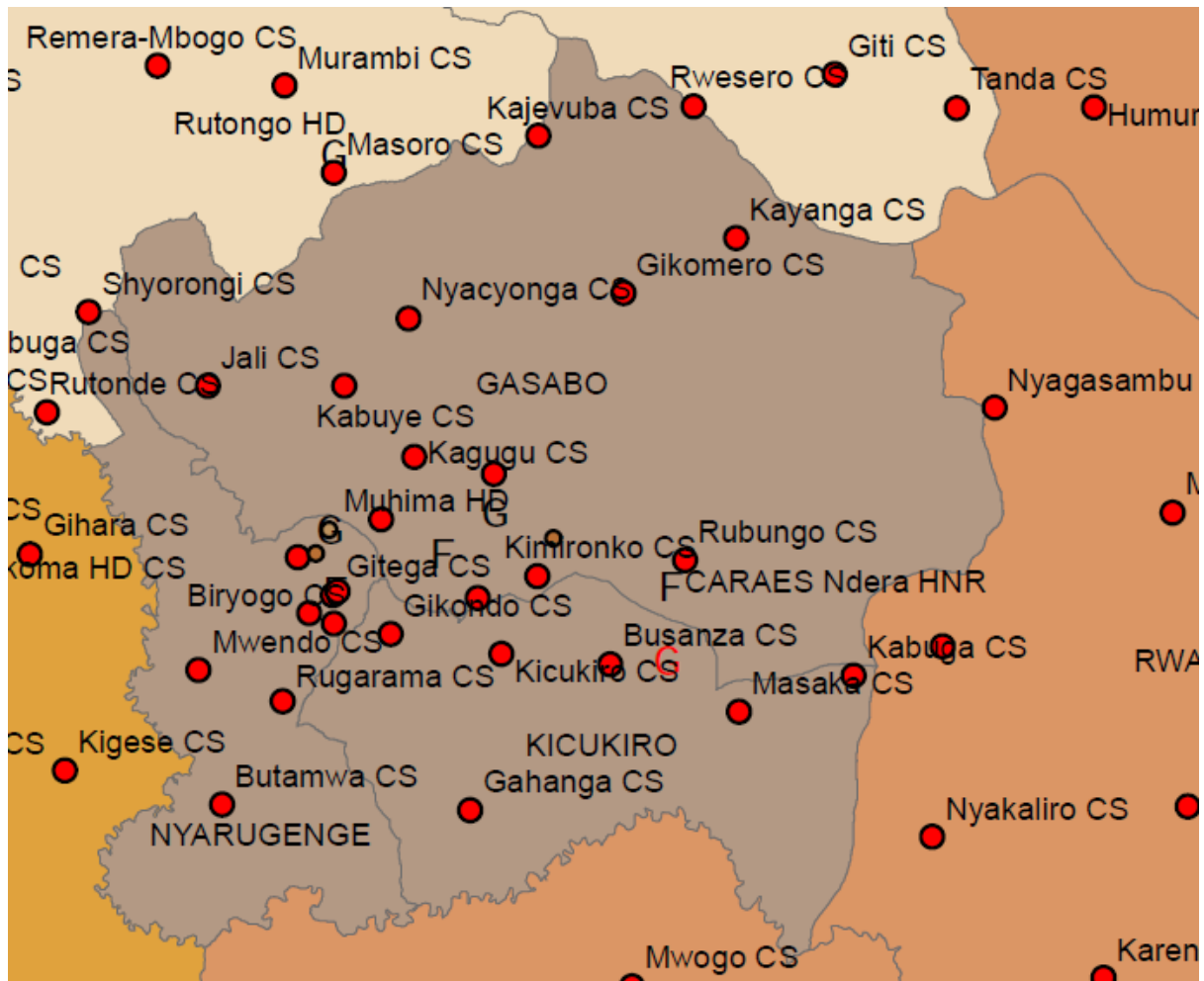


Figure 3.2: The expanded map of Kigali City show the health centres where the study was conducted.



3.2.1. Health Centre of Kicukiro

The Kicukiro Health Centre is situated in Kigali city, about 15 km from the town (Figure 3.2.). It is similar to other Health Centres, but it is one of the Health Centres used to pilot the prevention of Mother to Child Transmission (PMTCT), initiated by Bill Clinton, the former president of USA. The majority of pregnant mothers who are infected with HIV from Kigali city are referred to this centre. Treatment for these mothers is provided at a lower cost

compared to the other Health Centres in Kigali. It also has a new and well-equipped HIV/AIDS care unit.

3.2.2. Health Centre of Kimironko

The Kimironko Health Centre is located in Kigali city, about 30 km from the town of Kigali, in an area named Mumigina (Figure 3.2.). This township occupies the largest number of people who engaged in prostitution. It is one of the biggest Health Centres in Rwanda and it accommodates a large number of PLWHDs. It has also a well-occupied HIV/AIDS care unit.

3.2.3. Psycho-Social Health Centre of Biryogo

The Psycho-Social Health Centre of Biryogo is situated in Kigali, about 5 km away from the town, in one of the suburbs named Biryogo (Figure 3.2.). Initially this centre started as a private health centre that catered primarily for the psychosocial needs of the poor people living in that area. At present, this centre is affiliated with the national health centers. It focuses on the groups of commercial sex workers and poor people living in the vicinity. Apart from providing HAART, it also provides nutritional support to PLWHDs.

3.3. STUDY DESIGN

A quantitative cross-sectional descriptive study design was used in the present study. A descriptive design provides an overview of a situation as it naturally happens (Sarantakos, 2000). Descriptive studies are helpful in guiding the delivery of care services, health education and evaluation of community health services. It also provides baseline information upon which other intervention studies can be built.

The quantitative study design has the advantages of explaining the social life of the participants, theory testing, objectivity approach and use of high level of measurements

providing high levels of generalization of findings (Sarantakos, 2000). This design could also be chosen if it answered research questions on the present status of the participants (Gay & Airasan, 1999). Therefore it was considered as the most appropriate for this study. It indicates the present status of physical activity and anthropometric of HIV patients under HAART in Rwanda.

3.4. STUDY POPULATION AND SAMPLING

The study population included all adults, aged above 18 years, both males and females living with HIV/AIDS on HAART regimens for at least 12 months and attending the identified 3 centres. During data collection, approximately 647 patients passed through the three health centres. The allocation per centre was approximately 119 patients at Kicukiro health centre, 208 patients at Kimironko health centre and 320 patients at Psycho-social health centre of Biryogo. According to the Yamane's formula (Israel, 1992) $n = \frac{N}{1+N(e^2)}$, where n stands for sample; N for study population and e equal to 0.05, a representative sample size of the HIV patients was 407 participants. Thus proportionally, 92 participants were from the Kicukiro Health Centre, 137 participants from Kimironko Health Centre and 178 participants from Psycho-Social Health Centre of Biryogo. A convenient sample of people attending the clinic on the day that the researcher was present, was approached to participate in the study until the target number was reached. All these participations voluntarily agreed to participate in the study. The pregnant mothers were excluded in the study in order to avoid bias during measurement of anthropometric profiles.

3.5. DATA COLLECTION

3.5.1. Research Instrument

The data was collected by means of a structured self-administered questionnaire. The advantage of a self-administered questionnaire is that the respondents fill the questionnaire themselves, in which the respondent does not need necessary to be together with the researcher. It allows also a high response rate fairly quickly (Walliman, 2006). Attached to the questionnaire was the letter explaining the aim of the study as well as the consent form in which participants were requested to sign to ensure their voluntary participation in the study. The questionnaire consisted of three sections which were composed of closed ended questions.

The first section focused on the socio-demographic data of the participants and was composed of 8 items. These items included age, gender, marital status, level of education and occupation. In this section, the medical profiles, including duration on HAART, opportunistic diseases and CD4+ cells counts were also recorded to state the medical status of patients.

The second section consisted of the anthropometric measurements. These measurements included height, weight, waist and hip circumferences. Weight and height were measured, using digital scale and tape measure nearest to 0.1 kg and 0.1 cm respectively. Participants stood, wearing light clothes and no shoes. Waist and hip circumferences were measured using a non-stretch cloth tape measure. These measurements provided the researcher to get the anthropometric profiles such as BMI (weight of subject in kg divided by its height in meters), Waist circumference (halfway between the lowest ribs and iliac crests) and Waist hip ratio (waist circumference of participant divided with his/her hip circumference, both in meters).

The third section of the questionnaire addressed the types and levels of physical activity participation using the adapted Sub-Saharan African Questionnaire (SSAAQ) designed by Sobngwi, Mbanya, Unwin, Aspray and Albert (2001). It consists of 16 questions grouped in 5 parts, which assess the different categories of physical activities that every person performs. These are activities related to leisure-time, household, walking to and from work, shopping, school and church and occupation related physical activities. Then it assesses the subject's personal evaluation for physical activity levels in relation to the WHO recommendations. Frequency and duration of participation in these physical activities, as well as factors preventing them to participate, are also highlighted.

The SSAAQ is the most appropriate to use in Sub-Saharan populations (Sobngwi, Mbanya, Unwin, Aspray & Albert, 2001). The questionnaire will be however modified to suit to the persons with HIV/AIDS, treated with HAART, as well as for Rwandans. Therefore, risk factors, fear of worsening of the disease and lack of counseling on physical activities are included. Household physical activities are also incorporated. Those activities that are not commonly done by the Rwandan population were removed. These include horse riding, fishing, hunting and animal rearing. Activities were categorized according to their intensity: vigorous, moderate, light and sitting (WHO, 2003; Prochaska, Sallis, Sarkin & Calfas, 2000).

3.5.2. Procedure

After getting ethics clearance from the Senate Research Grants and Study Leave Committee of the University of the Western Cape, the approval to collect data was also requested and obtained from the National Ethics Committee of Rwanda. Permission to collect data was also obtained from the heads of selected health centres in Kigali, Rwanda. The process of data collection continued by training two research assistants, with at least one female who could speak and write English and Kinyarwanda fluently. Having a female in the collection team

was very helpful for the participants who would not be comfortable with a male. Basing on Rwandan culture, some female suggested to be taken anthropometric measurements by a woman (the researcher is a man) and this provoked the researcher to have a female among the research assistants. They were trained about the aim of the research, ethical considerations and proper anatomical alignment in taking the anthropometric measurements.

Prior to commencement of data collection at the centres, the researcher did a presentation, regarding the aims of the research with the staff and patients. The sampling method that was used was explained to the staff and patients at the centre. Once participants indicated their willingness to participate, the researcher obtained informed written consent from them, after explaining and ensuring that they understood the process. Data was then gathered either before or after the patient received their HAART treatment.

Participants who agreed to participate, completed the questionnaires. Their heights, weights, waist and hip circumferences were measured on the same day. This occurred in a private and comfortable place which was reserved for the researcher. The patient was weighed wearing light clothes and no shoes, to the nearest 0.1 kg. The height was measured to the nearest 0.1 cm. The participants were requested to stand on paper in an upright position with no shoes, close to the wall. A line at the level of the head was drawn for height measurements. The body mass index of each participant was obtained by taking his/her weight in kilograms, divided by the square of his/her height in meters). Waist circumference was taken at the narrowest circumference midway between the lowest ribs and iliac crests. Hip circumference was taken at the level of the anterior superior iliac spine, where this could be palpated, otherwise at the broadest circumference below the waist. Two measurements were taken, and if these differed by 2 cm, a third measurement was taken. The mean from waist and hip circumferences of each person was calculated to get waist-to-hip ratio (WHR).

3.5.3. Validity and reliability

Validity refers to the extent to which an instrument measures what we think it is supposed to measure (Sarantakos, 2000). The term reliability clearly defined by Babbie and Mouton (2005) as a matter of whether a particular technique applied repeatedly to the same object/subject would yield the same result each time. Thus, to ensure validity and reliability, the questionnaire used in this study was adapted from other questionnaires, which was used in prior research related to physical activity.

The participants' anthropometric profiles were taken twice. If these differed by 2 cm, the third measurement was taken to ensure the reliability. Furthermore, the research assistants were physiotherapists qualified in anatomical alignments. They could measure the proper alignment or position. The levels of physical activities were assessed by adapting the Sub-Saharan Africa Activity Questionnaire (SSAAQ). Sobngwi et al. (2001) reported that this questionnaire is the best and appropriate for measuring population physical activity levels in Sub-Saharan African populations, including Rwandan people. These authors showed that the questionnaire was highly reproducible ($P=0.95$; $p<0.01$).

The research questionnaires were available in English. Two experts were asked to translate them in Kinyarwanda which was the most common language used by the participants. Two others translated them back from Kinyarwanda to English. A pilot study was conducted among 15 PLWHDS, treated with HAART, who were not included in the main study. The aim of this pilot study was to test how well respondents understood the questions, clarity on how long it took to complete the questionnaire and the reliability of it. The conduction of a pilot study also had the purpose of finding out if the questionnaire should be subjected to any change, considering the information gathered before it was administered. The content validity

was also tested among experts in the area of physical activity, as well as experts dealing with HIV patients, to ensure that the categories added, are relevant.

Of the 15 participants who participated in the pilot study, 3 participants could not read and write. This prompted the researcher to consider how much his presence was needed during the completion of the questionnaire. These people would need assistance to answer the questionnaire. During the pilot study, it was indicated that the original question on walking to/ from work was not appropriate for all participants. Participants wanted to add common areas for people with no permanent job. They wanted walking to/ from shopping, school and church to be added. After the corrections were made based on the suggestions raised during the pilot study, a retest was done on the questionnaire with 10 adults living with HIV/AIDS treated with HAART. They did not participate in the pilot and main studies. Therefore, some changes were made to the structure of the original questionnaire, before distribution of it to the participants of the main study. The exclusion criterion introduced later was the exclusion of pregnant women. Finally, clear and precise instructions were given to the participants before the completion of the questionnaire to ensure their understanding of the questions.

3.5.4. Data analysis

Completed data was captured on a spreadsheet using the Microsoft Excel program in preparation for analysis. The data was then transferred into the Statistical Package for the Social Sciences (SPSS) version 19. Descriptive statistics was utilized to summarize the demographic data, medical profiles and anthropometric profiles and then physical activity levels as well as the factors associated to physical inactivity. Then the categorical data were given in the form of percentage and frequencies. The mean and standard deviations were then utilized for continuous data. Inferential statistics were employed like Chi-square test. It was to test the association between variables, such as level of participation in physical activity and

anthropometric profiles and then factors associated to physical inactivity. Alpha level was set at $P < 0.05$. The results are presented by means of tables.

3.5.5. Ethical considerations

Ethical clearance was obtained from the Senate Research Grants and Study Leave Committee of the University of the Western Cape. The Approval from the National Ethics Committee of Rwanda was also obtained. Permission to collect data was requested and obtained from the heads of selected health centres in Kigali, Rwanda. In the letter requesting permission, the researcher included a clear explanation of the study and its objectives. The issues of respect, confidentiality, anonymity and right to withdraw were guaranteed to the participants. Referring of subjects with risks of cardiovascular and diabetes, was done. Counseling was done with all people living with HIV/AIDS treated with HAART, who participated in the study. Participants were counseled as to include physical activity as part of their everyday life especially to the participants found that they were classified into overweight or obese category. The counseling was also given in order to prepare the participants for the process of the research and to gain their trust. Written informed consent was obtained from volunteers before completing the questionnaires. The feedback of results and recommendations will be given to the relevant parties.

3.6. SUMMARY

Chapter 3 discussed the method used in the study, sampling procedure and explanation of the instruments used to gather data and the procedure of how the data was collected and analyzed. The research settings were established in this chapter. In this chapter the researcher also explained how ethical considerations were applied. The next chapter is going to discuss the analysis of results of this study.

CHAPTER FOUR: RESULTS

4.1. INTRODUCTION

This chapter presents the results of the study regarding its specific and main objectives. The socio-demographic characteristics and health related status of participants were given descriptively. The anthropometric profiles and levels of physical activity were also highlighted. It presents also the association between variables stated above and the levels of physical activity among adults living with HIV/AIDS, treated with HAART. It concludes with self-evaluation of the participants about physical activity participation.

4.2. SOCIO-DEMOGRAPHIC CHARACTERISTICS AND HEALTH RELATED STATUS OF THE STUDY SAMPLE

This study included a sample of 407 people living with HIV/AIDS, treated with HAART, who attended the three selected health centers, located in Kigali city, Rwanda. The findings indicated that the majority of people surveyed were females (77%), while males were in the minority (23%). Participants' age ranged from 18 to 76 years, of which 63.4% were aged between 35 and 54 years. The mean age was 38.82 years with standard deviation (SD) of 8.9 years. It also showed that more than half (54%) of the participants were married and almost two thirds (65%) of participants declared that they had only finished primary school. The results also showed that the highest prevalence (51%) of participants had self-employment. Of the participants, 37% had spent six years and more on HAART. The majority (72%) of the participants had CD4 cell counts equal to or more than 350 per mm^3 . Of the participants who reported having opportunistic diseases (42.5%), approximately 63% had neuropathic diseases.

Table: 4.1. Distribution of selected socio-demographic and health related factors of the study sample (n= 407)

Variables	Characteristics	Frequency	Percentage (%)
Age	15-34 years	132	32.4
	35-54 years	258	63.4
	55 years and above	17	4.2
Gender	Males	95	23
	Females	312	77
Marital status	Single	27	7
	Married	219	54
	Divorced	102	25
	Widower	58	14
Education levels	Not attended school	47	11
	Primary	264	65
	Secondary	89	22
	Tertiary	7	2
Occupation	Public or private service	42	10
	Self-employed	208	51
	Farming or livestock	51	13
	Un-employed	106	26
Duration on HAART	Only 1 year	36	9
	2-3 years	87	21
	4-5 years	133	33
	6 years and above	151	37
CD4 Cell counts	Less than 200	28	7
	200 and < 350	84	21
	>= 350	290	72
Opportunistic diseases (42.5% n= 173)	Pulmonary	21	12
	Neuropathic	108	62.4
	Diarrhea	17	10
	Heart + diabetes	7	4
	Others	20	11.6

4.3. ANTHROPOMETRIC PROFILES OF THE PARTICIPANTS

The anthropometric profiles reported in this study, included Body Mass Index (BMI), Waist Circumference (WC) and Waist-to-Hip Ratio (WHR). The BMI was calculated from measured weight (kgs) and height (m) of the participants in this study. The subjects were divided into four categories according to their BMI, i.e. underweight ($<18.5\text{kg}/\text{m}^2$), normal weight ($18.5\text{-}24.9\text{kg}/\text{m}^2$), overweight ($25\text{-}29.9\text{kg}/\text{m}^2$) and obese ($>30\text{kg}/\text{m}^2$). Then with waist circumference (WC), the participants were classified in three categories in relation to their waist (categorized differently according to gender). Low risk (≤ 94 cm) for males and (≤ 80 cm) for females. Moderate risk (95-101 cm) for males and (81-87 cm) for females. High risk (102 cm and above) for males, and (88 cm and above) for females. Lastly, by WHR, participants were divided into three categories according to their measurements. They differed in ranges depending on gender, i.e. low risk (≤ 0.95 cm) for males and (≤ 0.80 cm) for females. Moderate (0.96-0.99) for males and (0.81-0.85) for females. High risk (1 and above) for males while it is 0.85 for females.

According to BMI, approximately 40% were in the obese ($n=65$) and overweight ($n= 96$) category. For waist circumference 31% were in the high risk category or having abdominal obesity. Then for Waist hip ration 43% were in the high risk category (or having central obesity) as indicated in table 4.2.

Table: 4.2. Anthropometric profiles of the participants

Variables	N (%)
BMI	
Underweight	17 (4.2%)
Normal weight	229 (56.3%)
Overweight	96 (23.6%)
Obese	65 (16%)
WC	
Low risk	227 (55.8%)
Moderate risk	55 (13.5%)
High risk	125 (30.7%)
WHR	
Low risk	161 (39.6%)
Moderate risk	72 (17.7%)
High risk	174 (42.7%)

4.4. THE ASSOCIATION BETWEEN THREE ANTHROPOMETRIC INDICES USED IN THE STUDY

The distribution of participants in relation to the anthropometric profiles was studied in Table 4.3. The results reported 44% participants were not classified as obese by any of these anthropometric indices. 24.3% of the the participants were classified as obese by every anthropometric measurement while 23.6% were obese in one of those anthropometric indices.

Table 4.3. The distribution of obese participants in relationship between the anthropometric indices.

Indices	Frequence of obese participants	
	Frequence	Percentage
Normal by any indice	179	44%
BMI + WC	112	27.5%
BMI + WHR	107	26.3%
WC + WHR	112	27.5%
BMI + WC + WHR	99	24.3%
Obese only in one indice	96	23.6%

4.5. FACTORS ASSOCIATED WITH ANTHROPOMETRIC PROFILES

The association between socio-demographic factors and health related status of participants (age, gender, marital status, educational level, occupation of the participant, HAART duration, etc.) and anthropometric profiles was illustrated in Table 4.4. It was studied by means of cross-tabulations and chi-square test for independence. Higher and lower p-values for the test statistic indicate the absence and presence of association respectively. The Alfa value used is 0.05.

In regard to body mass index, the majority (53%) of the participants with 55 years old and above were obese and very few (12%) of the participants aged between 15 to 34 year old are categorized into obese category. Approximately 45% of females and 22.1% of males were obese and overweight. About 47% of divorced participants were overweight and obese. The results also indicated that 40% of participants with secondary education levels were obese

and overweight. The self-employed participants represented a higher prevalence in high risk category. 45% of them were obese and overweight. The results also indicated that the majority of the participants (54%) who spent 6 years and above on HAART, were obese and overweight. 42% of those who had CD4 cell counts equal to or more than 350 were also obese and overweight. The findings also indicated that approximately 72% of participants who had heart diseases or diabetes, as opportunistic diseases, were obese and overweight. The body mass index was found to be associated with age, gender, education and CD4 cell counts of the participants ($p < 0.05$). No statistical significant association between body mass index and marital status, occupation, duration on HAART and opportunistic disease, as the chi-square test statistic obtained, was associated with a high p-value ($p > 0.05$).

In regard to waist circumference, the results of this study indicated that participants, aged between 55 years and above, were classified as high risk category/ having central obesity. It showed also that females had a high number (39.1%) in high risk category compared to the males (3.2%). The findings also indicated that 37% of divorced participants and approximately 86% of those with tertiary level of education were found in high risk category. The results also indicated that about 37% of self-employed and 33% of those who spent 6 years and above on HAART were classified into high risk category. About 34% of the participants with CD4 cell counts equal to or more than 350 and 71% of those ones who suffered heart diseases and diabetes were classified into high risk category. The chi-square test showed that there was a statistically significant association between age, gender, education level, occupation, duration on HAART and waist circumference. However, no statistical significant association was found between opportunistic diseases and CD4 cells count of the participants and waist circumferences.

According to the waist hip ratio, the findings have shown that the 53% of participants with 55 years old and above were classified into high risk category. Approximately 55% of females

were in the high risk category, while for males it was 3.2%. The results also showed that more than 49% of divorced and 86% of participants with tertiary education level were classified into high risks category. More than half (52%) of self-employed and half (50%) of participants who spent 4-5 years on HAART were found in the high risk category. Approximately 45% of the participants who had 350 and more CD4 cell counts and 71% of those who suffered heart diseases and diabetes were in the high risk category. The chi-square test indicated that there was no statistically significant association between age, marital status, education levels, CD4 cell counts, opportunistic diseases and waist hip ratio as the p-value associated with the chi-square test statistic, was found to be high ($p > 0.05$). However, no significant association ($p < 0.05$) was found between gender, occupation and duration on HAART and WHR profile.

Table 4.4. Factors associated with anthropometric profiles

FACTORS	BMI				WC			WHR		
	U	N	Ov	Ob	LR	MR	HR	LR	MR	HR
Age*										
15-34 years	3%	63%	22%	12%	65%	10%	25%	45%	22%	36%
35-54 years	4%	54%	26%	16%	53%	15%	32%	38%	17%	45%
55 years & above	0%	41%	6%	53%	24%	18%	59%	29%	18%	53%
Chi-square test	P= 0.002*				P= 0.009*			P= 0.430		
Gender*										
Female	4%	51%	25%	21%	46%	14.4%	39%	25.3%	19.9%	54.8%
Male	1.1%	77%	21%	1.1%	86%	10.5%	3.2%	86.3%	10.5%	3.2%
Chi-square test	P= 0.000*				P= 0.000*			P= 0.000*		
Marital status										
Single	0%	59%	30%	11%	33%	0%	67%	37%	26%	37%
Married	1.2%	60%	21%	16%	56%	15%	29%	42%	19%	39%
Divorced	6%	47%	25%	22%	38%	14%	49%	33%	18%	49%
Widower	7%	57%	28%	28%	24%	14%	62%	43%	9%	48%
Chi-square test	P= 0.114				P= 0.216			P= 0.267		
Education level*										
Not attended school	6%	62%	26%	6%	62%	13%	26%	40%	17%	43%
Primary	3%	59%	23%	14%	58%	15%	15%	42%	20%	39%
Secondary	2%	50%	22%	26%	51%	10%	39%	36%	36%	52%
Tertiary	0%	0%	57%	43%	86%	0%	14%	0%	14%	86%
Chi-square test	P= 0.007				P= 0.015			P= 0.083		
Occupation*										
Public/private service	2%	67%	17%	12%	71%	12%	17%	60%	12%	29%
Self-employed	5%	50%	26%	20%	37%	16%	47%	28%	20%	52%
Farming or livestock	0%	72%	18%	10%	76%	14%	10%	61%	16%	24%
Un-employed	3%	58%	25%	14%	57%	9%	34%	44%	16%	40%
Chi-square test	P= 0.146				P= 0.001*			P= 0.000*		
Duration on HAART*										
Only 1 year	3%	75%	11%	11%	75%	14%	11%	58%	6%	36%
2-3 years	1%	66%	17%	16%	59%	26%	14%	44%	25%	31%
4-5 years	2%	53%	26%	18%	56%	9%	35%	35%	14%	50%
6 years and above	21%	50%	29%	16%	50%	13%	33%	36%	19%	44%
Chi-square test	P= 0.057				P= 0.042*			P= 0.011*		
CD4 cell counts*										
Less than 200	22%	52%	19%	7%	69%	10%	21%	46%	14%	39%
200 and < 350	2%	61%	24%	13%	62%	14%	24%	48%	15%	37%
>= 500	2%	55%	24%	18%	52%	14%	34%	26.4%	18%	37%
Chi-square test	P= 0.000*				P= 0.253			P= 0.409		
Opportunistic disease										
Pulmonary	10%	52%	29%	10%	52%	19%	29%	24%	14%	62%
Neuropathic	4%	49%	28%	20%	45%	15%	40%	31%	21%	48%
Diarrhea	0%	76%	6%	18%	76%	6%	18%	53%	6%	41%
Heart + diabetes	14%	14%	29%	43%	29%	0%	71%	14%	14%	71%
Others	6%	50%	44%	0%	65%	10%	25%	45%	15%	40%
Chi-square test	P= 0.082				P= 0.138			P= 0.364		

*Significant at 5% level; U (underweight), N (normal weight), Ov (overweight), O (obese), LR (Lower risk), MR (moderate risk), HR (high risk).

4.6. LEVELS OF PHYSICAL ACTIVITY OF THE STUDY SAMPLE

The levels of physical activity participation were categorized depending on the recommendations of World Health Organization (WHO) for health. They recommend that adults should do a total of at least 30 minutes of moderate intensity physical activity a day, five or more days a week. It can also be three or more times per week for at least 20 minutes of vigorous activity in order to prevent the diseases due to sedentary lifestyles (Miles, 2008; WHO, 2003). Alternatively, the recommended levels of activity can be achieved either by doing the activity in one session, or through several shorted bouts of 10 minutes or more. The activity can be lifestyle activity, structured exercise or sport or a combination of these.

The participants who were physically active or sedentary, were obtained by taking all subjects in the study sample, that fit into the above mentioned recommendations. Clear explanation related to how the leisure-time, household, activities done at work and walking to or from work are classified in terms of their intensity (vigorous, moderate, light). The participants were asked to classify themselves into one category in each mode. Walking according to SSAAQ is categorized into walking brisk and slowly. Walking brisk is a moderate physical activity. Participants engaged in brisk walking for at least 30 minutes, (either going or coming from his/her place or sum of both) for at least three times a week, met the WHO recommendations. Moreover, each participant who was classified in either one or more modes/types of physical activity was considered as physically active.

Therefore, by applying the above criteria and relating them to the questionnaire, 4 levels of participation for physical activity were determined. Based on the results, a large percentage of participants were found to be inactive in each level (table 4.5). Furthermore, it has been found that the highest prevalence (82.6%) of inactive participants was in leisure-time

physical activity. The lowest prevalence of inactive participants was 61.7 % in work related physical activities.

Table 4.5. Types of physical activity according to levels of participation (n=407)

Types of activities	Inactive		Active	
	Frequency(N)	Percentage (%)	Frequency(N)	Percentage (%)
Leisure-time PA	336	82.6%	71	17.4%
Household PA	289	71%	118	29%
Work PA	251	61.7%	156	38.3%
Walking to/from work	306	75.2%	101	24.8%

4.7. BARRIERS TO PHYSICAL ACTIVITY PARTICIPATION

4.7.1. Barriers to participation in vigorous or moderate leisure-time physical activity

Barriers to participation in vigorous or moderate leisure-time physical activity were assessed for the study sample. Participants were requested to highlight one or more barriers by selecting yes or no. Table 4.6 indicates that the main barriers highlighted by participants were lack of motivation (30.5%) followed by the lack of time (25.3%). The fear of worsening of the disease (24.3%) was at the third place.

Table 4.6. Barriers to participation in leisure-time physical activity

Barriers	Frequency (n)	Percentage (%)
Lack of motivation	124	30.5%
Lack of time	103	25.3%
Fear of worsening of the disease	99	24.3%
Lack of counseling	98	24.1%
Health problem	89	21.9%
Lack and cost of sport equipment	60	14.7%
Transport cost	58	14.3%
Lack of facilities	57	14%
Culture barrier	55	13.5%
Lack of family support	51	12.5%
Others	1	0.2%

4.7.2. Barriers to participation in vigorous or moderate household physical activity

Traditionally and culturally, Rwandan people encountered barriers to participate in household activities. Thus the most barriers to vigorous or moderate household physical activity were illustrated in Table 4.7. Therefore, participants who engaged in sitting activities at home were requested to highlight the barriers they encountered. Note that participants could highlight one or more limitations. Having a domestic helper and children who can work were the first two barriers highlighted by many participants. About 33.3% and 20.4% of participants mentioned having a domestic helper and having children who can do the work respectively as barriers to participate in household physical activity.

Table 4.7. Barriers to participation in vigorous or moderate household physical activity.

Barriers	N (%)
Have domestic helper	36 (33.3%)
Have children who can do the work	22 (20.4%)
Tired after work	20 (18.5%)
Don't have time	18 (16.7%)
Have relatives who can do the work	12 (11.1%)

4.8. SELECTED FACTORS ASSOCIATED WITH PHYSICAL ACTIVITY

PARTICIPATION

In this section, the association between physical activity participation in each type and socio-demographic factors with health status of participants, is illustrated.

4.8.1. Physical activity participation according to age

The association between types of physical activities and age is given in table 4.8. The results indicated that the majority (88%), (79%) and (63%) of participants classified into 35-54 age range, engaged inactively in leisure-time, walking and work physical activities respectively. 76% of those with 55 years and above engaged in household physical activity, were inactive. The results indicated that there was no statistical significant association between age and types of physical activities (leisure-time, household, walking and work physical activities) as the p-values associated with the test statistics of these variables were high ($p > 0.05$).

Table 4. 8. Physical activity participation according to Age

Participation in PA	Age		
	15-34 years	35-54 years	55 years & above
Leisure-time PA			
Inactive	104 (79%)	219 (88%)	13 (76%)
Active	28 (21%)	39 (22%)	4 (24%)
Chi-square test	P= 0.258		
Household PA			
Inactive	95 (72%)	181 (70%)	13 (76%)
Active	37 (28%)	77 (30%)	4 (24%)
Chi-square test	P= 0.820		
Walking			
Inactive	90 (68%)	203 (79%)	13 (76%)
Active	42(32%)	55 (21%)	4 (24%)
Chi-square test	P= 0.075		
Work PA			
Inactive	80 (61%)	163 (63%)	8 (47%)
Active	52 (39%)	95 (37%)	9 (53%)
Chi-square test	P= 0.397		

PA: physical activity

4.8.2. Physical activity participation according to gender

Physical activity participation was studied according to gender of participants. As indicated by the results in table 4.9, females were more physically inactive in leisure-time (85%) compared to males (76%). However, males were more physically inactive (86%), (82%) and

(70%) in all other remaining physical activities such as household, walking and work physical activities respectively. Inactive females were 66%, 73% and 59% in household, walking and work physical activities respectively. The chi-square test indicated that gender was statistically significant ($p < 0.05$). This means that there is an association with gender and the above-mentioned types of physical activities, except walking as physical activity ($p > 0.05$).

Table 4.9. Physical activity participation according to Gender

Participation in PA	Gender	
	Male	Female
Leisure-time PA*		
Inactive	72 (76%)	264 (85%)
Active	23 (24%)	48 (15%)
Chi-square test	P= 0.047	
Household PA*		
Inactive	82 (86%)	207 (66%)
Active	13 (14%)	105 (34%)
Chi-square test	P= 0.000	
Walking		
Inactive	78 (82%)	228 (73%)
Active	17 (18%)	84 (27%)
Chi-square test	P= 0.074	
Work PA*		
Inactive	67 (70%)	184 (59%)
Active	28 (30%)	128 (41%)
Chi-square test	P= 0.043	

PA: physical activity

*Significant at 5% level

4.8.3. Physical activity participation according to marital status

The association between types of physical activity participation is illustrated in table 4.10.

The results have shown that married participants who were inactive represented higher

percentage (85%), (79%) and (64%) in leisure-time, walking and work physical activities. Inactive single participants had the higher percentage (89%) in household. The chi-square test indicated that there was no statistically significant association ($p > 0.05$) between these types of physical activity and marital status of participants.

Table 4.10. Physical activity participation according to marital status

Participation in PA	Marital status			
	Single	Married	Divorced	Widower
Leisure-time PA				
Inactive	20 (74%)	187 (85%)	80 (78%)	48 (83%)
Active	7 (26%)	32 (15%)	22 (22%)	10 (17%)
Chi-square test	P= 0.288			
Household PA				
Inactive	24 (89%)	153 (70%)	71 (70%)	40 (69%)
Active	3 (11%)	66 (30%)	31 (30%)	18 (31%)
Chi-square test	P= 0.209			
Walking				
Inactive	19 (70%)	172 (79%)	74 (73%)	40 (69%)
Active	8 (2%)	47 (21%)	28 (27%)	18 (31%)
Chi-square test	P= 0.357			
Work PA				
Inactive	15 (55%)	140 (64%)	64 (63%)	31 (53%)
Active	12 (45%)	79 (36%)	38 (36%)	27 (47%)
Chi-square test	P= 0.464			

PA: physical activity

4.8.4. Physical activity participation according to education levels

Physical activity participation according to education level of participants was also studied. The results are provided in table 4.11. They show that the majority of inactive participants

(85.7%) in all activities such as household, walking and work physical activities respectively had tertiary education level, except in leisure-time physical activity where it was the participants with primary education level (86.2%). No statistically significant association was found between education level and all four types of physical activity ($p > 0.05$).

Table 4.11. Physical activity participation according to education levels

Participation in PA	Education levels			
	Not attended school	Primary	Secondary	Tertiary
Leisure-time PA				
Inactive	37 (79%)	219 (86.2%)	73 (82%)	6 (85.7%)
Active	10 (21%)	45 (13.8%)	16 (18%)	1 (14.3%)
Chi-square test	P= 0.571			
Household PA				
Inactive	34 (72%)	179 (70%)	69 (78%)	6 (85.7%)
Active	13 (28%)	85 (30%)	20 (22%)	1 (14.3%)
Chi-square test	P= 109			
Walking				
Inactive	33 (70%)	198 (78%)	68 (76%)	6 (85.7%)
Active	14 (30%)	66 (22%)	21 (24%)	1 (14.3%)
Chi-square test	P= 0.390			
Work PA				
Inactive	29 (62%)	157 (62%)	58 (65%)	6 (85.7%)
Active	18 (38%)	107 (38%)	31 (35%)	1 (14.3%)
Chi-square test	P= 0.148			

4.8.5. Physical activity participation according to occupation

The relationship between physical activity participation and occupation of the participant was also studied. As shown by the results (table 4.12), it was found that for leisure-time physical activity, the higher prevalence (85%) of participants who were inactive were unemployed. For household, walking and work physical activities, the higher prevalence (86%, 85% and 69% of inactive participants respectively were working in public and private institutions. The chi-square test showed that there was no statistically significant association between types of physical activity and occupation ($p > 0.05$).

Table 4. 12. Physical activity participation according to occupation

Participation in PA	Occupation			
	Public/private service	Self-employed	Farming/livestock	Un-employed
Leisure-time PA				
Inactive	33 (79%)	173 (83%)	40 (78%)	90(85%)
Active	9 (21%)	35 (17%)	11 (22%)	16(15%)
Chi-square test	P= 0.676			
Household PA				
Inactive	36 (86%)	149 (72%)	34 (67%)	70(66%)
Active	6 (14%)	59(28%)	17 (33%)	36(34%)
Chi-square test	P= 0.103			
Walking				
Inactive	36(85%)	154(74%)	35(69%)	81(76%)
Active	6(15%)	54(26%)	16(31%)	25(24%)
Chi-square test	P= 0.272			
Work PA				
Inactive	29(69%)	133(64%)	25(49%)	64(60%)
Active	13(31%)	75(36%)	26(51%)	42(40%)
Chi-square test	P= 0.176			

PA: physical activity

4.8.6. Physical activity participation according to the duration on HAART

Table 4.13 presents the results of association between physical activity participation and duration on HAART. Participants on HAART for 4 to 5 years had the highest prevalence (83.45%) of inactivity in leisure time physical activity, The highest prevalence of physically

inactive participants (83.45%) in leisure-time were on HAART for 4 to 5 years, then 83% for the ones who spent only 1 year on HAART and then 82% and 68% of the ones who spent 2-3 years on it in walking and work physical activities respectively. The chi-square test indicated that there was no statistically significant association ($p > 0.05$) between these four types of physical activity participation and the duration on HAART.

Table 4.13. Physical activity participation according to duration on HAART

Participation in PA	Duration on HAART			
	Only 1 year	2-3 years	4-5 years	6 years & above
Leisure-time PA				
Inactive	29 (81%)	70 (80%)	111 (83.45%)	126 (83.44%)
Active	7 (19%)	17 (20%)	22 (16.55%)	25 (16.56%)
Chi-square test	P= 0.914			
Household				
Inactive	30 (83%)	66 (76%)	91 (68%)	102 (68%)
Active	6 (17%)	21 (24%)	42 (32%)	49 (32%)
Chi-square test	P= 0.175			
Walking				
Inactive	24 (67%)	71 (82%)	99 (74%)	112 (74%)
Active	12 (33%)	16 (18%)	34 (26%)	39 (26%)
Chi-square test	P= 0.328			
Work PA				
Inactive	24 (67%)	59 (68%)	77 (58%)	91 (60%)
Active	12 (33%)	28 (32%)	56 (42%)	60 (40%)
Chi-square test	P= 0.440			

4.8.7. Physical activity participation according to CD4 cell accounts

Physical activity participation according to CD4 cell accounts was studied. The results (table 4.14) indicate that the majority (83%, 68%, 74% and 60%) of participants who were inactive in leisure-time, household, walking and work physical activities respectively had 350 CD4 cell counts per mm^3 and more. Work physical activity was found to be associated with CD4 cell accounts ($p < 0.05$). However, there was no statistically significant association found between leisure-time and walking and household physical activities in relation to CD4 cells account ($p > 0.05$).

Table 4.14. Physical activity participation according to CD4 cells account

Participation in PA	CD4 cells account		
	Less than 200	200 and < 350	>= 350
Leisure-time PA			
Inactive	22 (88%)	69 (82%)	240 (83%)
Active	6 (12%)	15 (18%)	50 (17%)
Chi-square test	P= 0.856		
Household			
Inactive	24 (86%)	63 (75%)	197 (68%)
Active	4 (14%)	21 (25%)	93 (32%)
Chi-square test	P= 0.088		
Walking			
Inactive	25 (89%)	60 (74%)	216 (74%)
Active	3 (11%)	24 (26%)	74 (26%)
Chi-square test	P= 0.162		
Work PA*			
Inactive	24 (86%)	48 (57%)	174 (60%)
Active	4 (14%)	36 (43%)	116 (40%)
Chi-square test	P= 0.020		

*Significant at 5% level

4.8.8. Physical activity participation according to opportunistic diseases

The results have been showed that the highest prevalence (94%), (94%), (76%) and (76%) were inactive participants in each type of physical activity such as leisure-time, household,

walking and work physical activities respectively who suffered diarrhea. The association between physical activity participation and opportunistic diseases is illustrated in table 4.15. There was no statistically significant association have been found ($P > 0.05$) between opportunistic diseases and types of physical activity.

Table 4.15. Physical activity participation according to opportunistic diseases

Participation in PA	Opportunistic diseases				
	Pulmonary	Neuropathic	Diarrhea	Heart & diabetes	Others
Leisure-time PA					
Inactive	16(76%)	87(81%)	16(94%)	5(71%)	18 (90%)
Active	5(24%)	21(19%)	1(6%)	2(29%)	2 (10%)
Chi-square test	P= 0.443				
Household PA					
Inactive	15 (71%)	72(67%)	16 (94%)	6(86%)	13 (65%)
Active	6 (29%)	36(33%)	1 (6%)	1(14%)	7 (35%)
Chi-square test	P= 0.171				
Walking					
Inactive	16 (76%)	82(76%)	13 (76%)	5(71%)	14 (70%)
Active	5 (24%)	26(24%)	4 (24%)	2(29%)	6 (30%)
Chi-square test	P= 0.983				
Work PA					
Inactive	11 (52%)	64(59%)	13 (76%)	3(43%)	11 (55%)
Active	10 (48%)	44(41%)	4 (24%)	4(53%)	9 (45%)
Chi-square test	P= 0.491				

PA: physical activity

4.9. ASSOCIATION BETWEEN ANTHROPOMETRIC PROFILES AND PHYSICAL ACTIVITY PARTICIPATION

The association between anthropometric profiles and types of physical activities was illustrated in table 4.16. According to participants' BMI, the highest prevalence (88%, 72%, 83% and 66% for inactive participants in leisure-time, household, walking and work physical activities respectively) were obese. However, the chi-square test indicated that there was no statistical significant association between types of physical activities and body mass index ($P > 0.05$).

According to waist circumference, the highest prevalence (90%), (82%) and 63% of participants classified into high risk category were inactive in almost all types of physical activities such as leisure-time, walking and work physical activities except in household physical activity in which the highest prevalence (74%) of participants were inactive. They were classified in the low risk category. A statistically significant association was found between waist circumferences and both leisure-time and work activities. However, the results indicated that there was no relationship between waist circumference and both household and walking physical activities.

In regard to waist hip ratio, the biggest percentage (87%) and (79%) of the participants in leisure-time and walking physical activities respectively were inactive and classified into high risk category. Then About 69% and 62% of inactive participants in household and work physical activities respectively were classified into high risk category. A statistically significant association was found between waist-to-hip ratio and leisure-time physical activity ($p < 0.05$). Waist hip ratio was not significantly associated with household, walking and work physical activities.

Table 4.16. Association between anthropometric profiles and levels of physical activity participation.

Variables	Leisure-time PA		Household PA		Walking to-from work		Work PA	
	Inactive	Active	Inactive	Active	Inactive	Active	Inactive	Active
BMI								
Underweight	93%	7%	71%	29%	57%	43%	50%	50%
Normal weight	79%	21%	72%	28%	74%	26%	61%	39%
Overweight	86%	14%	66%	34%	77%	23%	62%	38%
Obese	88%	12%	72%	28%	83%	17%	66%	34%
Chi-square test	P= 0.145		P= 0.756		P= 0.174		P= 0.705	
WC								
Low risk	80%	20%	74%	26%	69%	31%	60%	40%
Moderate risk	78%	22%	62%	38%	85%	15%	65%	35%
High risk	90%	10%	70%	30%	82%	18%	63%	37%
Chi-square test	P= 0.043		P= 0.185		P= 0.003		P= 0.686	
WHR								
Low risk	76%	24%	76%	24%	74%	26%	65%	35%
Moderate risk	86%	14%	64%	36%	66%	34%	54%	46%
High risk	87%	13%	69%	31%	79%	21%	62%	38%
Chi-square test	P= 0.030		P= 0.111		P= 0.109		P= 0.315	

*Significant at 5% level

4.10. SELF-EVALUATION OF PHYSICAL ACTIVITY PARTICIPATION REGARDING WHO RECOMMENDATIONS.

4.10.1. Participants' views about meeting WHO physical activity recommendations

Information on self-evaluation of physical activity participation is provided in table 4.17. The results indicate that the majority (53.3%, 58.1%, 54.9% and 53%) of inactive participants in all types of physical activities thought they met WHO guidelines concerning physical activity participation. Furthermore, the higher prevalence of participants who felt that they met WHO 2010 physical activity recommendation found in active participants than inactive ones in all types of physical activities. Chi-square test indicated that evaluation of meeting WHO recommendations was significantly associated ($p < 0.05$) with types of physical activities (leisure-time, walking and work), except only one (household physical activity) ($p > 0.05$).

Table 4.17. Participants' views about meeting WHO physical activity recommendations

Participation in PA	Meeting WHO recommendations		P-Value
	NO	Yes	
Leisure-time PA*			P= 0.000
Inactive	46.7%	53.3%	
Active	19.7%	80.3%	
Household PA			P= 0.925
Inactive	41.9%	58.1%	
Active	43.4%	57.6%	
Walking*			P= 0.010
Inactive	45.1%	54.9%	
Active	32.7%	67.3%	
Work PA*			P= 0.028
Inactive	47%	53%	
Active	34%	66%	

PA: physical activity

*Significant at 5% level

4.10.2. Participants' opinions about following WHO physical activity guidelines

As reported in table 4.18, the highest number (61%), (43.2%), (45.9%) and (39.1%) of the participants were inactive in all types of physical activities. They reported that they hoped to do the same amount of physical activity intensity as recommended by WHO. It also showed that the majority of both inactive and active participants in all types of physical activities reported that they wanted to do the same physical activity as recommended by WHO. Work physical activities found to be associated with participants' opinions ($p < 0.05$). However,

there was no statistically significant association was found between leisure-time, household, walking physical activities in relation to the participants' opinions ($p > 0.05$).

Table 4.18. Participants' opinions about following WHO physical activity guidelines

Participation in PA	Participants' opinions				P-Value
	More	The same	Less	Don't know	
Leisure-time PA					P= 0.414
Inactive	54 (16%)	204 (61%)	27 (8%)	51 (15%)	
Active	17 (24%)	39 (55%)	4 (5%)	11 (16%)	
Household PA					P= 0.774
Inactive	48 (17%)	176(61%)	23 (8%)	42 (14)	
Active	23 (19%)	67 (57%)	8 (7%)	20 (17%)	
Walking					P= 0.263
Inactive	47 (15.5%)	187(61%)	23 (7.5%)	49 (16%)	
Active	24 (24%)	56 (55%)	8 (8%)	13 (13%)	
Work PA*					P= 0.018
Inactive	32 (13%)	159(63%)	20 (8%)	40 (16%)	
Active	39 (25%)	84 (54%)	11 (7%)	22 (14%)	

*Significant at 5% level

4.11. SUMMARY

The current study aimed to determine the levels of physical activity among people living with HIV/AIDS, treated with HAART, in Kigali, Rwanda. Then to identify the anthropometric profiles associated with physical inactivity, as well as factors contributing to physical inactivity among these people. The majority of participants found to be physically inactive in all four types of physical activity. The results indicated that the participants involved in work physical activity represented more active participants compared to others. Furthermore, the anthropometric indices indicated that more than one third (40% by BMI, 31% by WC and

43% by WHR) of the participants had abnormal fat redistribution or were at high risks of developing cardiovascular diseases and type 2 diabetes mellitus.

In addition, different factors associated with physical activity were highlighted. Due to the importance of physical activity in the management of complications caused by HAART, the emphasis should be focused on encouraging these people to engage sufficiently in all types of physical activity, especially the structured/ planned physical exercises. The next chapter will present an integrated discussion of the data highlighted in this chapter.

CHAPTER FIVE: DISCUSSION

5.1. INTRODUCTION

The aim of the study was to determine the levels of physical activity among people living with HIV/AIDS, treated with HAART, in Kigali, Rwanda. This chapter therefore discusses the result of the study in the context of the aim and objectives. Furthermore, the findings are analyzed and discussed in relation to similar studies or contextual data to give inferences. The chapter concludes by highlighting the limitations of the study.

5.2. SELECTED DEMOGRAPHIC AND HEALTH RELATED FACTORS AND THEIR ASSOCIATION TO PHYSICAL ACTIVITY PARTICIPATION.

This study has shown that the majority (63.4%) of participants were aged 35-54 years. This highlights that the most productive age group (young adults) was the most affected by HIV/AIDS. These findings are supported by the results given by Opara, Umoh and John (2007). They found that the majority (51.4%) of people living with HIV/AIDS, attending the clinic in Southern Nigeria were aged 31-50 years. In addition, the HIV infection rate is higher in adolescent and young adults than adult people in Sub-Saharan Africa including Rwanda (UNAIDS, 2007).

The findings of this study also indicated that the majority of the participants were females (76.9%). This is probably due to the fact that the majority of the people living with HIV infection in Rwanda are females (57.6%). It is therefore not surprising that females with HIV are predominantly treated with HAART, in Rwanda. Furthermore, a high number of HIV infected males do not visit the health centers. They prefer to send only their wives to get medicines on their behalf and/or share if both infected. This was stated by many females

during the process of data collection. In addition, CNLS Rwanda (2007) reported a high rate of HIV infection in prostitute women than other groups. Of the 407 participants, 53.8% of participants were married. These findings are similar to the results reported by Opora et al. (2007) that the majority (48.6%) of participants were married.

Studies showed that the HIV infection rate seems always to be higher in population groups with extreme poverty (Wojcicki & Malala, 2001). It is not different in this study therefore that more than two-third (64.9%) of the participants were only educated at primary level. Furthermore, CNLS Rwanda (2007) reported a high rate of HIV infection in prostitutes than any other groups. It is not surprising that these groups of people, who have limited income, end up in situations which make them more vulnerable to HIV infection. In comparison tertiary educated people count lesser than 1% of the whole population of Rwanda according to the survey of 2003 (World Bank, 2004).

The findings of this study revealed that the majority (72%) of the participants counted 350 CD4 cells and above. This is considered adequate CD4 cells for being physically active (Florindo, Latorre, Jaime & Segurado (2007). This gives us an overview that participants, if they wish to, may participate safely and actively in physical activity as their health improves when taking HAART. The findings on health status in this study showed that the majority of the participants were treated with HAART for 6 years and above. This seemed to be an important determinant in this study for assessing the morphologic and metabolic changes. Various scientific researchers revealed that metabolic and morphologic changes are already present 12 months after the initiation of taking HAART (Saves et al., 2002). Thus, the profile of participants in the current study does not differ too much from other studies.

5.3. ANTHROPOMETRIC PROFILES AS RISKS FOR CARDIOVASCULAR DISEASES AND DIABETES.

Various studies revealed that the anthropometric measurements are inexpensive methods for diagnosing morphologic changes and successful testing for determining visceral fat accumulation from simple obesity (Kotler et al. 2002; Martinez, Bianchi, Gacia-Viejo, Bru & Gatell, 2000). The findings of this study showed that approximately 40% of participants were categorized as either overweight or obese by body mass index. The findings do not differ from that found by Florindo, Latorre, Jaime & Segurado (2007) that 31% of HIV patients treated with HAART, were overweight and obesity accounted for 14%. Apart from BMI, the current study used other anthropometric measurements such as waist circumference and waist-hip ration. It was evidenced that waist circumference is a better tool to predict risks for cardiovascular and diabetes diseases than body mass index. Waist-hip ratio proved to work better than waist circumference and body mass index (Price, et al., 2006). Therefore, the findings indicated that approximately 31% and 43% of the participants had abdominal obesity, by assessing waist circumference and waist-hip ration indices respectively. These results also concur with the others of Hejazi, Lee, Lin and Choong (2010) who indicated that about 36 % of HIV patients had abdominal obesity when using waist circumference indice. Furthermore, these findings are almost the same as the results given by Jaime, Florindo, Latorre and Segurado (2006). They indicated that HIV patients treated with HAART, who had abdominal fat deposition, were 45.7% according to their waist-hip ratio.

The challenge in the current study lies in the fact that approximately 25% of the participants were classified as high risk, when using the BMI, WC and WHR. This highlights the point made by Jaime et al. (2006) that there is a need to reduce the metabolic risk and the risk for future chronic diseases. Furthermore, Petroczi, Hawkins, Jones and Naughton (2010)

conducted exercise sessions for people living with HIV/AIDS indicating that these people had a decreased weight, waist and hip sizes as well as an overall well-being.

The results of this study showed that the high prevalence of obesity was found more in women than men. Similar results were found by Jaime et al. (2006), Opara et al. (2007) and Hejazi, Lee, Lin and Choong (2010) that in HIV patients treated with HAART, women were more prone to become overweight/obese or having abdominal obesity than men. However, Salyer, Debra, Settle, Elswick and Rackley (2006) found opposite findings in which they reported that males had a higher waist-hip ratio than females.

The findings also revealed that the majority of the participants aged 55 years old and older were obese according to body mass index, waist circumference and waist hip-ratio respectively. This is supported by the findings that age is one of the significant factors to cause overweight and obesity (Hejazi, Soo Lee, Lin & Choong, 2010). These authors revealed that the respondents with obesity had a higher mean age. Moreover, Friis-Moller et al. (2003) reported that almost 25% of the study population aged above 55 years for women and 45 years for men were at high risk of developing cardiovascular diseases. There is evidence that overweight and obese patients treated with HAART were more exposed to Cardiovascular and diabetes diseases (Amorosa et al., 2005). This concern is therefore raised in the finding of this current study which revealed that the majority of the participants (72%) suffered heart diseases and diabetes with associated obesity.

The results of this study also indicated that the highest prevalence (45%) and (42%) of the participants classified into high risk category/ obese had 350 and more CD4 cell counts by using body mass index and waist circumference respectively. This is similar to the findings reported by various different studies that central obesity was higher in patients who had better peripheral CD4 counts (Jaime, Florindo, Latorre & Segurado, 2006; Friis-Moller et al., 2003).

Contrary, the findings of Bollens et al. (2001) found that excessive body fat accumulation is higher in HIV patients with current CD4 cell counts less than 100 c/ml. However, Petroczi et al. (2010) revealed that when people living with HIV/AIDS participate in physical activity, the increase of CD4 cell counts goes together with the reduction of weight, waist and hip sizes.

5.4. PHYSICAL ACTIVITY PARTICIPATION OF STUDY SAMPLE

Despite research suggesting that people with HIV infection, treated with HAART, might be receptive to make behavioral changes, especially physical activity participation (Salyer, Debra, Settle, Elswick & Rackley, 2006); Clingerman, 2004), it remains inadaptably lifestyle behavior. The results of the current study found that the highest prevalence (82.6%), (71%), (61.7%) and 75.2%) of participants did not meet the World Health Organization 2010 physical activity recommendation. These activities include leisure-time, household, walking to or from work, school, shopping, attending church and work related physical activities respectively. These findings are consistent with others which have found that the majority of HIV/AIDS subjects were inactive (Farah, Barbara, Nelson & Jorge, 2004). Conversely, Salyer, Debra, Settle, Elswick and Rackley, (2006) reported that majority (65.6%) of the HIV patients, treated with HAART, in USA were physically active. The difference in findings is not surprising if you compare the infrastructure, qualified personnel and follow up availability, compared to what is being done in underdeveloped countries like Rwanda.

This study revealed that the majority (82.6%) and (75%) of inactive participants were found in leisure-time and walking activity categories respectively. It totally opposes what is found by Clingerman (2004) in his/her study conducted in USA that 53% of the participants who participated in walking activity met 2010 WHO physical activity guidelines. The difference in results might be explained by the fact that HIV patients in developed countries probably

have more access to physical activity counseling than their counterparts who live in developing countries like Rwanda, who lack qualified personnel. By WHO (2006), people in developing countries use walking as the most common way to get around, because of poverty. It is therefore surprising that HIV patients treated with HAART in Rwanda, were inactive. The lack of transport means, should be served as the greatest opportunity to encourage these people to do more walking when going to church, shopping, school, visiting friends, etc. Being physically active would have positive effects.

In addition, Florindo, Latorre, Jaime & Segurado (2007) recommended walking and cycling as leisure activities for HIV patients, treated with HAART. This would increase their physical activity participation level which is needed to prevent inactivity complications and diseases. All these highlight the need and importance of an educational program and specific guidance for people living with HIV/AIDS, treated with HAART. Various types and intensity of physical activities is needed to integrate physical activity participation into their daily lives and promote health in general. It is evident that physical activity needs to be encouraged amongst this population. A study done by Kinsey, McVegh and Chantler (2008) highlighted the use of ARV medication, associated with higher CD4 cell counts and thus should be associated with increased physical activity. This will assist in a greater sense of functional independence among HIV patients.

5.5. BARRIERS TO PARTICIPATE IN PHYSICAL ACTIVITY

5.5.1. Barriers to participate in leisure-time physical activity.

The findings indicated that the first three limitations encountered by inactive participants were lack of motivation (27.3%), lack of time (22.8%) and fear of worsening of the disease (22.7%). The results were supported by the findings of Buchholz and Purath (2007) that majority of HIV patients reported a lack of motivation to be the most limiting factor for their

physical activity participation. This lower level of motivation can even be increased by physical activity participation itself, as reported by Petroczi, Hawkins, Jones and Naughton (2010). According to them, 80% of participants who lost motivation, regained it within two weeks of starting the exercise programme. Kolt and Snyder-Mackler (2003) reported that patients with chronic illness in general and HIV/AIDS in particular, often avoid physical activity participation for fear of making their condition worse or precipitate a hypoglycaemic event. These would probably be due to the lack of information by participants have, about the benefits of physical activity participation. Also the lack of knowledge for counseling about physical activity participation for people living with HIV/AIDS, together with poor follow up from the health professionals in charge on HIV patients, treated with HAART, in Rwanda as also highlighted by Douglas, Torrance, Teijlingen, Meloni and Ken (2006). Turk and Rudy (1991) revealed that people living with HIV, decided to have a sedentary life, by appraising their symptoms based on their self-knowledge. They made decisions regarding issues such as pain, symptoms, health beliefs and perceptions. It is unfortunate that physiotherapists who are more qualified about the benefits and implementation of physical activity were not involved at all in the follow up process of the HIV patients, treated with HAART, in Rwanda.

5.5.2. Barriers to participate in household physical activity.

The results of the current study showed that the common barrier encountered by participants for being physically inactive in household chores was due to having a domestic helper. These findings are similar to the study carried out by Kagwiza, Phillips and Struchers (2005). They reported that Rwandan women working in public and private institutions were physically inactive due to having a domestic helper. This was the most common barrier to participation in physical activity at home. It is common for most Rwandan families especially in towns like

Kigali, to employ domestic help to do their chores at home. Physical activity health promoters in Rwanda should encourage all people, even those living with HIV/AIDS, treated with HAART, in particular to get involved in housework activities.

5.6. FACTORS ASSOCIATED WITH PHYSICAL ACTIVITY PARTICIPATION AMONG PEOPLE LIVING WITH HIV/AIDS TREATED WITH HAART.

5.6.1. Age

Age has been reported by many studies to be one of demographic factors that influence physical activity behavior in adults consistently. The findings indicated that the highest prevalence of participants who were inactive in almost all types of physical activity, were aged between 35 and 54 years. This is similar to the findings of Miles (2007) who reported that young people are more active than adults in general. This could be explained by the fact that young people are more likely to participate in physical activities than older ones. Aging has been indicated to limit factor of physical activity participation (Friis et al., 2003). However, physical activity participation may slow the aging process (King & King 2010). According to Yang, Telama, Leino and Viikari (1999), physical activity participation should be encouraged in childhood and adolescence as a prerequisite of physical activity participation in adulthood. Adults should engage in more physical activity, including those with a chronic disease like HIV. They need to increase physical activity and create awareness about the benefits of it as early as childhood among the Rwandan population.

5.6.2. Gender

In this study, the findings show that the female participants were more inactive (85%) in leisure-time physical activity, compared to males (76%). This is similar to the study carried out by Barret, Plotnikoff, Cournaya & Raine (2007) that reported that mean MET-

minutes/week were much higher for males than females in the leisure-time physical activity. This might be explained by the fact that, culturally, Rwandan women spend almost all their time in household duties. Many of these are classified as light activities like preparing food, dish washing, care for their children, ironing, etc.

However, the findings showed that males are more physically inactive than females in household, walking and work related physical activities. These results are not supported by the findings found by Haase, Steptoe, Sallis & Wardle (2004) that lower level of physical activity participation are more dominant in women than men. Culturally, in Rwandan, women are considered to be responsible for all household activities. Some are classified as into moderate physical activities (eg. breaking firewood, carrying water, shopping for food or getting food from the garden ect).

5.6.3. Marital status

Eyler et al. (2002) reported that married people participated more in physical activity than those who are not. The results concur with the findings of this study that married HIV patients, treated with HAART, were more physically inactive in almost all types of physical activity (leisure-time, walking and work related physical activities) compared to unmarried people. It can probably be explained by the fact that most married couples are more concerned about family priorities during leisure-time, than exercising. In addition, married participants reported lacking time to exercise due to multiple family responsibilities (Friis et al., 2003).

5.6.4. Education levels

Many studies revealed that education level is one of the major contributing factors for physical activity participation (Orsini, Belloc, Bottai, Pagaro & Wolk, 2007). These authors

found that higher education level usually comes with more income, which affects negatively on physical activity participation. These concur with the results of this study, that found that the majority of participants with tertiary education level were inactive almost in all types of physical activities (household, walking and work related physical activities). This could be explained by the fact that people with high education level are more likely to drive, when going to workplace, shopping, visiting friends or going to church. Those of low income usually walk or cycle. Furthermore, people with high education level are more likely to have lighter or more sedentary jobs in contrast to those with low education level, who get heavier or more physically demanding jobs.

5.6.5. Occupation

One's occupation is an important factor for participation in physical activity. Clingerman (2004) reported a higher prevalence of active participants in employed HIV patients than unemployed. According to this author, this is due to, unemployed HIV people, having limited means to include in their activity of daily living, the required necessities for health promotion. Contrary, the findings of this study reported the highest inactivity level among employed HIV patients, treated with HAART, in public and private institutions. This could be related to the income generation as explained above. People working in public or private institutions mostly use modernized materials, like computers, instead of doing physically work, as those who are farming or having livestock.

5.6.6. CD4 cell counts

The findings of this current study indicated that the majority (88%, 86%, 89% and 86%) of the participants, accounting less than 200 CD4 cell counts per mm^3 , were physically inactive in all types of activities including leisure-time, household, walking, and work PA

respectively. This was not in accordance with the results given by Kinsey, Mcveigh and Caantler (2008) that found that HIV patients with the highest physical activity had scores, classified in the highest CD4 cell counts range. The inactivity of the participants in this current study, may be one of the reasons why these people have low levels of CD4 cells. Several researches proved that regular physical activity participation. Increased CD4 cell counts, regardless of initial stage of disease, level of CD4 cells or symptomatology (Petroczi et al., 2010; Souza, Jacob-Filho, Santarem, Silva, Li & Burattini, 2008). These authors also revealed that physical activity/ exercise participation is safe and beneficial for all stages of HIV disease. Moreover, Perna, LaPerriere, Klimas et al. (1999) revealed that the CD4 cell count of people living with HIV/AIDS who are physically active increased by 13%, whereas that of the inactive people living with HIV/AIDS decreased by 18%. Therefore, it will highly be advisable for them to actively participate in physical activities which will result in tremendous increase of their CD4 cells.

5.7. RELATION BETWEEN PHYSICAL ACTIVITY PARTICIPATION AND ANTHROPOMETRIC PROFILES

In regard to the body mass index (indicator for centralized distribution of adiposity), the findings indicated that the highest prevalence of obese participants (88%, (72%), 83% and 66% were inactive in all types of physical activity. This is in accordance with the results of Ramirez-Marrero, Smith, Melendez-Brau, Santana-Bagur (2004) that high BMI corresponded with physically inactive compared to physically active groups. According to Stewart, Neville, Bauman, Sallis and Wendy (2002), physically active people are approximately 50% less likely than those of sedentary lifestyle to be obese. Furthermore, the higher BMI (overweight/obese) at the start of HAART, medication accelerate the occurrence of abdominal obesity (Stewart, Neville, Bauman, Sallis & Wendy, 2002). Note that, it was

evidenced that abdominal obesity is much more risk for the development of cardiovascular diseases and diabetes than having generalized body fat distribution indicated by BMI test. In addition, being overweight and obese is found to be very strongly linked with cardiovascular diseases and type 2 diabetes mellitus (Amorosa et al., 2005). Furthermore, Lakoski, Barlow, Farrell, Berry, Morrow and Haskell (2011) revealed that high BMI is very significantly associated with cardio-respiratory dysfunctions.

In regard to the waist circumference (abdominal fat indicator), the results of the current study have shown that the highest prevalence of participants who were inactive in almost all types of physical activities (leisure-time, walking and work related activities) were classified into high risk category (having abdominal obesity). This is similar to the findings of a study carried out by Florindo et al. (2007) who found the higher level of central obesity to be more predominant in less active HIV people, compared with active counterparts. The central obesity of the participants was also assessed by using the waist-hip ratio. The results of this current study indicated that the highest prevalence of participants was inactive in all types of physical activity and found to be in a high risk category. This is in accordance to the findings of Domingo, Sambeat, Perez, Ordonez, Rodriguez and Vazquez (2003), who found in their study conducted in Spain that sedentary HIV patients, treated with HAART, had more increased waist-hip ratio compared to their active counterparts. Pouliot et al. (1994) reported that health is not only affected by how much body fat a person has, but also by where most of the fat is located on his/her body. It is evident that these inactive patients would not escape the associated fatal diseases such as diabetes, coronary heart disease and high pressure compromising the normal life (Pouliot et al., 1994). It is in this regard that the health promotion strategies aiming to increase the levels of physical activity participation need to be much more implemented, particularly for people living with HIV/AIDS, treated with HAART, in order to prevent these associated complications and improve their health status.

5.8. SELF-EVALUATION FOR PHYSICAL ACTIVITY PARTICIPATION REGARDING WHO RECOMMENDATIONS.

5.8.1. Participants' opinions about meeting WHO recommendations

The current study indicated that the majority of inactive participants in all types of physical activity thought that they met the WHO 2010 physical activity recommendations. It is alarming for these patients, who may lack clear and specific guidelines from health care professionals, to encourage and motivate their active participation (Steward, 2004). Furthermore, the prescription and participation of physical activity should rather be focused on, to stimulate the positive changes and promote general health of HIV patients, treated with HAART, as recommended by Colberg (2008). In addition, education programmes about the awareness and benefits of physical activity by all health promoters towards the HIV patients, treated with HAART, need to be planned and implemented.

5.8.2. Participants' views about meeting WHO recommendations

The results of the current study highlighted a need and desire from both active and inactive participants, to meet WHO 2010 physical activity recommendations. The findings were supported by the results published by Kagwiza, Phillips and Struchers (2005) that all women working in different institutions in Rwanda wished to be engaged and participate in physical activity as recommended by WHO. It is therefore encouraging and promising that positive benefits from physical activity could be achieved by HIV patients, treated with HAART, in Rwanda. It also challenges all health promoters who would conjugate their efforts to facilitate these patients achieving their wishes.

5.9. LIMITATIONS AND STRENGTHS OF THE STUDY

The results of the study should be interpreted in the light of the following limitations:

- The data was collected using a closed ended questionnaire which does not allow participants to freely express their feelings. Thus, it was not possible to determine the type of activity that Rwandan HIV patients prefer. This should be considered in future studies.
- The sample size was predominated by females, thus the results do not provide much information on males, side which makes them to be hardly generalized.
- Cross-sectional data may consistently describe patterns of association between variables, but it does not discover the cause. Then as it was focusing on abdominal fat location, the results may not be applicable to other patterns of morphological abnormalities resulting from the use of protease inhibitors, such as fat atrophy.
- The expected sample size was not achieved. This could be associated with the data collection process taking place December-January period. This could which probably explain the shortage in number of participants, since the majority of them would have gone on Christmas and New Year holidays (away from home).

Despite the limitations, the study had the following strengths:

- Every participant who was present on the same day as the researcher, participated in the study. Everyone had a chance to be involved in the study.
- The study used a questionnaire which was adapted from the original questionnaire. It was a validated and reliable study, to appropriately assess the physical activity levels and determine the anthropometric profiles associated with those levels in regards to the validity and reliability issues.
- The participants were very interested in participating in this study and completing the questionnaires. This is very positive because it gives hope of success for the future

investigations aiming at increasing and encouraging the participation in physical activity for people living with HIV/AIDS, treated with HAART, in Rwanda.

- The clients that participated in this study gave all the information required from them.

CHAPTER SIX: SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1. INTRODUCTION

This chapter provides a summary and conclusion of the study. The key findings of the study are highlighted. Finally, recommendations based on the study outcomes are provided at the end of this chapter.

6.2. SUMMARY AND CONCLUSION

The aim of this study was to determine the physical activity levels among people living with HIV/AIDS, treated with HAART, in Kigali, Rwanda. To achieve this, the levels and types of physical activities and anthropometric profiles were assessed and then contributing factors to physical inactivity, were identified.

The literature has focused on the prevalence of people living with HIV/AIDS, as well as those, treated with HAART in both developed and developing countries. Furthermore, it has shown that the accessibility to HAART is gradually increasing worldwide and even in Rwanda, where more than 70% of people get the therapy. It has evidenced by several scientific researchers that the use of HAART is associated with adverse effects, which are morphologic and metabolic changes. People who take HAART increase their weight generally up to the extent of obese/overweight or increasing abdominal girth (abdominal obesity) as result of accumulated fat into the abdomen level. These changes lead to development of cardiovascular diseases and diabetes. Physical activity participation was found to be the most important in the management of those complications from HAART. However, the literature has indicated that the majority of people living with HIV/AIDS,

treated with HAART, are not yet integrating physical activity participation into their daily lives.

Therefore, the researcher was very interested to determine the extent Rwandan people living in Kigali infected with HIV/AIDS, treated with HAART, were engaged in physical activity, as well as to encourage them to participate in it. The researcher was also interested to determine the severity of HAART complications through measuring anthropometric profiles of people living with HIV/AIDS, treated with HAART. The factors contributing to physical inactivity among these people were highlighted. The information gathered were hoped to contribute a lot, in setting and implementing of physical activity promotion strategies, aiming at the prevention and treatment of those complications from the use of HAART, among people living with HIV/AIDS.

The research settings were selected with three health centres located in Kigali, Rwanda. The descriptive quantitative study was used to describe the levels and types of physical activity participation, their relation with the socio-demographic and health related factors together with anthropometric profiles among people living with HIV/AIDS treated with HAART. The information was again gathered by means of cross sectional study within a period of two months. The accepted four hundred and seven (407) people living with HIV/AIDS, treated with HAART, participated in the study with respect of selection and exclusion criteria. The information needed, was obtained by the use of self-administered questionnaire composed with closed-ended questions. This questionnaire was adapted from a validated and reliable one. The pilot study was carried out to ensure its validity and reliability. The descriptive and inferential statistics were chosen to analyze the collected data. The descriptive statistics were used to summarize the physical activity levels, the anthropometric profiles as well as socio-demographic and health related factors. Inferential statistics were used to examine the

association between physical activity levels and anthropometric profiles together with those factors.

The participants were aged between 18 to 76 years with the mean age of 38.82 years. Females were higher (77%) than males (23%). Regarding marital status and education level, high numbers (54%) and (65%) of participants were married and educated up to primary level respectively. Furthermore, the majority (72%) of the participants had 350 and more CD4 cell counts which are adequate to engage into regular physical activity sufficiently.

With respect to the anthropometric profiles, approximately 40% participants were overweighted and obese, according to their BMI. 31% and 43% of them were found to have abdominal obesity, according to their waist circumference and waist hip ratio respectively. Moreover, females were much more at high risk of developing obesity as well as morphologic and metabolic changes when compared to males.

The levels and types of physical activity participation were examined using the Sub-Saharan African Activity Questionnaire that includes four types such as leisure-time, household, walking to work, school, shopping and/or to church and work related physical activities. The findings of the study indicated that the majority of the participants in all types live have sedentary lives. Furthermore, the leisure-time physical activity has been found to represent a higher prevalence (82.6%) of inactive participants than others. Fortunately, the majority of inactive participants in all types of physical activity participation reported that they wish to do physical activity at the same amount recommended by World Health Organization. Depending on participants' BMI, WC and WHR, the highest prevalence of inactive participants in almost all types of physical activities were obese. However, there was no statistical significant association found between anthropometric profiles and levels of almost all types of physical activity participation.

The main barriers to physical activity participation in leisure-time highlighted by participants were lack of motivation (30.5%), lack of time (25.3%) and fear of worsening of the diseases (24.3%). For household physical activity, the most common barriers reported by participants were having a domestic helper and children who can do the work.

The main and specific objectives of this study were achieved. It is evident that the participants' levels of physical activity participation are not adequate considering the WHO 2010 PA guidelines for preventing the development of morphologic and metabolic complications due to HAART. In addition, there are a big number of people living with HIV, treated with HAART, who had abdominal obesity as a consequence of taking HAART. These findings were similar to the various studies conducted in developed and developing countries. Therefore, there is a need to implement health promotion programmes in order to increase physical activity participation worldwide, particularly for Rwandan people, living with HIV/AIDS treated with HAART.

6.3. RECOMMENDATIONS

- It has been evidenced by several scientific studies that regular physical activity participation plays an important role in the prevention and management of morphologic and metabolic complications due to HAART (Amorosa et al., 2005). There is a need therefore for Rwandan health promoters to emphasize the motivation of people living with HIV/AIDS, treated with HAART, to increase their levels of physical activity participation. This needs to be done together with facilitating HIV persons on how they can manage their time and minimize their fear. These were the main barriers to physical activity participation for them.
- Physiotherapists should be involved in counselling sessions, which are usually provided during patient's routine visits. These should not be only for rehabilitation

after complications in order to provide guidelines and advices on the type and intensity of physical activity required by people living with HAART, with regards to their individual needs and health status.

- In Rwanda radios are the most popular media form. Radio broadcasts, concerning physical activity participation among people living with HIV/AIDS needs to be started in order to encourage people to integrate physical activity participation into their daily lives.
- The delivered education campaigns to encourage people to increase their level of physical activity participation should also emphasize the benefits of physical activity for people living with HIV/AIDS treated with HAART.
- The health providers and community health workers should be aware about the PA guidelines for people living with HIV infection and its benefits. When they meet these people, they should encourage them to participate into regular physical activities/exercises or refer them to the qualified exercise therapists, like physiotherapists.
- People, (including people living with HIV/AIDS) should at their workplaces be facilitated on how they can initiate and increase physical activity participation through enjoyment, at work.
- The local sport clubs with the qualified physical therapists need to be initiated, so that they conduct the supervised exercises for people living with HIV/AIDS, who need special guidance.
- Healthy lifestyles, especially physical activity participation, should be educated at an early childhood, like at primary school level so as to gain the benefits of physical activities at a young age. This could promote the participation in physical activities at

adulthood. The Ministry of Education should put into action this recommendation that would promote physical activity participation behaviour in schools.

- The Ministry of Health should put in place policies and programmes that encourage people to avoid sedentary lifestyles. This would help to prevent the non-communicable diseases in general and morphologic and metabolic changes resulted in HIV patients, treated with HAART, in particular.
- The government should increase the accessibility and availability of physical-activity and fitness facilities to people living with HIV/AIDS, treated with HAART. They could arrange corporate memberships or negotiate the reduction of fees for local health clubs and facilities.
- The future studies concerning the knowledge of physical activity guidelines among health care providers should be done. This could indicate if people living with HIV/AIDS, get enough and appropriate guidance from health providers.

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APPENDIX A

QUESTIONNAIRE: PEOPLE LIVING WITH HIV/AIDS TREATED WITH HAART.

We are conducting a study to determine the physical activity levels among people living with HIV/AIDS treated with HAART in Rwanda. You have been chosen to be part of the study and your contribution in filling in this questionnaire will be very important in order to improve the quality of life of people living with HIV/AIDS in Rwanda. The information provided will be treated confidentially and your consent is paramount.

NOTE:

Please do not write your name on the questionnaire. Select one or more response by using a tick in the box near your choice.

A. PERSONAL INFORMATION

How old are you? (In years).

Are you a female or male? 1. Female

2. Male

3. What is your marital status?

1. Single 3. Widower

2. Married 4. Divorced

4. What is your highest level of Education?

1. No school attended 3. Secondary

2. Primary 4. Tertiary

5. What is your occupation?

- 1. Working in public/private service
- 2. Self-employed
- 3. Farming or livestock
- 5. Unemployed
- 6. Other.....

6. For how long have you been on HAART?

- 1. Only 1 year
- 2. 2-3 years
- 3. 4-5 years
- 4. 6 years and above

7. Do you have any opportunistic disease(s)?

- 1. Pulmonary disease
- 2. Neuropathic disease
- 3. Diarrhea
- 4. Heart diseases
- 5. Diabetes
- 6. Other.....

8. CD4+ cells counts...../mm3

B. ANTHROPOMETRIC PROFILES

ANTHROPOMETRIC PROFILES	1st	2nd	Average
Weight			
Height			
Body mass index			
Waist circumference			
Hip circumference			
Waist-to-hip ratio			

SECTION C:

INSTRUCTIONS

Section B asks about the time you spend doing different types of physical activity. This includes activities you do at work, walking to and from work, shopping, school and church and activities you do at home and during your leisure-time or spare time. You are requested to answer all the questions.

PART I: LEISURE OR SPARE TIME PHYSICAL ACTIVITY

The questions below ask about activities you do in your leisure or spare time. While answering, think back to your recently days, then consider a usual/typical week.

1. In your leisure time or spare time, do you participate in vigorous physical activities like (running, jogging, basketball, soccer, volleyball, aerobic dancing, vigorous traditional dance etc...)?

Yes: No:

1a. If yes state the number of days per week:

1b. The average duration of the session.....Min/ session

2. In your leisure or spare time, do you participate in moderate activities like (brisk walking, swimming, classic dance, moderate gymnastic, table tennis etc...)?

Yes: No:

2a. If yes states the number of days per week:

2b. The average duration of the session:Min/ Session

3. In your leisure time or spare time, do you participate mostly in sitting activities like (watching TV, listening to radio, playing table game such as cards, scrabble etc....) or in light activities like (driving car, light walking etc...)

Yes:

No:

3a. If yes state the number of days per week:

3b. The average duration of the session.....Min/Session

4. Do any of the following prevent you from participating (on most days of the week) in any kind of leisure time moderate and vigorous physical activity, such as described in (1) and (2) above (Tick (V) one or more answers)

Lack of facilities (such sidewalks, playgrounds,

Fitness facilities etc...)

Lack of time

Lack of motivation

Cost transport

Lack and cost sport equipment

Culture barrier (such as wearing a short)

Lack of family support

Have health problem

Fear of worsening of the disease

Lack of counseling

Other limitations (please specify).....

PART II: HOUSEHOLD ACTIVITIES

The following questions ask about physical activities you do at home. When answering, think back then consider a usual/typical week.

1. Usually while you are at home, do you participate in vigorous activities like (chopping wood, digging, carrying water etc...)

Yes: No:

1a. If yes state the number of days per week.....

1b. The average duration of the sessionMin/Session

2. Usually while you are at home, do you participate in moderate activities like (cleaning house, washing clothes with hands, washing windows/bathrooms, gardening, sweeping pavement etc...)

Yes: No:

2a. if yes state the number of days per week.....

2b. The average duration of the session.....Min/Session

3. Usually when you are at home, do you participate mostly in sitting activities like (plaiting hair, chatting with people, helping children doing homework etc...) or in light activities like(dish washing, preparing food, ironing, care for children, personal care etc...)

Yes: No:

3a. If yes state the number of days per week.....

3b. The average duration of the session.....

4. If you do not participate (on most days of the week) in any kind of moderate household physical activity, what could be the reasons? (Tick (V) one or more answers)

Don't have time:

Tired after work:

Have domestic help:

Have children who can do the work:

Have relatives who can do the work:

Other reasons (specify).....

PART III: WALKING TO AND FROM WORK, SHOPPING, SCHOOL OR CHURCH

1. Do you usually walk from home to your place (even for a part of the way)?

Yes: No:

1.a. If yes, how many minutes do you take to walk?

1.b. How many times per week do you walk from home to your place?

1.c. How do you normally walk?

Slow pace Brisk pace

2. Do you usually walk from your place to home (even for a part of the way)?

Yes: No:

2.a. If yes, how many minutes do you take to walk?

2.b. How many times per week do you walk from your place to home?

2.c. How do you normally walk?

Slow pace: Brisk pace:

PART IV: OCCUPATION-RELATED PHYSICAL ACTIVITY

1. How many days do you work per week?

Please when answering the below questions, think about your usual/typical workday, while at work. Estimate all the activities performed during that usual/typical workday (including the lunch break) and the average duration.

2. During your working day, do you participate in vigorous activities, like (moving furniture/heavy boxes, heavy lifting etc...)?

Yes: No:

If yes, state for how long (Min/Hours):

3. During your working day, do you participate in moderate activities like (cleaning, sweeping pavement, washing windows, gardening etc...)

Yes: No:

If yes, state for how long (Min/Hours).....

4. During your working day, do you participate mostly in sitting activities like (writing, discussion (meeting), desk-work or light activities like (carrying light load, walking on a level, climbing stairs, etc...)?

Yes: No:

If yes, state for how long (Min/Hours).....

PART V: PERSONAL EVALUATION OF PHYSICAL ACTIVITY

The world health organization has recommended for every adult to engage in at least 30 minutes of physical activity of moderate intensity, every day or on most days of the week, in order to obtain health benefits.

1. Do you think you meet those guidelines?

Yes: No:

2. Would you like to do (more, less, the same, don't know)

More:

Less:

The same:

Don't know:

THANK YOU!

APPENDIX B

IGIKA CYA MBERE: IBIJYANYE N' IMIBEREHO N' UKO UBUZIMA BUHAGAZE BW' ABARWAYI.

AMABWIRIZA

Subiza ibibazo byose

Shyira akamenyetso ka (V) ku gisubizo kimwe cyangwa se byinshi ku mwanya wateganyijwe.

Tanga ibisubizo byanditse mu mwanya wateganyijwe

1. Ufite imyaka ingahe?

Subiza kuri ibi bikurikira

2. **Igitsina:** Gore

Gabo

3. **Ingaragu**

Mbana n' uwo twashakanye

Natandukanye nuwo twashakanye

Umupfakazi

4. Amashuri wize ni ingahe?

Ntabwo nigeze niga

Amashuri abanza

Amashuri yisumbuye

Kaminuza

5. Ni uwuhe mwuga wawe?

Ukozi wa Leta/ikigo kigenga

Ndikorera

Umucuruzi

Ntakazi ngira

Nkora ibiraka

Ikindi

6. Umaze igihe kingana iki ufata imiti igabanya ubukana bw' agakoko gatera SIDA

Umwaka 1 gusa

Kuva ku mwaka 2 – 3

Kuva ku myaka 4 – 5

Imyaka 6 kujyana hejuru

7. Ni iyihe ndwara yicyuririzi urwaye

Igituntu

Mugiga

Gucibwamo

Uburwayi bw' imitsi

Indi ndwara

8. Abasirikare bo mu mubiri ni/ mm³

**B. Ibipimo byerekana ko ushobora kurwara indwara ziterwa no kudakora imirimo
ntakazangufu**

Ibipimo	Bwa mbere	Bwa kabiri	Impuzandengo
Uburemere			
Uburebure			
Uburemere/uburebure bwikubye kabiri			
Umuzenguruko wo munda			
Umuzenguruko wo ku matak			
Umuzenguruko wo munda/uwo ku matak			

IGIKA CYA KABIRI

Amabwiriza

Iki gika cyerekeye ku gihe ukoresha mu mirimo ntakazangufu inyuranye. Muri icyo mirimo harimo icyo ukorera ku kazi, kujya no kuva ku kazi, imirimo mukora mu rugo, no mu gihe mutari ku kazi (mu gihe cyo kwishimisha / Kwidagadura).

IGICE CYA MBERE: Imirimo ntakazangufu ikorwa mu gihe kitari icy’ akazi cg icyo kwidagadura.

Ibibazo bikurikira bijyanye n’ imirimo ukora mu gihe kitari icy’ akazi no kwishimisha. Mu gusubiza utekereze ku minsi ishize, ufate icyumweru gisanzwe ho urugero.

1. Mugihe cyawe cyo kwishimisha cyangwa se kitari icy’ akazi ukora imirimo ntakazangufu ikaze nka basikete, vole, umupira w’ amaguru, imyitozo ngororamubiri, kwirukanka cg kubyina imbyino nyarwanda?

Yego Oya

1.a. Niba aribyo, uyikora iminsi ingahe mu cyumweru?inshuro.

1.b. Ugereranyije ukoresha igihe kingana iki buri nshuro? Iminota Ku nshuro.

2. Mugihe cyawe cyo kwishimisha cyangwa se kitari icy’ akazi, ukora imirimo ntakazangufu igereranyije (nko kugenda wihuta, koga mu mazi menshi, kubyina bisanzwe, n’ imyitozo igereranyije nka tenisi yo kumeza, n’ ibindi.....).

Yego Oya

2.a. Niba aribyo, uyikora iminsi ingahe mu cyumweru?

2.b. Ugereranyije ukoresha igihe kingana iki buri nshuro? Iminota kunshuro

3. Mu gihe cyanyu cyo kwishimisha cyangwa se kitari icy' akazi, cyane cyane uba wicaye (nko kuba ureba televiziyo, kumva radiyo, gukina imikino yo kumeza nk' amakarita, n' ibindi...) cyangwa se imirimo yoroheje (nko gutwara imodoka, kugenda buhoro, n' ibindi...)?

Yego

Oya

3.a. Niba aribyo, ubikora iminsi ingahe mu cyumweru?.....

3.b. Ugereranyije ukoresha igihe kingana iki buri nshuro? Iminota kunshuro.

4. Mubintu bikurikira hari ikikubuzwa gukora imirimo ntakazangufu, igereranyije mugihe runaka cyo kwishimisha nk' ibyavuzwe haruguru kuri (1) no kuri (2). (Shyira akamenyetso ka (V) ku gisubizo kimwe cyangwa byinshi).

-Kubura ibikorohereza (ibibuga by' imikino bidahari, uburyo bwo

gukora imikino Ngororangingo, inzira y' abanyamaguru, n' ibindi ...)

-Kubura igihe

-Kubura ubushobozi cg inkunga

-Kugera aho nakorera bisaba tike kandi sinayobona

-Kubura ibikoresho bya siporo

-Imbogamizi y' umuco (nko kutambara ibigufi/gusekwa)

-Kutabishishikarizwa n' umuryango

-Kumva buri gihe ntambaraga ufite

-Kugira ubwoba ko byakongera ubukana bw' ubwandu

-Kuba ntanama wahawe igushikariza gukora imirimo ntakazangufu

-Izindi mbogamizi (Zivuge muri make)

IGIKA CYA KABIRI: Imirimo yo mu rugo

Ibibazo bikurikira bijyanye n' ibyo mukora mu rugo. Mu gusubiza mutekereze ku minsi ishize, mufate icyumweru gisanzwe ho urugero.

1. Ubusanzwe iyo uri mu rugo, hari imirimo ikomeye ukora (nko kwasa inkwi, guhinga, kuvoma, n' ibindi

Yego

Oya

1.a. Niba aribyo, uyikora iminsi ingahe mu cyumweru?

1.b. Ugereranyije ukoresha igihe kingana iki buri nshuro? Iminota Kunshuro

2. Ubusanzwe iyo muri mu rugo, ukora imirimo yoroheje (nko gusukura inzu, kumesha n' intoki, koza amadirishya/urwiyuhagiriro, gukora mu busitani, gukubura imbuga, n' ibindi

Yego

Oya

2.a. Niba aribyo, uyikora iminsi ingahe mu cyumweru?

2.b. Ugereranyije ukoresha igihe kingana iki buri nshuro? Iminotakunshuro

3. Ubusanzwe iyo uri murugo, akenshi ukora imirimo isaba kwicara (nko gutunganya imisatsi, kuganira, gufasha abana gukora imikoro n' ibindi ...) cyangwa n' imirimo yoroheje (nko koza ibikoresho byo mu gikoni, gutera ipasi, guteka, kwita kubana no kwiyitaho).

Yego

Oya

3.a. Niba aribyo, uyikora iminsi ingahe mu cyumweru?

3.b. Ugereranyije ukoresha igihe kingana iki buri nshuro? Iminotakunshuro

4. Niba ntamurimo n' umwe ntakazangufu ukase cg ugereranyije ukora, biterwa n' iki? (Shyira akamenyetso ka (V) ku gisubizo kimwe cyangwa byinshi).

- Kubura igihe

- Kunanirwa nyuma y' akazi

- Kugira umukozi wo mu rugo ubikora

- Kugira abana bashobora kubikora

- Kugira abavandimwe bashobora kubikora

- Izindi mpamvu

IGICE CYA GATATU: Kujya no kuva ku kazi, ku isoko, ishuri cg urusengero

Iyo ujjayo ugenda n' amaguru? (niyo byaba ari agace k' urugendo)

Yego

Oya

1.a. Niba aribyo, ukoresha igihe kingana iki ugenda n' amaguru? Iminota.....

1.b. ugenda kangaha mu cyumweru?

1.c. Ubundi ugenda kubuhe buryo?

- Buhoro

- Nihuta

2. Iyo uvayo ugenda n' amaguru?

Yego

Oya

2.a. Niba aribyo, ukoresha igihe kingana iki ugenda n' amaguru?

2.b. Kugenda cg kuvayo ubikora kangaha mu cyumweru?

2.c. Ubundi ugenda ubuhe buryo?

Buhoro

Nihuta

IGIKA CYA KANE: Imirimo ntakazangufu ijyanye n' akazi

Ukora iminsi ingaha mu cyumweru?

Mu gusubiza ibibazo bikurikira, utekereze k' umunsi ushize, ufate umunsi usanzwe ho urugero uri ku kazi, gereranya imirimo yose ukora kuri uwo munsi (ushyizemo n' igihe cyo kuruhuka cya saa sita) n' igihe imara

1. Mu gihe cyawe cy' akazi, ukora imirimo y' ingufu (nko guterura ibikoresho biremereye, n' ibindi)?

Yego

Oya

2.a. Niba aribyo bigufata igihe kingana iki? Iminota....., amasaha

3. Mu gihe cyawe cy' akazi, ukora imirimo yoroheje (nko gukora isuku, gukubura imbuga, koza amadirishya, gukora mu busitani, n' ibindi)?

Yego

Oya

3.a. Niba aribyo, bigutwara igihe kingana iki? Iminota, amasaha

4. Mu gihe cyawe cy' akazi, ukora imirimo wicaye (nko kwandika, ibiganiro mpaka, akazi ko mubiro) cyangwa imirimo yoroheje (nko guterura ibintu bitaremereye, kugenda ahantu haringaniye, kuzamuka esikariye, n' ibindi)?

Yego

Oya

4.a. Niba aribyo, bigutwara igihe kingana iki? Iminota, amasaha

IGICE CYA GATANU: Igenzura bwite ry' imirimo ntakazangufu

Umuryango mpuzamahanga wita k' ubuzima, wasabye buri muntu wese ukunze gukora imirimo ntakazangufu ko yayikora ku buryo buringaniye mu gihe byibura cy' iminota 30 buri muni, iminsi itanu se cyangwa irenzeho mu cyumweru, kuko bitera kugira ubuzima bwiza.

1. utekereza ko wubahiriza ayo mabwiriza?

Yego

Oya

Wowe se wumva wakora ute?

Birenze

Munsi yaho

Nkibyateganyijwe

Simbizi

MURAKOZE CYANE.

APPENDIX C

**OFFICE OF THE DEAN
DEPARTMENT OF RESEARCH
DEVELOPMENT**

Private Bag X17, Bellville 7535
South Africa
Telegraph: UNIBELL
Telephone: +27 21 959-2948/2949
Fax: +27 21 959-3170
Website: www.uwc.ac.za

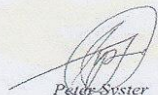
5 October 2010

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape has approved the methodology and the ethics of the following research project by:
Mr. A Murenzi (Physiotherapy)

Research Project: Physical activity levels among people living with HIV/AIDS treated with High Active Antiretroviral Therapy in Rwanda

Registration no: 10/8/15



Peter Syster
Manager: Research Development Office
University of the Western Cape



UNIVERSITY of the
WESTERN CAPE

A place of quality, a place to grow, from hope to action through knowledge

APPENDIX D

REPUBLIC OF RWANDA/REPUBLIQUE DU RWANDA



NATIONAL ETHICS COMMITTEE / COMITE NATIONAL D'ETHIQUE

Telephone: (250) 55 10 78 84

E-mail: r nec@moh.gov.rw

Web site: www.r nec.moh.gov.rw

Ministry of Health
P.O. Box. 84
Kigali, Rwanda.

FWA Assurance No. 00001973
IRB 00001497 of IORG0001100

No. 309/ RNEC /2010
November 17, 2010

Augustin MURENZI
Principal Investigator

Your Project title: **Physical activity levels among people living with HIV/AIDS treated with high active antiretroviral therapy in Rwanda;** has been evaluated by the Rwanda National Ethics Committee.

Name	Institute	Involve in the decision		
		Yes	No (Reason)	
			Absent	Withdrawn from the proceeding
Dr. Justin Wane	King Faisal Hospital, Kigali HOD Laboratory	X		
Prof. Emmanuel Bajyana	Immunologist, faculty of sciences (NUR)	X		
Dr. Emmanuel Nkeramihigo	Senior Lecturer, National University of Rwanda. Faculty of Medicine	X		
Dr. Dariya Mukamusoni	Director of Nyamata Hospital	X		
Dr Juliet Mbabazi	King Faisal Hospital, Kigali Ag. Chief Executive Officer	X		

Prof. Alexandre Lyambabaje	National University of Rwanda		X	
Mrs. Françoise Uwingabiye	Lawyer Musanze	X		
Dr. Eugène Rutembesa	National University of Rwanda	X		
Sr. Domitilla Mukantabana	Kabgayi Nursing and Midwife school		X	

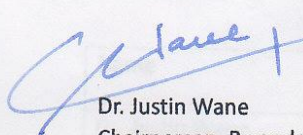
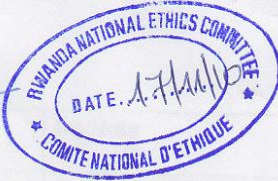
After reviewing your protocol during the RNEC meeting of 13th November 2010, where the quorum was met, the following comments were made:

- List of abbreviations and explanation
- To provide CV of Principal Investigator
- On Informed Consent form: Please add that if you have a question about your rights as a researcher subject you should contact Dr Justin wane, Chairperson of the Ethics Committee at 0788500499, or Dr Emmanuel Nkeramihigo secretary of the Rwanda National Ethics Committee at 0788557273.
- To provide Kinyarwanda questionnaire

Decision: Approval Pending.

After all corrections please submit an updated protocol (1 copy of revised protocol) to the office of Rwanda National Ethics Committee.

Sincerely,



 Dr. Justin Wane
 Chairperson, Rwanda National Ethics Committee.

C.C.

- Hon. Minister of Health.
- The Permanent Secretary, Ministry of Health

APPENDIX E



Kigali le 15/12/2010

Objet: Autorisation de
mener une étude.

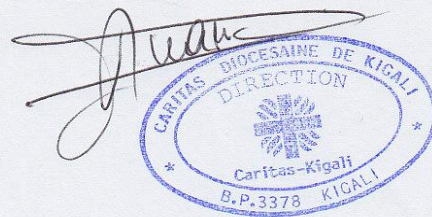
A Monsieur MURENZI Augustin

Monsieur;

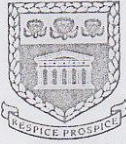
Référence faite à votre lettre du 1/12/2010
dont l'objet consistait à demander une autorisation de mener une étude intitulée : physical activity levels among people living with HIV/AIDS treated with high Active Antiretroviral Therapy in Rwanda, dans le Centre de Santé de KICUKIRO, nous avons le plaisir de vous informer qu'en accord avec la Sœur Titulaire du Centre cette autorisation vous est accordée avec bienveillance, et vous souhaitons à l'occasion un travail fructueux.

CPI :
-Sœur Titulaire du Centre de Santé
de KICUKIRO

Abbé Anaclel MWUMVANEZA
Directeur de la CARITAS
Archidiocèse de Kigali



APPENDIX F



UNIVERSITY of the
WESTERN CAPE

Private Bag X17, Bellville 7535, South Africa
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Website: www.uwc.ac.za

DEPARTMENT OF PHYSIOTHERAPY
UNIVERSITY OF THE WESTERN CAPE
FACULTY OF COMMUNITY AND HEALTH SCIENCES
DEPARTMENT OF PHYSIOTHERAPY



15 August 2010

The Head of Health Center,

of P.S. Jhoro - Social Health Centre of Bihyo Go

Dear Madam/ Sir,

Re: Permission to conduct a research study

I am a Rwandan postgraduate student enrolled in the Physiotherapy (Masters) program at the University of the Western Cape – South Africa. I am expected to conduct research as part of the requirement for a Masters Degree in Physiotherapy. The title of my study is " Physical activity levels among people living with HIV/AIDS treated with High Active Antiretroviral Therapy in Rwanda".

I hereby request your permission to carry out the above-mentioned study in your Health Center, among people living with HIV/AIDS treated with HAART.

It is hoped that the results of this study will be helpful in planning effective health promotion programmes for HIV patients treated with HAART in Rwanda. These health promotion programmes will be in line with the recommendations of WHO to all its Members States, as a global strategy, which stated that physical activity should be used to address the growing burden of chronic diseases resulted as complications of HAART. It would be very grateful if you would allow me to carry out the study during September and October 2010.

Participation in this study will be anonymous and voluntary and the information gathered will be treated with respect and confidentiality.
Hoping for your positive response.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Augustin Murenzi', with a long horizontal stroke extending to the left.

Augustin Murenzi

Supervisor: Prof. José Merle Frantz

APPENDIX G



UNIVERSITY of the
WESTERN CAPE

Private Bag X17, Bellville 7535, South Africa
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Website: www.uwc.ac.za

DEPARTMENT OF PHYSIOTHERAPY
UNIVERSITY OF THE WESTERN CAPE
FACULTY OF COMMUNITY AND HEALTH SCIENCES
DEPARTMENT OF PHYSIOTHERAPY

15 August 2010
The Head of Health Center,
J. KIMIRONKO.....
Dear Madam/ Sir,

Re: **Permission to conduct a research study**

I am a Rwandan postgraduate student enrolled in the Physiotherapy (Masters) program at the University of the Western Cape – South Africa. I am expected to conduct research as part of the requirement for a Masters Degree in Physiotherapy. The title of my study is " **Physical activity levels among people living with HIV/AIDS treated with High Active Antiretroviral Therapy in Rwanda**".

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It would be very grateful if you would allow me to carry out the study during September and October 2010.

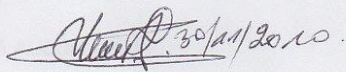
ok
you are allowed to do project
Ngwenyane

A place of
a place to grow from
to action through know

Participation in this study will be anonymous and voluntary and the information gathered will be treated with respect and confidentiality.

Hoping for your positive response.

Sincerely,

 30/01/2010

Augustin Murenzi

Supervisor: Prof. José Merle Frantz

Dear Madam Sir,

Re: Permission to conduct a research study

I am a Rwandan postgraduate student enrolled in the Physiotherapy (Masters) program at the University of the Western Cape – South Africa. I am expected to conduct research as part of the requirements for Masters Degree in Physiotherapy. The title of my study is "Physical activity levels among people living with HIV/AIDS treated with High Active Antiretroviral Therapy in Rwanda".

I hereby request your permission to carry out the above-mentioned study in your Health Center, among people living with HIV/AIDS treated with HAART.

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It would be very grateful if you would allow me to carry out the study during September and October 2010.

APPENDIX H



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592524, Fax: 27 21-9591217

E-mail: mwarner@uwc.ac.za

INFORMATION SHEET

Project Title: *Levels of physical activity participation among people living with HIV/AIDS treated with HAART in Kigali, Rwanda.*

What is this study about?

This is a research project being conducted by Mr. Augustin MURENZI at the University of the Western Cape. We are inviting you to participate in this research project because you are a person living with HIV/AIDS treated with HAART and at risks of developing morphologic and metabolic changes which are prevented or managed with participating into physical activity. The purpose of this research project is to determine the levels and types of physical activity participation among people living with HIV/AIDS treated with HAART in Kigali, Rwanda.

What will I be asked to do if I agree to participate?

You will be asked to provide a signed consent letter to participate in this study. You will have to answer all questions of the questionnaire. You will be approached at your Health Centre to complete the questionnaire when waiting to be given your medications and giving it back to the researcher. You will deserve the right to withdraw from this study at any time and the right to ask for more clarification on the study. In addition, anthropometric measurements will be measured by the researcher. The information you provide will be kept confidentially and the feedback will be made available to you after the completion of this study.

Would my participation in this study be kept confidential?

We will do our best to keep your personal information confidential. To help protect your confidentiality, do not indicate your names and/or other identifiable details. Only the codes will be used on the data forms. Through the use of an identification key, the researcher will be able to link your survey to your identity and only the researcher will have access to the identification key.

What are the risks of this research?

There are no predicted risks associated with participating in this research study.

What are the benefits of this research?

This research is not designed to help you personally, but the results will help the people living with HIV/AIDS treated with HAART in general, health promoters for physical activity, medical practitioners and researcher to learn more about health promotion strategies for physical activity participation to prevent and manage the complications resulted from the use of HAART as well as improving your quality of life.

Do I have to be in this research and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

What if I have questions?

This research is being conducted by *Mr. Augustin MURENZI, a registered student in Physiotherapy Department at University of the Western Cape*. If you have any questions about the research study itself, please contact Mr. Augustin MURENZI on telephone number 0788607641, email: murenzi55@yahoo.fr or 2975006@uwc.ac.za

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Head of Department: Prof. Julie Phillips

Dean of the Faculty of Community and Health Sciences: Prof Ratie Mpofu

University of the Western Cape

Private Bag X17

Bellville 7535

This research has been approved by the University of the Western Cape's Senate Research Committee and Ethics Committee.

APPENDIX I



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592524, Fax: 27 21-9591217

E-mail: mwarner@uwc.ac.za

IBISOBANURIRWA UBAZWA

Ubushakashatsi: IBIJYANYE NO GUTEZA IMBERE IMIRIMO NTAKAZANGUFU MU BAFATA IMITI IGABANYUBUKANA BW' AGAKOKO GATERA SIDA MU RWANDA.

Ubu bushakashatsi bugamije iki?

Ubu bushakashatsi bukozwe na AUGUSTIN MURENZI, wiga muri Kaminuza ya Western Cape muri Afurika y'epfo. Wahamagajwe muri ubu bushakashatsi kubera ko ukora ufata imiti igabanya ubukana bw' agakoko gatera SIDA. Intego y'ubu bushakashatsi ni ugukangurira abantu gukora imirimo ntakazangufu mu Rwanda.

Nzasabwa gukora iki, igihe nemeye kubazwa?

Urasabwa gusubiza ibibazo uri buze guhabwa no gufatwa ibipimo by' umubyibuho. Ibi bizafasha gusubiza intego z'ubushakatsi bwanjye kandi bikazamfasha na none gushyira ahagaragara ibikenewe birebana no kwitabira guteza imbere imyitozo ngororamubiri mu buzima bwanyu bwa buri muni. Uraza guhabwa ibyo bibazo ubisubize mu mwanya ukwiriye, nurangiza ubisubize umushakashatsi, nawe agufate ibipimo bisesengura ingano y' ibinure ufite mu mubiri, aribyo: ibiro, uburebure, umuzenguruko wo munda n' uwo ku matak.

Ese ibisubizo ndibutange bizagirwa ibanga ki?

Ibisubizo byose utanga bizagirwa ibanga. Kugira ngo bishoboke, usabwe kutandika amazina yawe ku rutonde rw'ibibazo. Aho hose kandi nta makuru yerekana uwo wowe bwite uriwe.

Nta ngaruka se nagira nitabiriye ubu bushakashatsi?

Nta ngaruka nimwe izwi ijyanye n'ubu bushakashatsi.

Ni izihe nyungu se ziri muri ubu bushakashatsi?

Ubu bushakashatsi ntibwagennye gufasha wowe gusa, ibisubizo by'ubu bushakashatsi bizafasha abagenabikorwa hamwe n'umushakashatsi kwiga birushijeho ibyerekeranye no guteza imbere imirimo ntakazangufu muri Rwanda. Turizera kandi ko mugihe gitaha abandi

bantu bazagira inyungu zivuye kuri ubu bushakashatsi bivuye ku myumvire iteye imbere ku kamaro k'imirimu ntakazangufu mu kuvura no kurinda ingaruka ziterwa n' imiti igabanya ubukana bw' agakoko gatera SIDA.

Ese nemeye kwitabira ubu bushakashatsi nshobora kwivanamo igihe cyose mbishakiye?

Kwemera kuja muri ubu bushakashatsi ni ubushake bwawe busesuye. Ushobora kwemera cyangwa kutemera kubwitabira. Wemerewe kwivana muri ubu bushakashatsi igihe cyose, nta nkurikizi cyangwa ngo utakaze inyungu iyo ariyo yose wakagombye kubona muri ubu bushakashatsi.

Ndamutse se nshatse kugira icyo nasobanura nyuma y'ubu bushakashatsi nakwiyambaza nde?

Ubu bushakashatsi burimo gukorwa na AUGUSTIN MURENZI wiga muri Kaminuza ya Western Cape muri Afurika y'epfo. Hagize ikibazo wakwifuza kubaza kirebana n'ubu bushakashatsi, wakwiyambaza AUGUSTIN MURENZI kuri numero ya telefoni 0788607641 e-mail: murenzi55@yahoo.fr

Ugize ikibazo kirebana n'ubu bushakashatsi ni uburenganzira bwawe nk'ubazwa, cyangwa ushatse kumenyekanisha ibibazo wagize birebana n'ubu bushakashatsi, wabimenyesha:

Uhagarariye ishami rya Physiotherapy: Professor Julie Phillips

Umuyobozi wa Faculty of Community and Health Sciences: Professor Ratie Mpofu

Kaminuza ya Western Cape

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592542, Fax: 27 21-9591217

E-mail: mwarner@uwc.ac.za

Ubu bushakashatsi bwemejwe na Kaminuza ya Western Cape's Senate Research Committee and Ethics Committee.

APPENDIX J



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592524, Fax: 27 21-9591217

E-mail: mwarner@uwc.ac.za

CONSENT FORM

Title of Research Project: Levels of physical activity participation among people living with HIV/AIDS treated with HAART in Kigali, Rwanda.

The study has been described to me in language that I understand and I freely and voluntarily agree to participate. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.

Participant's name.....

Participant's signature.....

Date.....

Witness' name.....

Witness' signature.....

Date.....

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact Dr Justin Wane, Chairperson of Rwanda National Ethics Committee at (+250)788500499, or Dr Emmanuel Nkeramihigo, secretary of the Rwanda National Ethics Committee at (+250)788557273

Study Coordinator's Name: Mr. Augustin MURENZI

Cell:+27(0)837216173 in South Africa or +250(0)788607641 in Rwanda

Email: murenzi55@yahoo.fr/2975006@uwc.ac.za

APPENDEX K



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592524, Fax: 27 21-9591217

E-mail: mwarner@uwc.ac.za

KWEMERA KUGIRA URUHARE

Ubushakashatsi: Ibijyanye no Guteza imbere imirimo ntakazangufu mu bafata imiti igabanya ubukana bw'agakoko gatera SIDA.

Nyuma yo gusobanukirwa iby'ubu bushakashatsi n'ibijyanye nabwo mu rurimi numva, nemeye kugira uruhare muri ubu bushakashatsi. Ibibazo mfite kuri ubu bushakashatsi byasubijwe. Ndumva neza ko bazangirira ibanga no kuba nemerewe kwivana muri ubu bushakashatsi igihe cyose mbishatse kandi ko nta nkurikizi byangiraho.

Umukono/Igikumwe cy'ukorerwaho ubushakashatsi.....

Italiki.....

Amazina y'umutangabuhamya.....

Umukono/Igikumwe cy'umutangabuhamya..... Italiki.....

Ugize ikibazo kirebana n'ubu bushakashatsi cyangwa ushatse kumenyekanisha ibibazo wagize birebana n'ubu bushakashatsi, wabimenyesha:

Uwukuriye ishami ry'igihugu rishinzwe ubushakashatsi: Dr Wane Justin kuri 0788500499

Umunyamabanga w'ishami ry'igihugu rishinzwe ubushakashatsi: Dr. Emmanuel Nkeramihigo kuri 0788557273

Uwukora ubushakashatsi: Augustin MURENZI

Cell: +27(0)837216173 in South Africa or +250(0)788607641 in Rwanda

Email: murenzi55@yahoo.fr