Factors associated with physical activity levels among older adults in selected institutions in Southern Province of Rwanda

BY

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ABSTRACT

The size of the elderly population both in numbers and proportions of the whole world is increasing rapidly. The increase in the number of elderly people in the world will exert a big impact on health and social services. Population aging is also likely to cause serious societal challenges due to its associated increase in the number of individuals at risk for chronic diseases and injury. Participation in regular physical activity elicits a number of favorable responses that contribute to healthy aging, it is therefore established that physical activity is one way of limiting age related disabilities. Several studies have investigated factors that may be associated with physical activity participation and levels of physical activity in Rwanda among different age groups. However little has been done to investigate physical activity levels among older adults in Rwanda. This study aims to asses the levels of physical activity and the factors associated with it among older adults in Rwanda. A cross-sectional and descriptive study with a quantitative design was conducted. Sixty three (63) participants from two institutions for the elderly located in the Southern Province of Rwanda were purposively selected. An interview questionnaire with closed-ended questions was used to collect data. Descriptive and inferential data were analysed statistically with SPSS version 15.0. Frequencies and percentages were calculated for demographic data. Mean score values and standard deviations for each variable were calculated. Chi-square test was used to test the relationship between selected variables and physical activity participation. The mean age of the participants was 71 years (SD = 9.82; range = 55-101 years) and more than half (58.7%) of the participants were females. Furthermore the majority of participants were widowed (58.7 %) and reported alcohol consumption (60.3 %). Females were significantly more likely to

be physically active than males. Younger participants were more likely to be physically active than the older participants, although not statistically significant. No statistically significant association was found for physical activity participation, marital status, location of residence and education level. Fear of falling and alcohol consumption were significantly related to physical activity participation. Conclusively the study recommends that there is need to promote physical activity among older adults so that this part of the population do not loose on the benefits of physical activity.

Key words

Physical activity, older adults, Chronic diseases of lifestyle, Physical exercise, selected institutions, Huye, Gisagara and Ruhango Districts and Rwanda.

DECLARATION

I hereby declare that "**Factors associated with physical activity levels among older adults in selected institutions in Southern Province of Rwanda",** is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

MAURICE KANYONI

Signature..... **November 2008**

Witness: Professor Julie Phillips

.....

DEDICATION

I dedicate this mini-thesis to my mother, late VALERIE KAYIRABA

AND

My father, late POLAND, S. VINCENT

Thank you for your parenting care that made me whom I am.

ACKNOWLEDGEMENTS

I thank God for keeping me going despite the hard stumbling blocks on the course of life. I owe my late mother all round and heartfelt thanks for the effort made in caring for me and trying to shape me through adolescence to adulthood though it is was unfortunate you did not live to see me throughout adulthood. My sincere gratitude to my supervisor, Professor Julie Phillips for the courage, critics, sacrifices and guidance, which permitted me to produce this kind of work without your patience and talent of being approachable compiling this research paper would have been a dream. My sincere thanks are extended to the Government of Rwanda through her Student Financing Agency for sponsoring this piece work and accomplishing my other financial obligations while in the Republic of South Africa. I am also grateful to all the participants in this study. I would like also to convey my appreciation to all my relatives, brothers and sisters for their moral support rendered while pursuing my studies away from home.

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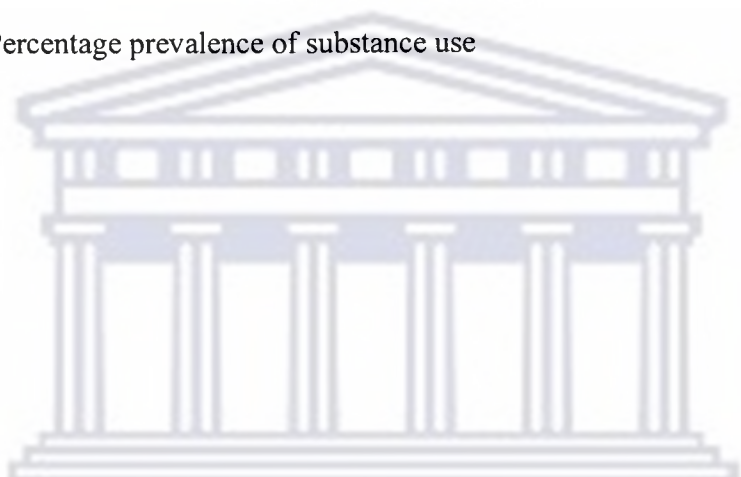

CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

In this chapter the researcher will give an overview of population ageing worldwide, in Africa and in Rwanda in particular. Furthermore the significance and objectives of the study will be presented in this chapter in relation to physical activity among older adults with specific reference to Rwanda. The chapter concludes with the definition of terms used in the study and an outline of the chapters of the thesis.

1.2 BACKGROUND

The size of the elderly population, both in numbers and proportion of the whole population is increasing rapidly in most parts of the world (World Health Organisation, 2002). Numerous researchers have expressed that population aging would be one of the most important social phenomenon for the next half century (Kaplan, Newsom, McFarland & Lu, 2001). The increase in the number of elderly people in the world will exert a big impact on health and social services (Hill, 1995). This impact is mostly due to the association between the increase in the number of elderly and the number of individuals at risk of chronic diseases, disability and injuries (Amosun & Reddy, 1997).

Due to improving health care in developing countries, life span tend to increase with some elderly people enjoying relatively good health, but also with a big number suffering

from diseases related to old age (Malambo, 2005). According to Booth (2000), chronic diseases of lifestyle accounts for 50% of all deaths in developing economies and 85% of all deaths in developed economies. Population aging is likely to cause serious societal challenges due to its associated increase in the number of individuals at risk for chronic diseases and injury (Marks, Lambert, Jun, & Song, 2008). From this point of view there is a need to concentrate effort on improving the life of older adults. Evidence shows that the physical and mental health of older people can be made better by encouraging individuals to live a physically active life style (Blackman, Kamimoto & Smith, 1999; Blair & Brodney, 1999; Buchner, 1997).

Mark et al, (2008) ascertained that moderately intense physical activity may delay the onset and sometimes prevent some incapacities associated with the aging process. A number of studies have shown the ability of increased physical activity to improve psychological well-being, reduce distress and decrease depression (Morgan & Bath, 1998; Cooper-Patrick, Ford, Mead, Chang, & Klag, 1997; Mobily, Rubenstein, Lemke, O'Hara & Wallace, 1996). Maintenance of a physically active lifestyle in old age is also associated with better health and less disability (Hirvensalo, Lintunent, & Rantanen, 2000). Furthermore Hirvensalo et al., (2000) discussed the risk of functional decline, mortality and morbidity which they found to be higher among older adults who did not exercise regularly. Physical activity according to a report by the Surgeon General (n.d) has been recommended to reduce symptoms of anxiety and depression; and it fosters improvements in mood and feelings of well-being in older adults. In older adults, physical activity helps to maintain healthy bones, improve muscle strength and joint

mobility, consequently reducing risk of falling and fractures enabling older adults to live independent lives (Fletcher & Hirdes, 1996). Gillespie, Gillespie, Robertson, Lamb, Cumming, and Rowe (2002) found that older adults are sensitive to effects of physical activity; even small amounts of activity are healthier than a sedentary life.

According to Allain et al. (1997) there is a tendency for mortality rates to increase in young adults in Africa due to AIDS pandemic. This situation calls for older adults to remain healthy and active in order to support large numbers of orphans left behind as AIDS victims.

In Rwanda there is evidence to suggest that as time goes by, the number of elderly people is increasing (Rwanda Census of Population and Housing, 2002 & Rwanda Poverty Reduction Strategy Report, 2005). The Rwanda Census, (2002) shows that, the number of people aged 65years and above was 7.2% of the total population. It is estimated that by 2025, the population of Rwanda shall have doubled from the current 8,440,820 people and it is in this line that the number of ageing people shall continue to grow (Kagaba, Nsanzabaganwa, & Mpyisi, 2003).

In1992; Rwanda in her health care reforms the main objectives were to provide equitable access to cost-effective quality health care (Sekabaraga, 2001). In accordance with the primary health care principles of accessibility, affordability and full community participation (Sanders, 1998) and based on the Bamako Initiative, Rwanda introduced community participation for financing and management of health care. The vision was to

invest in strong prevention interventions of major diseases by public subsidies and performance based financing of public health facilities to improve quality of care. This was intended to bring the prevention role close to the community and primary health care workers. It is therefore pertinent to establish the levels of physical activity and the factors associated with it so as to promote active ageing among Rwandans in line with the above principle.

Several studies have investigated factors that may be associated with physical activity participation and levels of physical activity in Rwanda among different age groups (Kagwiza, Phillips & Struthers 2005; Tumusiime & Frantz, 2006; Murenzi, 2001). However little has been done to ascertain the factors associated with physical activity participation among older adults. One study among working adult women with an average age range of 19 to 56 years and a mean age of 30 years showed that physical activity participation decreases with age (Kagwiza et al, 2005). Furthermore by the age of 51 years, all the participants in that study were considered physically inactive (Kagwiza et al., 2005). Thus there is need to establish the factors associated with physical activity levels and participation among older adults. Age related impairments and disabilities can be minimized and delayed in onset if a physically active lifestyle is developed. However, there is no available data on factors associated with physical activity in the elderly population in particular in Rwanda. Therefore this study aims to asses the levels of physical activity and the factors associated with it among older adults in Rwanda.

1.3 STATEMENT OF THE PROBLEM

Physical activity has been found to improve health, and quality of life, especially in the elderly. A sedentary lifestyle has been established as an independent risk factor in functional dependence and mortality. Regardless of the benefits of a physically active lifestyle, a large proportion of older adults have been described as physically inactive. There is scarcity of data on the elderly population in Africa in general and more so related to physical activity in this population.

There is evidence that there is a rapid ageing community in developing countries and the increase is likely to advance further in the coming years partly due to improving medical care (Malambo, 2005). This improved health care will contribute to increased life expectancy with some elderly people living relatively good health but also a growing number of elderly people suffering from diseases of old age (Van Eeuwijk, 2003). Physical activity is one way of minimizing and delaying the onset of diseases of old age. Physiotherapy could play a role in the promotion of physical activity, management of age related diseases among older adults and also facilitate the implementation of some of relevant recommendations of WHO on active ageing specifically in Rwanda where less has been done (Briefing Paper, 1992). This therefore led the researcher to the following research query; what are the levels of physical activity and the factors associated with it among older adults living in institutions in Rwanda?

1.4 RESEARCH QUESTION

What are the levels of physical activity and the factors associated with it among older adults in the Southern Province of Rwanda?

1.5 OVERALL AIM OF THE STUDY

To determine the levels of physical activity and the factors associated with it among older adults in the Southern Province of Rwanda.

1.6 SPECIFIC OBJECTIVES OF THE STUDY

1. To establish the levels of physical activity among older adults in the Southern Province of Rwanda.
2. To establish the socio-demographic factors associated with physical activity among older adults in the Southern province of Rwanda.
3. To establish the association of selected factors other than socio-demographic; with physical activity among older adults in the Southern province of Rwanda.

1.7 SIGNIFICANCE OF THE STUDY

The results of this study will be used to inform people working with older adults about the importance of engaging in physical activity by older adults. Furthermore the results of this study will be a contribution to Rwanda where little has been done in relation to physical activity in older adults. Since there is an increasing need for institutional living

in Rwanda, like in any other developing country, results of this study can form a foundation for the physical activity promotion in institutions caring for older people.

1.8 LIST OF ABBREVIATIONS

UN	United Nations
WHO	World Health Organisation
US DHHS	United States department of Human Health services
ACSM	American College of Sports Medicine
AHA	American Heart Association
CFLRI	Canadian Fitness and Lifestyle Research Institute
BMD	Bone Mineral Density
CHAMPS	Community Health Activities Model Program for Seniors
MFES	Generalised Distress Scale

1.9 DEFINITION OF TERMS USED IN THE STUDY

Older adults: The definition of older adult varies based on context and purpose of a study. Gerontologists define an older adult as some one aged 65 years and older (Abeles, Muller, & Klee, 2007). Using 60 years of age as a demarcation for old age may not be appropriate for sub-Saharan Africa since more than 80 percent of countries in this region have a life expectancy at birth of less than 55 years of age (Velkoff & Kowal, 2007). This benchmark age was chosen following extensive literature search on what ought to be the appropriate cut-off point for an "older person" vis-à-vis discussion on chronological, cultural and functional categorization of people as old (WHO, 2002a). The researcher was aware that this was in tandem with discussions in gerontological circles to adopt 55 years as the age at which one is commonly categorized as "ageing", especially in Africa. In most of the poor economies, the burden for survival puts people at a greater disadvantage than in rich countries, making them to age prematurely. Secondly, in most African traditions the title "older person" is socially dictated by one's role in society: for example becoming a grandparent confers such a title and the added respectability, regardless of the chronological age. The choice of 55 years was therefore taken in order to accommodate these definitional complexities and provides a sample base, which sociologically and chronologically merits the label "older person". Therefore for this study an older adult is a person aged 55 years and older.

Physical activity: Physical activity is defined as "any bodily movement produced by skeletal muscles that result in energy expenditure (Eurenius, Biguet, & Stenstrom, 2003).

Physical exercise: "exercise is a subset of physical activity defined as planned, structured and repetitive bodily movement done to improve or maintain one or more component of physical fitness" (Eurenius,et al., 2003).

Chronic diseases of lifestyle: "Chronic diseases of lifestyle are a group of diseases that share similar risk factors as a result of exposure, over many decades, to unhealthy diets, smoking, lack of exercise and possibly stress" (Centre for Disease Control, 2000).

Institutional living: This is where an institution is established for elderly people or any other group of people with limited functional capacity so as to cater for their accommodation and assistance with everyday living (De Vos & Schwartzman, 2008). For purposes of this study residential institution and residential home will be used interchangeably.

1.10 OUTLINE OF THE THESIS

Chapter one gives a brief account of population ageing, aims, motivation for the study and the significance of the study. The overall aim of the study was to establish the levels and factors associated with physical activity among older adults in Rwanda.

Chapter two presents a review of relevant literature so as to understand the motivation for the study. This chapter gives a brief account of population ageing worldwide and in Africa in Particular. It is under this chapter that theories and processes of ageing are highlighted; the chapter gives emphasis on the health benefits of physical activity among

older adults, the recommended levels of physical activity for older adults. The risks of physical inactivity among older adults are dealt with under this chapter. The literature reviewed includes physical activity programs for the elderly and the role of physiotherapy in the promotion of physical activity with particular reference to elderly.

Chapter three considers the methodological issues relevant to the study. The chapter provides the study design gives an overview of the research settings, procedure, study sample and data analysis.

Chapter four compiles the results of the data in an attempt to answer the objectives of the study mentioned in chapter one.

Chapter five discusses the results with reference to other studies carried out elsewhere with the same or different methodological approaches.

Chapter gives a summary of the results, observations, recommendations and highlights the limitations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews the available literature and attempts to highlight the gap that exists regarding physical activity among older adults especially in Rwanda. The chapter illuminates on the following issues; demographics of the elderly, theories explaining the process of ageing, the living arrangements for the elderly in Africa, dynamics involved in, factors influencing, and levels of physical activity among the elderly, and benefits of physical activity with special emphasis in the elderly population. The need for physical activity promotion programmes is highlighted and the role of physiotherapy in the general health care of elderly in particular physical activity programs.

The relevant literature was accessed through an extensive search of databases; including EBSCOhost, PubMed, MEDLINE, CINAHL, Blackwell Synergy, Cochrane library, InfoTrac, Science direct and Google Scholar. The search was not limited in terms of time therefore the databases were searched from the time of inception until 2008. Search terms were: physical activity, physical exercise, elderly and older adults. Each database has its own indexing terms therefore search strategies were designed to suit every database, to some databases Boolean operators were applied. Reference lists of the retrieved research papers were searched for additional information and textbooks and Journals available at the library of the University of the Western Cape were hand searched.

2.2 THE ELDERLY POPULATION IN AFRICA

The main concern of the world in the 21st century has been the considerable increase in the absolute and relative numbers of older people in both the developed and the developing world (Coleman, 2001). The costs to the community of the elderly being in poor health are also growing proportionately (Daley & Spinks, 2000). From a demographic point of view, population aging is a result of fewer children being born in relation to more people reaching old age (Kayonga, 2005). Although Sub-Saharan Africa's elderly population is not as large as in other regions of the world, it must be considered as a potential cause of concern because the largest increment in the number of elderly in the world between 1980 and 2000 occurred in Asia and Africa (Nordberg, 1997). The population of Africa's elderly population 65 years and over on average, stands at about 3% and is expected to increase enormously by 2025 (Kalasa, 2004).

In the past, the extended family system was able to cater for elderly members in Africa, but with urbanization, modernization, poverty and economic insecurity, the extended system is slowly disintegrating (Amosun & Alawale, 1994). This disintegration led to the creation of institutional care for the aged in Africa to compensate for the breaking family role (Nordberg, 1997). The need for institutional living tend to increase in Africa due to economic and health problems of older people, changing family lifestyles and scarcity of institutions (Inal, Subasi, May & Hayran, 2007). Increasing demand for institutional living in Africa according to Sen (1994) cited by Ramashala (2004) has been linked to a number of factors like HIV/AIDS, migration of young generation leading to situations where young people are unable to provide the required help to older people and families

under strain of persistent economic problems. This implies that investing in policies that promote healthy aging should produce high societal and health returns (Kalache, 1991).

Most developing countries have been experiencing a combination of population ageing and urbanization in a relatively short period of time and it is projected that by 2050, the number of persons aged 60 years and over in the developing countries will be nearly four times greater than it is today, and that the proportion of older persons residing in urban areas will rise (UNCHS Habitat, 1999). The generally wide income difference between rural and urban settings and the significant migration of younger members of the family to the city increase the probability that older persons in the countryside will become socially and economically vulnerable.

In the developing countries, the large majority of seniors live with their adult children. In Africa and Asia on average, about three quarters of those aged 60 years or over are living with their adult children (Branco, 1995). The proportion of older persons living alone in developing countries is less than 10 per cent (WHO, 2000). The WHO (2000) further estimates that this proportion is declining in some countries but in most of them it is slowly increasing. The exception is Ghana where the proportion of older people living alone has shown a remarkable increase, almost doubling, from 12 to 22 per cent in the period 1980-1998 (United Nations, 2005a). Solitary or institutional living in developing countries is particularly problematic because of the generally limited social support programmes for older persons (United Nations, 2005b). In addition, lack of funds and human resources restricts the availability of institutional care in developing countries.

Pelaez, Wong, Palloni and Markides (2006) point out that growing urbanization of the population has been a major dimension of modernization in the developing world.

Older persons who relocate from rural to urban areas tend to face different problems; In addition to economic difficulties and a lack of steady income they often experience a loss of social networks and a lack of supporting infrastructure in cities. Without adequate transportation and opportunities to incorporate themselves in the urban environment, there is greater risk of their being isolated and marginalized, especially when frailty and/or disability restrict their mobility. This will necessitate developing countries seeking institutional residence for these older adults. Older persons in developed countries are more likely to live in non-familial residential settings, but overall only a small proportion of older people in all countries live in centres of institutional care (UN, 2002).

Becoming a resident of a nursing home involves a change of ones' social environment considerably in terms of family members and friends. This shifts life from individual to institutional and often imposing the additional burdens of physical constraints. Nursing homes residents are most of the time found in a situation to accept a sick role that relieves them of their social and physical obligations and depend on the caretakers for their day to day physical and social accomplishment (Wetle, et al., 1991). As a result residents' ability to engage in physical activity and their social connections that previous gave their lives meaning is reduced. Literature suggests that the loss of control in what activities to engage in or not associated with institutionalization may result in residents disengaging from social and other activities including physical activity (Kalache, 1991). Though

individual initiative may be necessary to become or remain socially engaged, there exist physical, personal and environmental obstacles present in most of nursing homes.

Sen (1994) as cited by Ramashala (2004) urges that a combination of factors like HIV/AIDS, migration of young generation leading to situations where children are unable to provide the required help to older people and put families under strain with persistent and complex problems put to task authorities to institutionalize their elderly who need extensive care. In the last decade, the HIV/AIDS epidemic has had devastating but under-reported impacts on the lives of older people and those who depend on them (Fouad, 2005). Older people in most African societies are a vulnerable group as a result of a lifetime of hardship, malnutrition, poverty and, in older age, high susceptibility to chronic diseases (WHO, 2002). The AIDS pandemic is now posing an additional burden on them. In their old age, when they may require support and expect to be looked after, they have to take on the role of caring for others, in most cases without even the basic necessary resources. Thus, their health is the most precious asset not only to them, but also to their families and communities. Lacks of economic, social and psychological support, combined with poor access to health services, constantly restrict their ability to provide the care expected of them (WHO, 2002b).

2.3 THEORIES OF AGEING

Aging is the progressive accumulation of diverse deleterious changes in cells and tissues with advancing age that increase the risk of disease and death (Harman, 2003). This process may be common to all living things, for the phenomena of aging and death is

universal. If so, both aging and the rate of aging are under genetic control to some extent for the manifestations of aging, and life span differs between species and individual members of a species (Harman, 1981). Furthermore like all chemicals and chemical reactions, the manifestations of aging which reflect chemical composition and the rate of aging should be subject to environmental influences.

The frequently seen reduction in the body's reserve is partly due to normal biological aging (Malambo, 2005). Vandervoort, (1995) observed that the reductions can be reflected in most if not all of the body systems however there are several attempts to slow down this rate of system reduction in functional deterioration. The conventional means which indirectly controls this reduction in system slow down is by improvements in general living conditions, like better nutrition, housing, and medical care (Harman, 2003). However studies have demonstrated that these means have proved increasingly ineffective in USA (WHO, 2002b; UN, 2005a).

Aging is a multidimensional change in the physical, psychological as well as in social aspects for an individual (Varshney, 2007). Varshney, (2007) discussed aging as a progressive reduction in the physical and mental functions with associated decline in both the capacity of the body to maintain homeostatic balance as well as the adaptability of the individual to various stressors thereby increasing the chances of illness and mortality. However, not all individuals age in a similar way. In biological terms, aging is a dynamic process that represents the molecular, biochemical, physiological and structural changes that take place in an individual following the cessation of growth (Dey, 2003).

Owing to the fact that aging is inevitable and its associated physiological functional declines, there is need to promote health behaviours at an early age and those who are already old start living active life style. Currently the benefits of physical activity among elderly are indisputable ranging from prophylactic to curative.

Despite the great deal of interest in aging by social scientists, the concept remains poorly understood yet excessively theorized upon. A number of theories however try to shade more light on physiological, physical and psycho-social factors associated with aging. Different scientists have put forward theories to explain ageing process and the associated biological and anatomical changes to the body systems.

The free radical theory of aging, and the simultaneous discovery of the important involvement of free radicals in endogenous metabolic reactions, was proposed in 1956 by Harman in his experimental research of radiation Chemistry (Ishikawa, 2000). This theory believes that the common aging process is the initiation of free radical reactions. These reactions however initiated, could be responsible for the progressive deterioration of biological systems over time owing to their innate ability to produce random change due to the high chemical reactivity of the intermediate free radicals.

When human fibroblast cell cultures were stored in liquid nitrogen, and restarted after a period of time of storage, the cells showed the level of senescence expected from the number of cell passages, but not based on the amount of chronological time, including the storage period, that had elapsed (Hayflick, 1965). This result indicated that there must be

a molecular apparatus in cells that records the number of cell divisions undergone. Ishikawa (2000) believes that once cells have undergone a critical number of divisions, this molecular apparatus activates a signal leading to the senescence outlook or phenotypes. This was later called **"Aging Clock Theory"**. Ishikawa (2000) observed that there is supporting evidence of the aging clock from different and unrelated biological systems.

The **"Activity theory"** defines the concept of successful aging. It emphasizes that successful aging involves preserving the attitudes and activities of middle age for as long as possible, thereby keeping the older adult psychologically, behaviorally and socially fit as stated by Havinghurst (1953) in Varshney, (2007). The activity theory tries to establish a link between activity participation and role loss; the theory postulates that there is a direct proportionality relationship between role loss for the individual and his/her participation in various activities. However there is an inverse relationship between activity level and role identity resulting in self concept and self satisfaction. The theory is criticized for oversimplifying the situation and not coming up with explanation of individuals' personal interest and abilities in the middle age.

2.4 PHYSICAL ACTIVITY AND OLDER ADULTS

Hoehner et al, (2008) urges that most low- and middle-income countries are experiencing a shift from a high prevalence of infectious diseases to a high prevalence of non-communicable diseases (e.g., cardiovascular disease, diabetes). These shifts are due in part to rapid urbanization and globalization processes in which behaviors, lifestyles, and

living situations are changing rapidly (Filozof, González, Sereday, Mazza & Braguinsky, 2001). The World Bank, (2007) reports that, 56% of all deaths in developing countries may be attributed to non-communicable diseases and the World Health Organisation estimates that by 2020, 80% of all deaths may be attributed to these diseases. The growing burden that chronic disease is placing on developing nations is increasing the attention to risk factors such as sedentary lifestyles. Physical activity may be partly a solution to this burden of the chronic disease epidemic.

Despite the benefits of physical activity through out lifespan, the National Center for Chronic Disease Prevention and Health Promotion reports that more than one half of American adults do not get enough physical activity to provide health benefits, while 25% of older adults are not active at all in their leisure time (Pitsavos, Panagiotakos, Lentzas & Stefanadis, 2005). Worldwide, the World Health Organization estimates that over 60% of adults are not active enough to benefit their health (WHO, 2000). It has been suggested by Pitsavos et al., (2005) that physical activity declines significantly with age, it is generally higher among females, and the overall inactivity trend is worse in poor urban areas.

Little data is available on the levels of physical activity among older adults in Africa. A study conducted in Ethiopia among elderly men and women established that 87.8 % did not participate in physical activity sufficient to gain health benefits according to World Health organization criteria (Banata, 2003). A study among working adult women with

an average age range of 19 to 56 years in Rwanda showed that by the age of 51 years, all the participants were considered physically inactive (Kagwiza et al.2005).

The above evidence shows that generally older adults living in developing countries are less physically active specifically Africa.

2.5 BENEFITS OF PHYSICAL ACTIVITY IN THE ELDERLY POPULATION

Regular physical activity has been associated with many health benefits in all age groups. The benefits for older people include among others improved fitness and quality of life prevention of osteoporosis and a reduction in the risk of falling (Gillespie et al., 2002).

A number of factors contribute to the loss of muscle mass and sarcopenia. Muscle fiber denervation, decreased rate of protein synthesis, decreased concentration of several hormones that have an anabolic effect and insufficient dietary intake of protein and/or energy may contribute to sarcopenia (Evans, 2000). The presence of one or more of the above factors in old age would lead to decreased muscle mass and impaired muscle regeneration after injury or overload. Lack of physical activity is definitively an important factor in increasing and accelerating the development of sarcopenia (Roth, Frrel, & Hurley, 2000). It leads to impairment of physical function in addition to annoying too "large skin". Reduced muscle strength and poor balance are important risk factors for falls. Increased physical activity can increase the muscle mass, strength, endurance, and power of muscles even in late life hence minimizing sarcopinia.

Increased physical activity leads, depending on its type, to increased mass, strength, power and/or endurance and consequently to increased physical performance capacity and improved metabolic capacity of the muscles, influencing the energy balance and carbohydrate and fat metabolism in health-enhancing ways (Vuori, 2004). Lack of physical activity leads to opposite changes that are especially deleterious to functional capacity and health in older persons.

Osteoporosis is usually symptomless and therefore it often develops latently. Osteoporosis is characterized by low bone mass and micro anatomical changes of bone tissue (Evans, 2000).The commonly used indicator of bone mass is bone mineral density (BMD). It accounts for 75 – 85% of the variance in ultimate bone strength.
Physical inactivity can influence the risk of osteoporotic fractures by increasing the risk of osteoporosis and risk of falls.

The risk of hip fracture is between 20 and 40%, but up to 55% higher in physically inactive as compared with active subjects (Gregg, Pereira, & Caspersen, 2000; Kujala, Kaprio, Kannus, Sarna & Koskenvuo, 2000; Hoidrup, Sorensen, Stroger et al., 2001). However, physical inactivity may decrease bone strength more than bone mass due to changes in the bone mass distribution (Sorensen, Stroger et al., 2001). This effect is seen particularly in older subjects who may be at risk of osteoporosis (Uusi-Rasi, Sievänen, Pasanen, Oja & Vuori, 2002). Physical inactivity may have the most critical role in increasing the risk of osteoporosis in subjects with high risk for this condition due to

genetic and/or other factors (Oja & Vuori, 2002). Physical inactivity contributes to the risk of osteoporotic fractures also by increasing the risk of falls.

Low back or lumbar pain, muscle tension and stiffness is experienced by 70 to 85% of all people at some time during their life, and at any one point in time, 15 to 45% of a population have these symptoms (Andersson, 1999). In most cases, the symptoms disappear, but their recurrence is common and for a smaller number, the syndrome becomes chronic. Physical activity and inactivity could be related to low back symptoms in several ways. Physical activity could cause the symptoms by inducing acute or repetitive subclinical or more severe injuries to back structures. On the other hand, physical activity could maintain or increase the strength or/and endurance of the back and trunk muscles, and maintain flexibility and good movement coordination, thus decreasing the risk of injury (Suni, 2000).

The distribution of causes clearly differs among the populations studied. High-risk elderly citizens living in institutions tend to have a higher incidence of falls caused by gait disorders, weakness, dizziness, and confusion, whereas the falls of community-living persons are more related to their environment (Laurence et al., 1994).
It has been suggested that fear of falling is a predictor of future falls (Delbaere, Crombez, Vandertraeten, Willems, & Cambier, 2004).

There is an increasing high number of resources for trauma care that are needed among older adults. Approximately one quarter of persons 65 to 74 years of age living in the

community report at least one fall per year (Hadjistavropoulos, LaChapelle, MacLeod, Snider, & Craig, 2007). It has been reported by Hadjistavropoulos et al., (2007) that painful fractures, soft tissue injuries, joint dislocations, and persisting impairments occur as a result of falls. It has been demonstrated that falls represent one of the leading causes of hospitalization for persons older than 65 years of age (Wilkins, 1999). Furthermore this author reported that the death rate from falls increases with age. There is also some evidence to support the observation that falls reduces with fitness among elderly residents however physical activity may be restricted due to fear of falling (Hadjistavropoulos et al., 2007). Cumming, Salkeld, Thomas, & Szonyi (2000) are of the view that people with high fear of falling experience greater declines in activities of daily living over time.

Several studies suggest that physical activity substantially reduces the risk of dying of coronary heart disease, stroke, type diabetes and colon cancer (Sesso, Paffenbarger & Lee, 2000, Wei et al., 1999, US Department of Health and Human Services, 1996). Crombie, (2004) also stated that physical activity reduces deaths from cardiovascular disease and can improve cardiovascular risk profile (Crombie, 2004). A number of psychological benefits of physical activity has also been reported among older adults such as satisfaction with weight, shape, appearance and fitness McAuley (1994, p551). The US Department of Health and Human Services survey (1996) also concluded that physical activity can relieve symptoms of anxiety and depression and may help prevent psychological disorders in older adults. It further helps to control weight, contributes to healthy bones, muscles, and joints, reduces falls among older adults, helps to relieve the

pain of arthritis, reduces symptoms of anxiety and depression and is associated with fewer hospitalizations and medications (US DHH, 1996).

Nomura, Ma and Swan (2003) points out that physical activity is one way of limiting age-related impairments such as decreased flexibility, degenerative joint diseases, obesity and hypertension. Researchers have stated that physical activity does not need to be strenous so as to promote health, but what is needed is moderate intensity exercise on a regular basis (Kagwiza et al., 2005). This level of physical activity can be reached through activities of daily living (ADL) like walking, climbing stairs, washing clothes, cleaning the house and gardening (Centre for Disease Control, 2002). Long term regular physical activity is associated with better cognitive function and less cognitive decline in older adults (Breteler, Ware, Manson, Kang & Grodstein, 2004).

A higher level of self-esteem has been reported as a benefit of physical activity among physically active older adults (Sallis & Owen, 1999). This increase in levels of self-esteem is true for older adults as well as children and young adults (King, Oman, Brassington, Bliwise, & Haskell 1997). King et al. (1997), furthermore reported a higher quality of sleep, shorter time to fall a sleep, and longer sleep duration among older adults who are physically activity. Moderate intensity physical activity such as walking or cycling, can improve sleep in sedentary older adults; a group that commonly reports trouble sleep (Sallis & Owen 1999). Physical activity has been shown to contribute to a reduction in illness and premature death, and to the containment of health care costs (Health of Canadians, 2002).

WHO (2000) estimates that a reduction of 10% in physical inactivity among older adults aged 65 years above would result in savings of $5 billion in discounted lifetime costs for medical care, sick leave and lost revenues from taxes resulting from premature mortality.

Health outcomes of physical inactivity also yield important societal consequences. Reduced health status in later life not only leads to important health care costs, but also to a reduction in volunteering, an increase in caregiver burden, a decrease in the capacity for self-care, a reduction of labour force participation, and an increase in early retirement by older workers (Wagner et al, 1992). While difficult to quantify, reduced participation of seniors in society is a general outcome of physical inactivity.

2.6 FACTORS INFLUENCING PHYSICAL ACTIVITY IN THE ELDERLY POPULATION

According to the World Health Organisation (1997), increasing physical activity may help prolong health and preserve the quality of life in late adulthood. However, there is little information about the demographic and psychosocial correlates of physical activity in the older adults (Kaplan et al., 2001). Kaplan et al. (2001) further stated that social support among others is associated with increased physical activity for older adults.

Although the benefits of regular physical activity have been studied extensively, researchers have only recently examined the determinants of physical activity in special populations such as the elderly. The focus of earlier exercise research was centered on healthy young and middle-aged people (King et al., 1992). As research into the older

population has progressed, it is seen that physical activity behavior in older adults is associated with diverse factors. Not surprisingly, the predictors of exercise adherence observed among younger adults are unreliable in elderly. The following is a discussion of the perceived barriers or constraints and facilitators for physical activity that have gained empirical support.

2.6.1 Barriers

The elderly most frequently cite poor health as the leading barrier to both physical activity and exercise (Schuler et al, 2006). Schutzer and Graves, (2004) points out that physical environment can also present as a potential barrier to physical activity participation and adherence. Environments with necessary and convenient resources for exercise and physical activity performance, such as sidewalks, parks, recreation centers, and fitness facilities, make it easier for people to be physically active. However the same author urges that environments with high crime decrease the likelihood of people becoming more active. Data from CDC (1996) show that older adults, especially for whom walking was the preferred exercise modality, performed greater levels of physical activity when they perceived higher levels of safety in their neighborhoods.

Physicians play an important role in promoting exercise behavior among the elderly Schutzer and Graves, (2004). On average 3.1% of Americans visit their doctor per year (Cherry, Burt & Woodwell, 2003); this would suggest that for older adults who are affected by chronic health conditions the statistics are even higher. Clearly, this establishes the family physician as the most effective person for giving advice about

exercise. Despite frequent exposure to the general public, research findings have indicated physicians are not regularly counseling their patients about exercise (Balde, et al., 2003; Hage, 1983).

According to Hage, (1983) the lack of knowledge and understanding of the relationship between moderate exercise activity and health in the elderly population is an especially relevant barrier, as many lived through a time period when exercise was not valued or deemed necessary. Many elderly feel they already receive enough exercise in their activities of daily living. Poor awareness of the role of exercise in disease prevention is seen not only among the elderly (O'Neill, & Reid, 1992). However Dishman (1982) points out that the level of one's knowledge does not necessarily translate into long-term exercise or physical activity adherence but King et al, (1988) observed that perceived feelings of enjoyment and satisfaction which is associated with exercise appears to better predict higher levels of physical activity adherence.

Although limited studies have been done, some available evidence suggest that exercise patterns in childhood can largely affect levels of exercise in adulthood (Schutzer & Graves, 2004). In their investigation, Taylor et al, (1999) found a weak negative relationship between experiences and factors from childhood and adolescence and older adults' current activity levels. Although participation in team sport was positively associated with greater adult exercise behavior, being forced by parents to exercise in the preteen years seemed to negatively affect exercise participation in adulthood. This

evidence leads us to conclude that there is a carryover benefits achieved during youth to late adulthood.

2.6.2 Facilitators

Cohen-Mansfield, Marx and Guralnik, (2003) noted that barriers to physical activity to be highly related to motivators. For example, poor health, which can reduce an older adult's ability to exercise, was also frequently cited as a motivator for increasing physical activity (Schutzer & Graves, 2004). Other motivators reported by Cohen-Mansfield et al., (2003) include having more time, receiving more information on physical activity benefits or physician recommendation, and living closer to an exercise facility.

Cues have been seen to promote physical activity compliance in aging adults. In an attempt to identify more efficient and less costly approaches to motivate and promote physical activity behavior, the use of prompts such as informational mailings and telephone contact and educational intervention, have been investigated and simple prompting was found significantly more effective than lengthy educational sessions in encouraging physical activity adherence (Conn et al., 2003).

"Incorporating appropriate music into exercise programs can add interest and may serve to facilitate exercise participation and adherence in the older adult" (Schutzer & Graves, 2004). Music is said to enhance the exercise experience by lessening the perceptions of difficulty, monotony, and discomforts associated with exercise (Martin et al., 2000). This

can be helpful especially for older adults who perceive physical activity to be difficulty, tiresum and claim that it is designed for young people.

Generally literature reveals the best adherers to regular exercise are individuals, who lead an active lifestyle, were fit at baseline, have lower body mass, have fewer chronic diseases and pain, are nonsmokers, and have higher levels of self-efficacy (Martin et al., 2000, Balde, et al., 2003, King, 1992). Exercise participation is greatly influenced by gender and old men have been found to be more physically active than their women counterparts; and black women seem to be less active than white women (Booth, 2000).

Conclusively efforts to optimize health through physical activity in the elderly have both barriers and motivators. Since a one-size-fits-all strategy does not address the specific needs of a given population, identification of reliable exercise predictors is essential to participation and adherence.

2.7 COMPONENTS OF PHYSICAL ACTIVITY PROGRAM FOR OLDER ADULTS

For general health and well being; a well planned physical activity program for older adults should include endurance, strength, balance, and flexibility (Cress et al., 2004). Most sedentary elderly individuals will prefer and should be encouraged to begin with low-intensity physical activity and these activities should be tailored to the individual's specific needs and interests to ensure maximal enjoyment and optimize adherence to the physical activity regimen (Cress et al., 2004). King, Rejeski and Buchner (1998) urges

that long-term adherence can be enhanced by making physical activity a part of one's lifestyle for those wanting to become more active. Group-based physical activity is an excellent way to start a physical activity program for elderly people as per King et al. (1998). It provides several advantages to the elderly, including enhanced adherence through social interaction with others and mutual commitment to physical activity among friends, opportunities for instruction in proper technique, and qualified supervision.

According to the US, DHHS (1996) endurance-related physical activity refers to continuous movement that involves large muscle groups and is sustained for a minimum of 10 minutes. Examples of endurance activities that would benefit older adults include biking, swimming, walking, and lifestyle activities that incorporate large muscle groups (Surgeon General, n.d). Some examples of lifestyle activities that build endurance when performed for at least 10 min without rest intervals are household chores such as washing windows, vacuuming, sweeping, mopping, and gardening activities such as lawn mowing, raking, or pruning (Stewart et al., 2001). These activities are relatively easy to perform by older adults compared to vigorous exercise to build endurance and muscle power. Cress et al, (2004) postulates that endurance activities provide the greatest protection against the deleterious effects of chronic diseases associated with aging. While some benefits accrue from low intensity activities, progression from low to moderate intensity is important for optimizing the benefits of physical activity (US, DHHS, 1996).

Strength-related activity refers to "increasing muscle strength by moving or lifting some type of resistance, such as weights or elastic bands, at a level that requires some physical

effort" (Cress et al., 2004). Strength development is safe for older adults and injuries are rarely reported. Instruction in proper lifting technique assists in minimizing injury.

Flexibility-related activity facilitates greater range of motion around the joint which is required by older adults (King, et al., 1998). Flexibility activities increase the length of the muscle beyond that which is customarily used in normal activity. These exercises should be performed a minimum of 2 days per week according to Vern Seefeldt, Malina and Clark (2002). In addition to a formal physical activity program, flexibility activities can be conveniently incorporated into the office routine while sitting at a computer or in an airplane. They may be done as a session alone or by inclusion in the cool-down portion of a strength or endurance program for the already exercising older adults. Stretching should include appropriate static and dynamic techniques. In dynamic stretching, the muscle is moved through the full range of motion of a joint, for example, arm circles. A static stretch is when the muscle is lengthened across the joint and held for a period of 10–30 seconds (American College of Sports Medicine, 2000).

Balance "is the ability to maintain control of the body over the base of support so as to avoid falling" (Carter, Kannus & Khan, 2001). While improvements in muscular strength and endurance can lead to improvements in balance, specific balance activities can have additional benefits for older adults. According to Carter, et al., (2001) there are two types of balance: static balance and dynamic balance. Static balance, as the name indicates, is the ability to maintain balance without moving, while dynamic balance is the ability to move without loosing balance or falling. Static balance can be improved by challenging the ability to maintain standing balance through decreasing the base of support and this

will tremendously increase balance and stability among older adults as indicated by (American College of Sports Medicine, 2000).

2.8 ROLE OF PHYSIOTHERAPY IN GERIATRICS

Moran (1993) acknowledges that physiotherapists are increasingly regarded as part of the geriatrics team and therefore gerontology has been encouraged in most curicurrum of Physical Therapy training of most colleges and Universities. One of factors that determine functional ability is mobility. However mobility deteriorates as musculoskeletal system weakens due to aging. Bouchard et al. (1994) argues that it is the physiotherapists who will help postpone the progressive loss of function with age. Furthermore loss of mobility is the most significant obstacle that prevents independent living among elderly in the community.

Physiotherapy has also a role to play in the rehabilitation of musculoskeletal injuries which predisposes older adults to early disabilities. Physiotherapy has a public health perspective in that it advocates for active ageing of individuals hence can influence policy change (Ahn & Kim, 2004). In promoting health and active ageing, physiotherapists could actively involve older people to be part of decision making with regards to their healthy ageing (Greenwald & Groat, 1993). They are strategically positioned since they act as health promoters to provide supervision and coordinate rehabilitation care for older people (Kay et al, 1994). While there is ongoing research about the role of each member profession in geriatrics (Amosun & Alawale, 1994), there

is a lack of similar information in many developing African countries, particularly Rwanda.

In America it was recommended that there should be improved dissemination of new research findings in geriatrics to different specialties in order to overcome widespread deficiencies in knowledge of principles of good geriatric care (Interdisciplinary Leadership Group of the American Geriatrics Society, 2000). Despite emphasis of governments to disseminate relevant information to professionals and general public, such dissemination tends to be difficult and slow. It is believed that there is limited knowledge among health professionals especially in African countries (Farkas, Jette, Tennstedt, Haley & Quinn, 2003).

With the mushrooming of elderly care homes in Rwanda, it is important to understand the level of physical activity among older adults since physical activity has been seen to promote physical and mental well-being among elderly. The psychological and physical benefits of physical activity among older people are acknowledged by health professionals (Dawn & Halley, 2004). Increased levels of physical activity are known to contribute to reduced risk of cardiovascular diseases, to prevent or delay the development of high blood pressure, and to help control diabetes, regulate weight and reduce the risk of osteoporosis and colon cancer (Health Development Agency, 2000). The participation rate in physical activity however is influenced by a number of demographic factors. Programs should involve all partners in health like government, Health department, local

government officials and elderly people themselves so as to achieve their successful outcomes (WHO: Healthy people, 2000).

The above mentioned diseases are the major world killers and prevented through living a physically active life however many studies show that older adults are still physically inactive especially in Africa.

2.9 SUMMARY

The literature review indicates that physical activity plays an important role in the health of older adults. The review highlighted the various factors influencing physical activity among older adults mostly in developed countries. The present study therefore hoped to provide information regarding both physical activity levels and factors associated with it among older adults in Rwanda.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter describes the research method employed in an attempt to establish the factors associated with physical activity among older adults in Rwanda. It will further describe the research setting, the study sample and data collection procedures. Furthermore this chapter gives an account of the research tools used and data analysis. The chapter concludes with the Ethical considerations applied in the study.

3.2 RESEARCH SETTING

The study was carried out in the Southern province of Rwanda. There are seven Districts in the Southern Province of Rwanda. Three of these districts have residential institutions for older adults, of these districts two are situated in rural areas and one in an urban area. To make sure that older adults from both settings are included, one district was selected from each (urban and rural) to participate in the study.

The urban District (Huye) and the rural Districts (Gisagara and Ruhango), Gisagara District was conveniently selected due to its accessibility. There are two residential institutions for the elderly people in Huye District; and one institution in Gisagara. All three institutions admit both male and female older adults from any part of the country. They are managed by the Roman Catholic Church, Butare Diocese. Residents are admitted to these institutions for various reasons including feeling insecure because of

living alone in the house, psychologically traumatized following the 1994 Rwanda Genocide, having no assistance from the family and having no shelter. Ngoma residential institution in Huye District was accommodating 15 residents at the time of data collection. Of the fifteen residents three (3) were in the age range of 25 to 30 years of age and epileptic. The rest were older adults with psychological disorders and disoriented. Therefore none of the residents of the Ngoma residential institution were eligible for inclusion in the study. Owing to this reason the study was carried out in Saint Aloys and Gisagara homes for the aged situated in Huye and Gisagara Districts respectively.

3.3 STUDY POPULATION AND SAMPLING

The study population consisted of all older adults aged 55 years and above living in the mentioned residential homes. At the time of the study, Saint Aloys and Gisagara homes accommodated 61 and 57 older adults respectively. Purposive sampling was used to select participants for the study. All residents, males and females aged 55 years and above, not mentally ill, without auditory or/and speech problems and no acute medical condition, at the time of the data gathering were invited to participate in the study.

At Saint Aloys home for the aged; 14 mothers with malnourished children who visit the centre for food assistance and nutrition education were not included in this study because they do not reside at the senior centre and were under the age of 55 years. A further 3 residents were under the age of 55 years, and another 3 were not included in the study because they took part in the pilot study. Therefore a total of 24 participants met the inclusion criteria at Saint Aloys Home for the aged.

Gisagara residence accommodated 57 residents at the time of the data collection, 3 older adults were left out of the study because they participated in the pilot study and 15 did not meet the inclusion criteria for the study. Therefore a total of 39 older adults met study criteria.

3.4 STUDY DESIGN

The study was a cross sectional, descriptive quantitative study. The advantage of cross-sectional research is that it is more economical in terms of time and cost than other designs (Hick, 1995). The reason for using this design is that there is only one period for data collection, and the researcher is not faced with the difficulty and cost of maintaining contact with subjects over a long period of time (King, 2001). This design was thus the most appropriate in determining the levels and factor influencing physical activity among older adults in Rwanda at a specific point in time.

3.5 RESEARCH INSTRUMENT

A structured interview-questionnaire consisting of various sections was used to collect data (Appendix A). The first section requested for information regarding demographic variables such as age, gender, marital status and educational levels. The second section of the questionnaire assessed the participants' fear of falling. The "modified falls efficacy scale" was used to measure fear of falling among the study sample (Tinetti, Richman & Powel, 1990). Fourteen (14) items were used; this scale aims to determine how confident participants feel in performing a range of activities on a scale of 0 (not confident at all) to

10 (completely confident). A low average score indicated lack of confidence in performing activities and high scores indicated complete confidence in performing activities.

To measure Psychological distress, the Generalised Distress Scale (GDS) was used (Kaplan et al., 2001). Participants were asked how often during the past month; they experienced some feelings which would include among others "so sad nothing could cheer you up", "nervous", restless or fidgety and "restless". Participants could respond with: "all the time", "most of the time", "some of the time", "a little of the time", and "none of the time" (Kaplan et al, 2001). A score of six or less were considered as "less distressed" and score of more than six as "more distressed".

The fourth section assessed the weekly frequency and duration of several physical activities typically done by older adults using the "Community Health activities Model Program for Seniors" "CHAMPS" physical activity questionnaire (Kaplan et al., 2001). The participants were asked questions related to physical activities such as walking, running, exercises, cleaning, etc. Participants were requested to report on a typical week during the four weeks preceding the study. Furthermore, participants had to indicate the number of hours of participation if they participated in requested activities. Other activities requested to report on included visiting friends or family, attending meetings or church activities.

3.6 VALIDITY AND RELIABILITY OF THE INSTRUMENT

Validity refers to the extent to which an instrument measures what it is supposed to measure (Polit, Beck & Hungler, 2001). Reliability tells how reproducible the results are on a retest (Sarantakos, 1997). To ensure reliability and validity of the instrument, the various sections was adopted from previous validated questionnaires used with older adults. The CHAMPS questionnaire has been found to be valid and reliable for older adults and appropriate for use in a variety of cultures and settings for physical activity promotion programs (Stewart & King, 1997). The GDS as a measure of depressive and anxiety symptomatology has been found to be reliable in a sample of people aged 65 years and above with a cronbach's alpha of 0.79 (Kaplan et al., 2001). Finally, Hill et al (1996) indicated that the Modified Falls efficacy scale is a reliable and valid measure of fall self-efficacy among older adults.

For validity of the composite questionnaire, a discussion with the care takers of older adults at one of the residences was done to check on the relevance of the questions was done. Furthermore the questionnaire was discussed with the study coordinator and coordinator of the Gerontology postgraduate module at the physiotherapy Department at the University of the Western Cape to check on its relevance to the objectives of the study.

A pilot study was carried out on six older adults not included in the main study. This was done to check for clarity, understanding and time taken to complete the questionnaire. Grammatical and spelling errors were corrected after the pilot study. An option; never

attended school, was added to the questions regarding educational attainment because it was identified that there are older adults who did not attend formal education yet the option was not included.

3.7 TRANSLATIONS

The instrument was translated from English into Kinyarwanda by a professional translator (Appendix A1). Further to ensure validity, the instrument was then back-translated into English by an independent translator. The translated questionnaire was checked for clarity and understanding of the questions by older adults in the pilot study. This further helped to estimate the duration of the interview. The information participation sheet and informed consent were also translated from English to Kinyarwanda (Appendices G1 & H1 respectively).

3.8 PROCEDURE

Ethical clearance and permission was obtained from the Senate Research Grant and Study Leave committee and Senate Higher Degrees committee of the University of the Western Cape (Appendix B). Permission from the National Ethical Committee in the Ministry of Health of the Republic of Rwanda was also sought and granted (Appendices C & D). Furthermore permission was also obtained from residential homes' management (Appendices E & F) and the researcher introduced himself and explained the aims and objectives of the study to the participants. Participants were informed that participation

was voluntary and they could withdraw at any time without giving any reason (Appendix G). Those who volunteered signed a consent form (Appendix H).

Interviews with the participants were arranged at a suitable time. The interview was carried out in meeting rooms of the respective institutions. The researcher administered the instrument to one participant at a time and recorded the responses. The researcher was assisted by two previously trained research assistants.

3.9 DATA ANALYSIS

The data which was collected was nominal in nature. Data was numerically coded and captured in statistical package for social sciences (SPSS) version 15.0. Descriptive statistics was employed to summarise the demographic data of the study sample. The demographic data was presented using frequency tables and was expressed as percentages, means and standard deviations. Inferential statistical analysis was done to determine the association between socio-demographic factors, psycho-social factors, and physical activity among older adults. Chi-square tests were used to test for significance. Alpha level was set at 0.05.

3.10 ETHICAL CONSIDERATIONS

Ethical clearance was obtained from Senate Research Grant and Study Leave Committee at the University of the Western Cape (appendix B). Ethical clearance was also obtained from the Ethical Committee of the Ministry of Health of the Republic of Rwanda (appendices C & D). The researcher explained the aims, objectives and nature of the

study to the participants prior to participation in the study. Written permission from the residences' administration (appendices E & F) was also given. The researcher further explained to the participants that participation was voluntary and withdrawal from the study was possible at any time without giving any reason (Appendices G). Those who agreed to participate in the study signed a consent form (Appendices H). Confidentiality and anonymity was assured regarding the participants' identity and information they provided. Codes were used instead of names. Results will be shared with the residence management.

3.11 SUMMARY OF THE CHAPTER

This chapter has outlined the methodology of the study, research design, it describes the research setting, the sample population used and inclusion and exclusion criteria. The study instrument, its reliability and validity and the motivation for the pilot study and data analysis was highlighted. The results of the analysis were tabulated and presented in chapter four.

CHAPTER FOUR

RESULTS

4.1 INTRODUCTION

This chapter contains the results of the study. Results will be presented in tables under the following headings: socio-demographic characteristics of older adults, physical activity levels and associated factors with physical activity levels in Rwanda. The results will be complimented with graphs and tables.

4.2 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF STUDY SAMPLE

Sixty- three (63) residents in the institutions for the elderly met the inclusion criteria and all of them (100%) consented to participate in the study. The mean age of the participants was 71 years (SD = 9.82; range = 55-101 years) and more than half (58.7%) of the participants were females as illustrated in table 4.1. Furthermore the majority of the participants were widowed (58.7 %) and reported alcohol consumption (60.3 %). The majority (98.4 %) of the participants were single, i.e either never married, divorced or widowed. Almost two-thirds (65.1 %) of the study sample were from the urban areas of Rwanda.

Table 4.1 Selected socio-demographic characteristics of the sample (n= 63)

Variable		Number of participants (n)	Percentage (%)
Gender			
	Male	26	41.3
	Female	37	58.7
Marital status			
	Never married	8	12.7
	Married	1	1.6
	Divorced	17	27
	Widowed	37	58.7
Educational level			
	Never attended	37	58.7
	Primary	24	38.1
	3years of secondary	1	1.6
	6years of secondary	1	1.6
Setting			
	Urban	41	65.1
	Rural	22	34.9
Age group			
	55-59	6	9.5
	60-64	5	7.9
	65-69	17	27.0
	70-74	16	25.4
	75-79	9	14.3
	80-84	6	9.5
	85-89	4	6.3

4.3 LEVELS OF PHYSICAL ACTIVITY AMONG PARTICIPANTS

To establish the levels of physical activity, the guidelines of the American College of Sports Medicine and American Heart Association (ACSM & AHA) were used. The ACSM and AHA recommend that older adults should engage in physical activity at least five or more times a week at moderate or vigorous intensity for 30 minutes, to be classified as physically active (ACSM Position Stand, 2000). Those who were engaging in physical activity three to four times a week at moderate intensity were classified as

being insufficiently active and those who were engaging in physical activity on two or less occasions during the week were classified as sedentary.

Over one-third (38.1%; n= 24) of the sample was classified as sedentary and 44.4% (n= 28) as physically active as illustrated in figure 4.1.

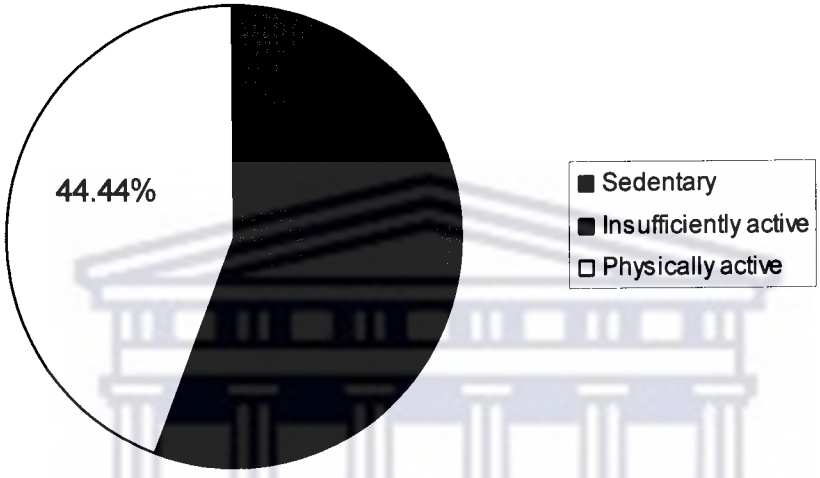

Figure 4.1 Percentage of participants classified into physical activity categories (n= 63)

Other activities that participants engaged in during a normal week were attending church, club/group meetings, visiting friends other than those they live with and doing voluntary work as illustrated in table 4.2. The majority of participants (92.1%, n= 58) reported attending church as an activity in the two weeks prior to the study. Furthermore less than one-tenth (7.9 %, n= 5) attended club or group meetings as illustrated in table 4.2.

Table 4.2 Sedentary activities participants were involved in (N=63)

Activity	Frequency(n)	Percentage (%)
Attend church	58	92.1
Visiting friends	10	15.9
Attend club/meetings	5	7.9
Do voluntary work	2	3.2

*Participants could choose more than one activity.

4.4 ASSOCIATION OF SOCIO-DEMOGRAPHIC FACTORS AND PHYSICAL ACTIVITY

The association between different socio-demographic factors and the levels of physical activity are summarized in table 4.3.

Gender: More females (54.1%) were classified as being physically active compared to males (30.8%). This difference was not statistically significantly (P> 0.05). A higher prevalence of males were considered insufficiently active (23.1 %) and sedentary (46.2 %) as opposed to females.

Table 4.3 socio-demographic factors associated with physical activity (N=63)

Variables	Sedentary	Insufficiently physically active	Physically active
Gender			
Males	46.2% (n=12)	23.1% (n=6)	30.8% (n=8)
Females	32.4% (n=12)	13.5% (n=5)	54.1% (n=20
Marital status			
Married	100% (n=1	0% (n=0)	0% (n=0)
Divorced	35.3% (n=6)	5.9% (n=1)	58.8% (n=10)
Widowed	37.8% (n=14)	24.3% (n=9)	37.8% (n=14)
Never married	37.8% (n=3)	12.5% (n=1)	50% (n=4)
Educational level			
Never attended	40.5% (n=15)	10.8% (n=4)	48.6% (n=18)
Primary	29.2% (n=7)	29.2% (n=7)	41.7% (n=10)
3 years of secondary	100% (n=1)	0% (n=0)	0% (n=0)
6 years of secondary	100% (n=1)	0% (n=0)	0% (n=0)
Location of residence			
Urban	36.6% (n=15)	14.6% (n=6)	48.8% (n=20)
Rural	40.9% (n=9)	22.7% (n=5)	36.4% (n=8)
Age* category/years			
Below 65	25.0% (n=4)	12.5% (n=4)	62.5% (n=10)
66-75	37.5% (n=12)	12.5% (n=4)	50.0% (n=16)
Above 75	53.3% (n=8)	33.3% (n=5)	13.3% (n=2)

* Indicates significance at P= 0.05 level of significance

Marital status: The only participant that was married was considered sedentary. A higher prevalence of participants that were divorced (58.8 %) or never married (50 %) than those widowed (37.8 %) were considered physically active.

Educational level: Almost half of the participants who have never attended school (48.6 %) were considered physically active. No statistical significance was found for the association between physical activity levels and educational levels (P> 0.05).

Location of residence: A higher prevalence of participants whose institution was located in the urban area (48.8 %) than those in rural area (36.4 %) were considered physically active. No statistical significance was found for the association between physical activity and location of residence (P> 0.05).

Age: A statistically significant higher prevalence of participants in the below 65 years (62.5 %) and 66 – 75 years categories (50.0 %) were considered physically active than those above 75 years (13.3 %) (P< 0.05). Furthermore participants classified as physically active had a mean age of 67.36 years (SD= 6.550) and those classified as sedentary a mean age of 75.08 (SD= 10.189) as illustrated in table 4.4.

Table 4.4 Mean age of participants according to physical activity level (n=63)

Physical activity levels	Mean age	Number (n)	Std. Deviation
Sedentary	75.08	24	10.786
Insufficiently active	72.36	11	11.613
Physically active	67.36	28	6.550

4.5 ASSOCIATION OF OTHER FACTORS WITH PHYSICAL ACTIVITY

Factors that have been shown in literature that could possibly be associated with levels of physical activity among the elderly were examined. These factors included fear of falling, psychological distress and substance use. The association between these factors and the levels of physical activity are summarized in table 4.5.

Table 4.5 Other selected factors associated with physical activity (n=63)

Variables	Sedentary	Insufficiently active	Physically active
Fear of falling			
not confident	52.4% (11)	23.8% (5)	23.8% (5)
fairly confident	50% (5)	20% (2)	30% (3)
confident	24.1% (7)	13.8% (4)	62.1% (18)
completely confident	33.3% (1)	0% (0)	66.7% (2)
Psychological distress			
"more distress"	44.7% (21)	17% (8)	38.3% (18)
"less distress"	18.8% (3)	18.8% (3)	62.5% (10)
Substance use			
alcohol use*			
yes	23.7% (9)	21.0% (8)	55.3% (21)
no	60% (15)	12% (3)	28 % (7)
smoking			
yes	0% (0)	0% (0)	100% (2)
no	39.4% (24)	18% (11)	42.6% (26)

* Indicates significance at P= 0.05 level of significance

4.5.1 Fear of falling

Participants were categorized according to how confident they feel doing ADL without the fear of falling using the Modified Falls Efficacy Scale, a theoretical scale ranging from 1 (not confident at all) to 10 (completely confident). Participants were categorized into four groups according to their average score. These categories included not confident (1-4 score), fairly confident (5), confident (6-9) and completely confident (10).

In total more than half (50.8 %, n= 32) of the participants were confident that they could perform normal ADL without falling as illustrated in figure 4.2. These participants had a lower mean age (67.69; SD= 6.5065 and 61.67; SD= 9.815) respectively compared to

those that were not confident (75.81; SD= 9.070) that they could perform normal ADL without falling.

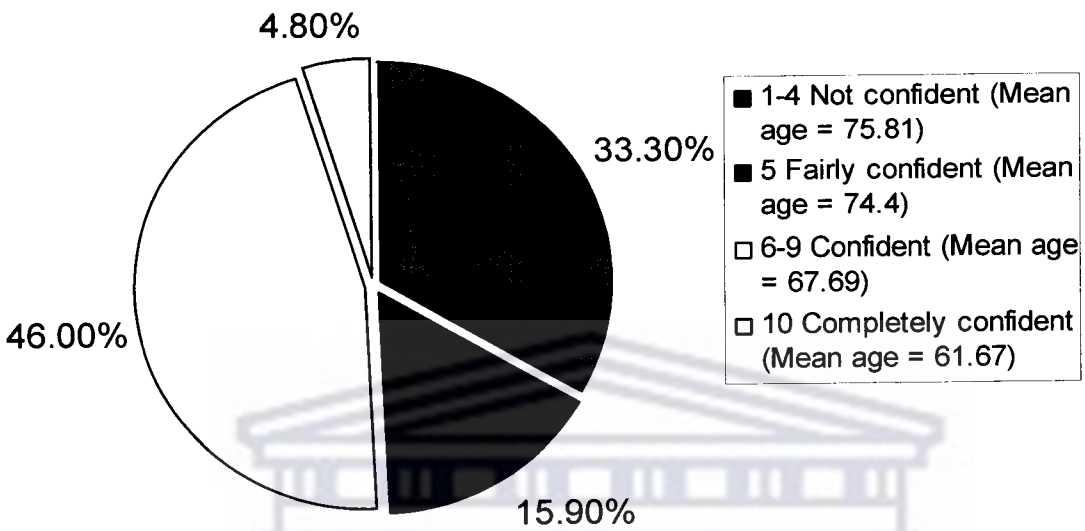

Figure 4.2 percentage of participants feeling confident/not confident in completing normal ADL without falling (N= 63)

A higher prevalence of participants who were afraid of falling (52.4 %) than those who were not afraid of falling (33.3 %) were classified as sedentary. The association between fear of falling and physical activity levels were not statistically significant ($P > 0.05$).

4.5.2 Psychological distress

Participants were classified according to how they feel/perceive their well being, on a theoretical scale, those scoring six and less were classified as "less distressed" while those who score more than six were classified as "more distressed".

Of the total sample 74.6 % (n= 47) of participants were classified as "more distressed" and 25.4 % (n= 16) as "less distressed" as illustrated in figure 4.4. Participants classified as "more distressed" had a lower mean age (70.95, SD=8.471) than those classified as "less distressed" (71.29, SD=9.815).

A higher prevalence of participants considered "less distressed" (62.5 %) than those considered "more distressed (38.3 %) were categorized as physically active. The association between physical activity and psychological distress was not found to be statistically significant (P >0.05).

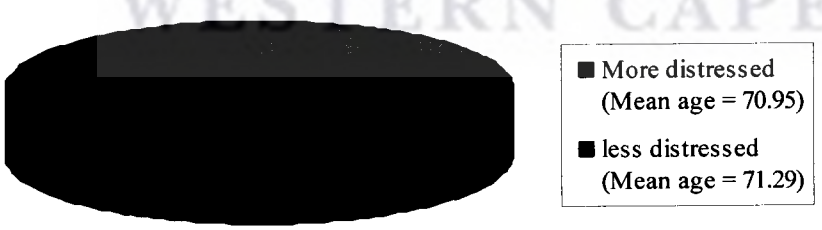

Figure 4.3 Percentage of participants psychological distress (n= 63)

4.5.3 Substance use

Almost three quarters of the participants (60.3%) reported using alcohol as illustrated in figure 4.4. Participants reporting alcohol use had a lower mean age (69.66, SD= 7.455) than those reporting no alcohol use (73.48, SD=12.410). More than half (55.3 %) of the participants who reported alcohol use were categorized as physically active compared to those who reported no alcohol consumption (23.7 %).This association was statistically significant (P< 0.05).

A small percentage (3.2 %) of the total sample reported smoking. Participants reporting smoking had a lower mean age (63.50, SD= 2.121) than those reporting no smoking (71.43, SD= 9.872). All participants who reported smoking were classified as physically active (100 %) compared to those who reported no smoking (42.6 %) however the relationship was not statistically significant (P> 0.05).

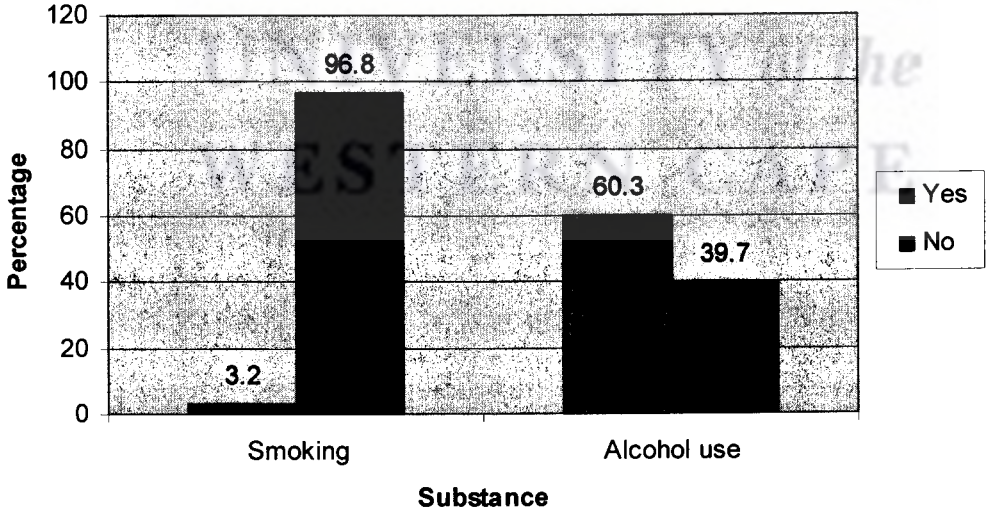

Figure 4.4: Percentage prevalence of substance use (n=63)

4.6 SUMMARY OF THE CHAPTER

The current study aimed to establish the levels of physical activity and the factors associated with it, among older adults in the Southern Province, Rwanda. A significant number of older adults were found to be physically inactive. Factors that were associated with physical activity among older adults were highlighted.

The next chapter will present a discussion of the data outlined in this chapter

CHAPTER FIVE

DISCUSSION

5.1 INTRODUCTION

The aim of this study was to establish the levels of physical activity among older adults in the Southern Province of Rwanda. Furthermore the study aimed to identify the socio-demographic factors and selected other factors associated with physical activity among older adults in the Southern province of Rwanda. This chapter discusses the findings of the current study and compares the findings with similar published studies.

5.2 PHYSICAL ACTIVITY LEVELS AMONG STUDY SAMPLE

Regular physical activity has been linked to a wide range of physical and health benefits. The American College of Sports Medicine and the American Heart Association suggested that to be classified as physically active, an individual needs to engage in moderate physical activity for 30 minutes per day at least five days per week (ACSM, 2000). The present study found that 44.4% of all older adults were classified as sufficiently physically active and one-third (38.10 %) were classified as sedentary. This is of great concern as physical inactivity has become a major health concern, contributing to the non-communicable disease epidemic globally. Regular physical activity has been associated with a number of health benefits in the elderly people. These benefits for older people include improved fitness and quality of life, prevention of osteoporosis and a reduction in the risk of falling (Gillespie et al., 2002).

The overall prevalence of physical activity among elderly people in the present study (44.44 %) was considerably lower than the 70-80 % that was found by Koltyn (2001) among older adults in Madison; Australia. The gap between the levels of physical activity observed among elderly Rwandese and Australians is expected due to the fact that the latter is a developed country, thus senior citizens might be exposed to better facilities and have better knowledge on the health benefits of physical activity participation. Although limited data on physical activity levels among the elderly in Africa exist, Banata (2003) also reported a prevalence of 87.8 % of inactive elderly in Ethiopia. The observed difference between the current study and that of Banata (2003) might be attributed to the difference in the research settings. In the Ethiopian study participants were community dwellers while the participants in the present study were institutional elderly. Cultural differences might also have attributed to these differences. Cultural influences in the realm of physical activity have been reported by the World Health Organisation (2002a) in its policy framework.

Although the current study did not compare the levels of older adults in institutions and those in the community, research has indicated that older women living in assisted care were less physically active than community dwelling older women (Koltyn, 2001). The present study is in agreement with the results of a study carried out in Rwanda among working adults of different age strata which showed that by 51 years of age the participants were physically inactive. The difference in the physical activity levels among senior citizens in developed and developing countries may be contributed to by lack of infrastructures to engage in physical activity in developing countries and the culture and

beliefs in some African countries where aging means rest (WHO, 2002a). This partly might explain the observed difference in physical activity prevalence among elderly Australian women (Koltyn, 2001) and the present studys' low prevalence of physical activity (54.1 %) among females. It is believed by the researcher that though the study did not collect data on the health conditions, factors like beliefs by the older adults that illness and frailty are barriers to participation and exercising could result in physical harm. This is in accordance to Haralambous, Osborne and Fearn (2003) who contends that the normal health declines and the perceived inevitability of physical decline are used to justify non participation.

5.3 FACTORS ASSOCIATED WITH PHYSICAL ACTIVITY AMONG OLDER ADULTS

5.3.1 Gender

Scientific evidence consistently shows that men are considered more physically active than women (Eyler et al., 2002; Stone et al., 2002). Other research reporting on physical activity levels among community dwelling older adults have also shown that males are more active than females (Marks, Lambert, Jun & Song, 2008; Paffenbarger et al., 1993; King et al., 1992). The present study however found that females (54.1 %) were more physically active compared to males (30.8 %). These discrepancies could possibly be explained by the fact that the current study was carried out in an institutional setting where the residents are restricted from moving out of the boundary of the residence and the work done at the residence is typical domestic work which in the Rwanda context is for women specifically.

In addition it is believed that women are more aware of their health than men, hence leading to improved knowledge regarding their well being as stipulated by Newson and Kemps (2007). The higher prevalence levels of physical activity among females might thus be attributed to their possible increased knowledge on the health benefits of physical activity compared to males.

Kritz-Silverstein, Barrett-Connor, & Corbeau, (2001) also reported that Mexican female residents were more likely to be physically active than males living in assisted care facilities. This could be compared to institutional care facilities in Rwanda. Though the prevalence of physically active older adults is lower in the current study (females = 54.1; males = 30.8 %) than that of Kritz-Silversten et al., (2001) (females = 65.03 %, males = 34.97 %) across gender, the pattern is the same. The difference in the levels of physical activity observed above might be explained by the difference in the type of study and the methodology employed in the respective studies the above was a randomized controlled study while the current study was quantitative cross-sectional study using descriptive design.

5.3.2 Age

Various researchers have reported on a decline in physical activity with advancing age (Moriarty, Kobau, Zack & Zahran, 2005; Armstrong, Bauman & Davies, 2000). This was highlighted in the present study as those classified as physically active had a significantly lower mean age (67.36 years) than those classified as sedentary (75.08). This decrease in

physical activity participation with age observed among older adults in Rwanda is consistent with the results from a study by Armstrong, Bauman & Davies (2000) who contends that physical activity participation of Australian adults' decreases with age until age 60 years. This decline in physical activity levels with age is of concern as older adults will loose out on the benefits of physical activity especially for the older adults.

The decline of activity with age of the present study is also consistent with that of Moriarty et al., (2005). Though the results of this study follows a similar trend as that of Mariarty et al. (2005) the prevalence varies. Bopp et al., (2006) contended that younger older adults were more engaged in physical activity to levels that would suffice health benefits compared to their older counterparts irrespective of gender. This shows that older adults need special attention so as to counteract the chronic disease pandemic that is associated with old age and exacerbated by physical inactivity. This is a serious public health concern for this poorly attended to population segment.

5.3.3 Location of institution

Various researchers have found that older adults living in rural areas are generally more likely to be physically active as compared to people living in urban areas (Haralambous, Osborne & Fearn, 2003; Pitsavos, Panagiotakos, Lentzas & Stefanadis, 2005). However the current study found that a higher prevalence of urban older adults (48.8 %) was considered physically active compared to rural dwellers (36.4 %). Lim and Taylor (2005) found that living in a rural area was independently associated with adequate physical activity among older people in New South Whales, Australia. Lim and Taylor (2005) also

reported this association between residential setting and physical activity participation without adjusting for other factors like language spoken, suffering from diabetes and fruit intake which are known to influence physical activity participation.

The results of the current study differ from research conducted in Greece by Pitsavos et al. (2005) that showed that living in a rural area was associated with an increased likelihood of taking part in physical activity. The observed difference between the trend in physical activity participation in Rwanda and Greece might be explained by the methodological differences in the two studies. Furthermore, these discrepancies can be explained by the fact that developing countries like Rwanda have no areas available for exercising compared to developed countries such as Greece (Pitsavos et al. 2005).

5.3.4 Marital status and physical activity

Pettee et al. (2006) have stated that marital status is an important determinant for physical activity participation. It has been stated that spousal social support may increase levels of physical activity. Several intervention studies exemplify this relationship in both exercise (Wallace, Raglin, & Jastremski, 1995; O'Reilly & Thomas, 1999) and cardiac rehabilitation. The present study however found that single participants (i.e either never married, divorced or widowed) were more likely to be physically active than married ones, irrespective of gender or age. These findings are consistent with that of Lim and Taylor (2004) who also found single participants to be more physically active. The findings of Pitsavos et al. (2005) concur with the present study in terms of never married

participants. Higher levels of physical activity among single individuals could be explained by the fact that they might have less family responsibilities.

Widowed or divorced participants in the study by Pitsavos et al. (2005) however were less likely to be considered physically active than in the present study. Discrepancies between Pitsavos et al. (2005) and the present study could possibly be attributed to cultural differences of the two settings/studies. Never married/divorced/widowed older adults lead a more or less same social lifestyle in the Rwandan context.

5.3.5 Physical activity and psychological distress

Studies have shown that older adults who are frequently involved in brisk walking, jogging and other brisk exercise were less likely to report depressive symptoms (Courneya & McAuley, 1995). Kritz-Silverstein et al. (2001) however found no statistically significant longitudinal effects of physical activity on psychological distress.

In the present study a higher prevalence of participants who were classified as "less distressed" were physically active (62.5 %). Furthermore the study shows that older adults were categorized as "more distressed" were more likely to be sedentary (44.7 %). These results are in agreement with that of Fox (1999) which revealed that British adults who frequently take part in physical activity are less likely to present with symptoms of psychological distress. Fox (1999) contends that there is an inverse association between physical activity and depressive symptoms and advocates for use of physical exercise for treatment of clinical depression. It has been shown that low levels of physical activity may lead to depressive symptoms or vice versa (Strawbridge, Deleger, Roberts &

Kaplan, 2002). Therefore one could not conclude on the cause effect relationship in the current study because it did not intend to investigate cause-effect relationship. Strawbridge et al. (2002) found that physical activity was protective for both prevalent and incident depressive symptoms, therefore from the results of the present study the low levels of physical activity participation may predispose the residents to psychological symptoms hence likelihood of further decreased physical activity participation. From the results of the current study there is a possibility of increasing prevalence of psychological symptoms among residents of institutions of old age care in Rwanda owing to low levels of physical activity evident among current residents. However, cognizance must be taken of the fact that the causes of psychological distress seems to be multi-factorial.

5.3.6 Fear of falling and physical activity

Fear of falling is seen to be associated with reduced physical activity among older adults and among nursing home residents (Bath & Morgan, 1998). Various researchers have also stated that fear of falling is more prevalent among older adults living in institutions than community dwelling older adults (Bath & Morgan, 1999). However physical activity participation is one of the strategies used to prevent fear of falling among elderly population. Research conducted in Canada show that up to 70% of elderly persons refrain from exercising because of fear of falling (Flint, 2003). In some cases, individuals become housebound as a result of their fear. Activity restriction is in itself a risk factor for falls because it can lead to muscle atrophy, de-conditioning and poor balance.

The current study found that participants who were completely confident of not falling were more likely to be classified as physically active (62.5%) than sedentary (33.3 %). This study also established that more than a half of the participants (52.4 %) who fear falling while performing their daily activities were sedentary compared to 23.8 % who are physically active. The results of the present study is comparable to that obtained by Newson and Kemp (2007) who reported fear of falling as a barrier to physical activity participation among British elderly population. However the British elderly (50.0%) who fear falling were more likely to be physically active than their Rwanda counterparts (33.3%). This discrepancy could be explained by the increased likelihood of the presence of adopted physical environments in developed countries to assist older adults carry out their activities without the risk of falling. These might include bars alongside corridors at residences which are lacking in institutions of old age care in most developing countries. Lack of facilities/knowledge of factors acting as barriers to exercise can also be an explanation of the sedentary lifestyle among older Rwandans. However other factors such as uncorrected poor sight and other age related physical impairments and cultural beliefs in African countries could also lead to sedentary lifestyles among older adults in Rwanda.

5.3.7 Physical activity and Substance use

It has been established by research that substance use like alcohol consumption and smoking are associated with low levels of physical activity both in young and old adults (Shea et al., 1991; Kressig et al., 2001). Studies have also shown that alcohol drinking is negatively correlated with the physical activity participation by older adults (Kim et al., 2004; Kaplan et al., 2001; Flint, 2003). Sallis (1993) has stated that health behaviours

such as cigarette smoking, dietary habits, and alcohol consumption are not consistently related to physical activity habits, but it appears that people selectively choose their health behaviours.

In the present study all the participants (100%) who reported smoking were physically active. These results are similar to that reported by Pitsavos et al., (2005) in which smoking was independent of physical activity. However this comparison should be made with caution as the methodology of the two respective studies differs. Further caution should be employed as a very small number of participants reported current smoking. This reported behavior might not be entirely reliable since residents in the present study are forced to refrain from smoking but might be still smoke in their rooms or outside the residence.

These results are consistent with the outcome of a study done by DeRuiter, Faulkner, Cairney, and Veldhuizen (2008) which showed that physically active smokers represented almost one quarter of the smoking population compared with physically inactive smokers. DeRuiter et al. (2008) commented that physically active smokers were more likely to have attempted smoking cessation. This is promising as it highlights that promoting physical activity could possibly assist with smoking cessation. It is also worthy noting that in Rwandese culture for an aged person smoking is a sign of advanced age and seen to promote social interaction among age mates.

It was established that alcohol consumption was significantly associated with physical activity (DeRuiter et al., 2008). Most participants who consumed alcoholic beverages in the present study were more likely to be physically active (55.3%) than sedentary (23.7%). This was consistent with the results of a study in Finland which showed that older adults who consumed alcohol and wine were more likely to participate in physical activity than those who did not after controlling other confounding factors (Pedersen, Heitmann, Schnohr & Grønbaek, 2007). Bourque, Ouellette, Singleton and Béland (2005) also found that among 65 year old Acadians those who drink alcohol beverages reported significantly more physical activity.

5.4 SUMMARY

The discussion dealt with the major findings of this study; the levels of physical activity and the relationship between different factors associated with physical activity among the elderly, at Saint Aloys and Gisagara homes for the elderly in Rwanda. Through the discussion the chapter interprets the results of the study, compares and contrasts the findings of the current study with similar studies, and highlights the possible reasons for observed trend in the results in comparison with other studies.

The next chapter concludes the present study by presenting a summary and recommendations.

CHAPTER SIX

SUMMARY, CONCLUSSION AND RECOMMENDATIONS OF THE STUDY

6.1 INTRODUCTION

The current study aimed to establish the factors associated with physical activity and the physical factors associated with it among older adults in Rwanda. This chapter draws conclusions to the study, recommends areas of further research and highlights the limitations of the study.

6.2 SUMMARY AND CONCLUSSION

The main concern of the world in the 21st century has been the considerable increase in the absolute and relative numbers of older people in both the developed and the developing world. Regular physical activity has been associated with many health benefits in all age groups. The benefits of physical activity for older people include improved fitness and quality of life, reduced risk of colon cancer, prevention of osteoporosis and a reduction in the risk of falling. The purpose of this study was to determine the levels of physical activity and the factors associated with it among older adults in the Southern Province of Rwanda. The levels of physical activity among older adults in two institutions in the Southern Province of Rwanda were measured and the factors associated with it identified.

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Literature highlighted that older adults in developing nations are increasingly becoming physically active due to the increased awareness of the benefits of living a physically active life even in later life and availability of infrastructure to exercise however this does not go without barriers like unsafe neighborhoods. However there is limited data on the physical activity levels among senior citizens living in developing countries however the little available show that they are sedentary.

A quantitative cross-sectional study design was chosen. The study population was older adults from Saint Aloys and Gisagara homes for the elderly. A sample of 63 participants aged 55 years and above met inclusion criteria Descriptive and inferential statistics were excuted on the collected data. A structured interview questionnaire consisting of various sections was used to collect data. This questionnaire was adapted from reliable and valid questionnaires.

Descriptive statistics were used to summarise the levels of physical activity and socio-demographic factors. Inferential statistics were used to test the association between various factors and the levels of physical activity.

The study sample included males (41.3 %) and female (58.7 %) with a mean age of 71 years (SD=9.82). The majority (58.7 %) of the study sample never attended school and were windowed.

Guidelines from the American College and Sports Medicine and American Heart Association (ACSM & AHA) were used to establish levels of physical activity. More than a third (38.1 %) of the sample were classified as sedentary. Age and alcohol use was found to be significantly associated with levels of physical activity.

It is also evident that the participants' levels of physical activity are generally not sufficient to suffice health benefits considering the guidelines of the American College of Sports Medicine and American Heart Association. Therefore there is need to carry out health promotion programme to increase physical activity participation.

6.3 LIMITATIONS OF THE STUDY

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

1. The data of this study was based on self-report and is therefore subject to several sources of errors. Recall bias of activities may represent sources of errors. Self-report surveys are however common in studies of this nature and are generally considered reliable.

2. Cross-sectional data may consistently describe patterns of association but not causality. An older adult participating in physical activity will not necessarily continue to do so. Thus caution should be employed when interpreting the results of a cross-sectional study when longitudinal data is not present.

3. Data were drawn from older adults living in institutions, therefore the results cant be generalized to all older adults in Rwanda.

4. Several institutions for older adults in Rwanda are housing individuals for other reasons than old age. Thus several individuals did not meet the inclusion criteria for the study resulting in a small sample size.

6.4 RECOMMENDTIONS

1. Physical activity classes should be conducted at an early stage in life, as early as primary school level so as to instill the culture of leading a physically active life even in later life. Research has found a positive relationship between youth participation in physical activity and physical activity participation in later life.
2. Education campaigns should be tailored to inform older adults living in institutions of the benefits of physical activity to both their physical and mental health. This would help promote participation in physical activity. There is need to promote community/home based rehabilitation and health promotion aimed at promoting physical activity among Rwandans in general but more precisely in institutions of elderly care.
3. The study results should form a cornerstone for the physical activity programme in the old age homes in Rwanda since it has pointed out the levels and possible barriers for physical activity participation.
4. Further studies are needed to be conducted in the domain of physical activity amongst the elderly residential care and those living in the mainstream community in Rwanda.
5. The Ministries of Health and those responsible for social welfare should put in place policies and programmes that encourage inactive people to become more

active as they age and provide them with opportunities to do so. It is particularly important to provide safe areas for walking and to support culturally-appropriate community activities that stimulate physical activity and are organized and led by older people themselves.

6. It is important that clinicians who care for older people with health problems such as diabetes and arthritis provide advice on the possible benefits of physical activity as a routine part of clinical care.

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APPENDICES

Appendix A

QUESTIONNAIRE

SECTION A

Demographic information

Code :

Gender : Male ☐ female ☐

Age :

Marital status: Married ☐ Divorced ☐ widowed ☐ never married ☐

Alcohol use: Yes ☐ No ☐

Smoking: Yes ☐ No ☐

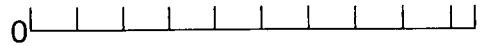
Educational Level:

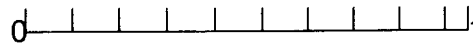
A: Primary school ☐ B: 3 years of secondary school education ☐ C: Six years of secondary education ☐ D: Post secondary education ☐

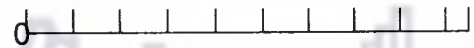
SECTION B

On a scale of 0 to 10, how confident are you that you can do each of these activities without falling, with 0 meaning "not confident/no sure at all", 5 being "fairly confident/fairly sure", and 10 being "completely confident/completely sure"?

11. Using public transport 0 10

12. Crossing roads  10

13. Light gardening/ hanging clothes  10

14. Using front or rear steps at home  10

Average score/item rated=...../

=.....

SECTION C

The following section asks you; during the past month, about how often did you feel...?

1: So sad that nothing could cheer you up:

a; All of the time b; Most of the time c; Some of the time d; A little of the time e; None of the time.

2: Nervous

a; All of the time b; Most of the time c; Some of the time d; A little of the time e; None of the time.

3: Restless or Fidgety

a; All of the time b; Most of the time c; Some of the time d; A little of the time e; None of the time.

4: Hopeless

a; All of the time b; Most of the time c; Some of the time d; A little of the time e; None of the time.

5: Worthless

a; All of the time b; Most of the time c; Some of the time d; A little of the time e; None of the time.

6: Everything was an effort

a; All the time b; Most of the time c; Some of the time d; A little of the time e; None of the time.

SECTION D

This questionnaire is about activities that you may have done in the past 4 weeks. The questions on the following pages

INSTRUCTIONS

If you DID the activity in the past 4 weeks:

Step 1 Check the YES box.

Step 2 Think about how many TIMES a week you usually did it, and write your response in the space provided.

Step 3 Circle how many TOTAL HOURS in a typical week you did the activity.

Here is an example of how Mrs. Jones would answer question 1: Mrs. Jones usually visits her friends Maria and Olga twice a week. She usually spends one hour on Monday with Maria and two hours on Wednesday with Olga. Therefore, the total hours a week that she visits with friends is 3 hours a week.

In a typical week during the past 4 weeks, did you....						
1. Visit with friends or family (other than those you live with)? YES How many TIMES a week?__ NO	Less than 1 hour	1-2½ hours	3-41/2 hours	5-61/2 hours	7-81/2 hours	9 or more hours

If you DID NOT do the activity:
Check the NO box and move to the next question

In a typical week during the past 4 weeks, did you …							
1. Visit with friends or family (other than those you live with)? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
2. Do volunteer work? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
3. Attend church or take part in church activities? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
4. Attend other club or group meetings? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
5. Use a computer? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
6. Dance (such as square, folk, line, ball room) (do not count aerobic dance here)? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours

7. Do woodworking, needlework, drawing, or other arts or crafts? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
8. Attend a concert, movie, lecture, or sport event? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
9. Play cards, bingo, or board games with other people? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
10. Play a musical instrument? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
11. Read? **YES** How many TIMES a week _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
12. Do heavy work around the house (such as Washing windows, cleaning gutters) **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
13. Do light work around the house (such as Sweeping or vacuuming)? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours

14. Do heavy gardening (such as spading, raking) **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
15. Do light gardening (such as watering plants)? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
16. Jog or run? **YES** How many TIMES a week?_____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
17. Walk fast or briskly for exercise (do not count walking leisurely or uphill)? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
18. Walk to do errands (such as to/from a store or to take children to school (count walk time only)? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
19. Walk leisurely for exercise or pleasure? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
20. Ride a bicycle or stationary cycle? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours

21. Do stretching or flexibility exercises? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours
22. Do moderate to heavy strength training (such as hand-held weights of more than 5 lbs., weight machines, or push-ups)? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ Hours	7-8½ hours	9 or more hours
23. Do light strength training (such as hand-held weights of 5 lbs. or less or elastic bands)? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ Hours	7-8½ hours	9 or more hours
25. Do general conditioning exercises, such as light calisthenics or chair exercises (do not count strength training)? **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ Hours	7-8½ hours	9 or more hours
24. Do other types of physical activity not previously mentioned (please specify)? _____ **YES** How many TIMES a week? _____ **NO**	How many TOTAL hours a week did you usually do it?	Less than 1 hour	1-2½ hours	3-4½ hours	5-6½ hours	7-8½ hours	9 or more hours

Thank You

Appendix A1

QUESTIONNAIRE Y'IKINYARWANDA

IGICE CYA 1

Umwirondoro

1. Code (Inumero) :

Igitsina Gabo☐ Gore☐

2. Imyaka y'amavuko:

3. Indangamimerere: urubatse☐ Waratanye☐ Umupfakazi☐

Ntiyigeze ashaka☐

4. Unywa inzoga Yego☐ Oya☐

5. Unywa Itabi yego☐ Oya☐

6. Amashuli wize A: Amashuli abanza ☐ B: Amashuli 3 yisumbuye☐

C: Amshuli 6 yisumbuye☐ C: Kaminuza☐

IGICE CYA 2

IKIGERERANYO KUVA KURI 0 KUGERA KU 10 KIREREKANA UKO USHOBORA GUKORA IBI BIKORWA NTA MPUNGENGE ZO KUGWA,
KURI 0 BISOBANURA KO NTAKIZERE/ CYANGWA NTA KIZERE NAMBA, 5 KUBA WIYIZEYE MURUGERO, 10 KUBA WIYIZEYE NEZA
NTA KIZERE/CYANGWA NTA KIZERE NA MBA, 5 KUBA WIYIZEYE MU RUGERO, 10 KUBA WIYIZEYE NEZA

ICYITONDERWA
* NIBA WARACIKIRIJEMO HAGATI IGIKORWA CYAWE KUBERA GUTINYA KUGWA SHYIRAHO
0
* NIBA WARAHAGARITSE IGIKORWA CYAWE BURUNDU BITEWE N`INTEGE NKE, HASIMBUKE
NIBA
UDAKORA IGIKORWA CYAWE BITEWE N`IZINDI MPAMVU,UZUZA ICYO KIGERANYO UKURIKIJE UKO WUMVA WAGIKORA UNO MUNSI

	Ntiwiyizeye na gato					wiyizeye mu rugero				Uriyizeye neza
1 KWAMBARA NO KWIYAMBURA	0	1	2	3	4	5	6	7	8	9	10
2 GUTEGURA IFUNGURO RYOROHEJE	0	1	2	3	4	5	6	7	8	9	10
3 KWIYUHAGIRA	0	1	2	3	4	5	6	7	8	9	10
4 KWICARA CYANGWA SE GUHAGURUKA MU NTEBE	0	1	2	3	4	5	6	7	8	9	10
5 KUJYA CYANGWA SE KUVA MU BURIRI	0	1	2	3	4	5	6	7	8	9	10
6 GUKINGURA URUGI CYANGWA SE KWITABA TELEPHONE	0	1	2	3	4	5	6	7	8	9	10
7 GUTEMBERA MU NZU YAWE	0	1	2	3	4	5	6	7	8	9	10
8 KUJYA KU MUSARANE	0	1	2	3	4	5	6	7	8	9	10
9 GUTUNGANYA INZU BYOROHEJE	0	1	2	3	4	5	6	7	8	9	10
10 GUHAHA UTUNTU	0	1	2	3	4	5	6	7	8	9	10

DUCYE

11 GUTEGA TAXI YA RUSANGE	0	1	2	3	4	5	6	7	8	9	10
12 KWAMBUKIRANYA UMUHANDA	0	1	2	3	4	5	6	7	8	9	10
13 GUKORA AGASUKU GAKE MU RUGO NO KUBA WAMESA UKIYANIKIRA IMYENDA	0	1	2	3	4	5	6	7	8	9	10
14 GUKORESHA INGAZI ZIRI IWAWE	0	1	2	3	4	5	6	7	8	9	10

IGICE CYA 3

AMAGAMBO AKURIKIRA ARAKUBAZA UKO WUMVAGA UMEZE MU KWEZI GUSHIZE

1. UBABAYE CYANE KU BURYO NTA CYAGUSHIMISHA

A] ibihe byose, b] hafi buri gihe cyose, c] rimwe na rimwe, d] gacye, e] nta na rimwe

2. UFITE UMUSHIHA

A] ibihe byose, b] hafi buri gihe cyose, c] rimwe na rimwe, d] gacye, e] nta na rimwe

3. KUBURA IBITOTSI UKUMVA UFITE UBWOBA

A] ibihe byose, b] hafi buri gihe cyose, c] rimwe na rimwe, d] gacye, e] nta na rimwe

4. KUMVA WIHEBYE
A] ibihe byose, b] hafi buri gihe cyose, c] rimwe na rimwe, d] gacye, e] nta na rimwe

5. KUMVA NTA GACIRO UFITE
A] ibihe byose, b] hafi buri gihe cyose, c] rimwe na rimwe, d] gacye, e] nta na rimwe

6. UKUMVA IBINTU BYOSE BIKUGORA
A] ibihe byose, b] hafi buri gihe cyose, c] rimwe na rimwe, d] gacye, e] nta na rimwe

IGICE CYA 4

Mu byumweru bine bishize, waba. ...							
1. Warasuye inshuti cyangwa se umuryango (Atari abo mubana) ? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
2. Ujya uba umukorana bushake? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
3. Ujya gusenga cyangwa se witabira ibikorwa byo gusenga? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
4. Witabira ibiterane, amashyirahamwe cyangwa se Amanama rusange? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
5. Warakoresheje mudasobwa? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
6. warabyinnye (ibyino gakondo cyangwa se za kizungu) (ntushyiremo imbyino z'ingorangingo)? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
7. Warakoze imirimo nko ; gutashya, gufuma, gushushanya cyangwa se y'ubukorikori? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
8. waritabiriye ibitaramo cyangwa se kujya kureba imikino? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
9. warakinnye hamwe n'abandi amakarita, igisoro	Ni amasaha angahe	Munsi	Amasaha	Amasaha	Amasaha	Amasaha	Amasaha 9-

cyangwa se iyindi mikino? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	yose hamwe mu cyumweru ubikora?	y'isaha 1	1-21/2	3-41/2	5-6 1/2	7-81/2	cyangwa se arenze
10. warakoresheje icyuma cy'umuzika? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
11. warasomye ibitabo? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
12. warakoze imirimo ivunanye mu rugo (nko koza ibirahure by'inzu, gukoropa urubaraza ...)? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
13. warakoze imirimo yoroheje yo mu rugo nko gukubura? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
14. ukora imirimo ivunanye y'ubuhinzi? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
15. ukora imirimo yoroheje y'ubuhinzi nko kubagara? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
16. warakoze siporo yo kwiruka? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
17. warakoze akazi ko kuzamura cyangwa se guterura ibintu? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
18. Warakoze urugendo ruvunanye mu rwego rw'imyitozo? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
19. warakoze urugendo rwo kujya guhaha mu isoko cyangwa se kujyana abana ku ishuri?	Ni amasaha angahe yose hamwe mu	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se

☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	cyumweru ubikora?						arenze
20. waragenze gahoro witemberera? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
21. waragendeye ku igare? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
22. Warakoze imyitonzo ngororangingo ? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
23. warakoze imyitozo yo guterura ibiro biremereye? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
24. Warakoze imyitozo ukoresheje ibintu bitaremereye? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze
25. niba hari ikindi waba warakoze kitavuzwa haruguru? ☐YEGO Inshuro zingahe mu cyumweru?_____ ☐OYA	Ni amasaha angahe yose hamwe mu cyumweru ubikora?	Munsi y'isaha 1	Amasaha 1-21/2	Amasaha 3-41/2	Amasaha 5-6 1/2	Amasaha 7-81/2	Amasaha 9-cyangwa se arenze

MURAKOZE

Private Bag X17, Belville, 7535
South Africa
Tel: +27 (0) 21 959 2163
Fax: +27 (0) 21 959 2755
E-mail: esjohnson@uwc.ac.za

FACULTY OF COMMUNITY AND HEALTH SCIENCES

HIGHER DEGREES COMMITTEE

28th November 2007

Appendix B

TO WHOM IT MAY CONCERN

Dear Sir/Madam

Research Project of Mr. Maurice Kanyoni (Student Number: 2742375)

This letter confirms that Mr. Kanyoni is a registered student in the Faculty of Community and Health Sciences at the University of the Western Cape. His research proposal entitled ***"Factors associated with physical activity levels among older adults in institutions for the elderly in Southern Rwanda"*** submitted in fulfilment of the requirements for Masters in Physiotherapy has been examined by the Higher Degrees Committee and found to be of high scientific value, methodologically sound and ethical.

We fully support the research and kindly request that you allow him access to your organization.

Sincerely

DR GAVIN REAGON
Chairperson: Higher Degrees Committee

Private B. X17, Bellville 7535
South Af ca
Telegraph UNIBELL
Telephon +27 21 959 2542/6
Fax: +27 1 959-1217
E-mail: jfo ntz@uwc.ac.za
Website: w.uwc.ac.za

Appendix C

1/12/2007.

The Minister of Health
Republic of Rwanda
P.O Box 84 Kigali
Rwanda

RE: Request to conduct a research study in your home for the elderl

I am a Masters student in Physiotherapy at the University of the Western Cape, Cape Town in the Republic of South Africa. This research project will be done as a partial fulfillment of the requirements for the Masters of Science (M.Sc.) in Physiotherapy.

The title of my research is: **Factors associated with physical activity le els among older adults in institutions for the elderly in Southern Rwanda.**
I therefore humbly request for your permission to carry out this research study in the homes for the elderly. The results of this study will be discussed with the management of the homes, the staff members and the elderly from the homes and it is believed that it will help promote Physical activity among the elderly in this home for the elderly.
Confidentiality and anonymity will be assured regarding the participants identity and information they provide. Codes will be used instead of names.

Yours faithfully

Mr. Kanyoni Maurice
Student researcher

Professor Julie Ph
Rese isor

REPUBULIKA Y'U RWANDA

Kigali, kuwa

N° 20/...../MIN/07

Appendix D

MINISITERI Y'UBUZIMA
B.P 84 KIGALI
Website : www.moh.gov.rw
IBIRO BYA MINISITIRI
FAX : (250) 576853
TEL : (250) 577253

Bwana KANYONI Maurice
University of the Western Cape
Private Bag X 17, Bellville 7535
SOUTH AFRICA

Impamvu: Uruhushya rwo gukora ubushashatsi

Bwana,

Mpereye ku ibaruwa yawe wanditse usaba uruhushya rwo gukora ubushakashatsi bujyanye na Physiotherapy mu Majyepfo y'u Rwanda, nkwandikiye nshaka kukumenyesha ko urwo ruhushya urwemerewe.

Nkwifurije akazi keza.

Minisitiri w'Ubuzima

Dr. Jean Damascène NTAWUKULIRYAYO

Bimenyeshejwe:

- Bwana Umunyamabanga wa Leta muri Minisiteri y'Ubuzima Ushinzwe Kurwanya SIDA n'Izindi Ndwara z'Ibyorezo
- Bwana Guverineri w'Intara y'Amajyepfo
- Madamu Umunyamabanga Uhoraho muri Minisiteri y'Ubuzima KIGALI

SAINT ALOYS HOME FOR THE
ELDERLY
P.O BOX
HUYE
SOUTHERN PROVINCE
RWANDA
05/12/2007

Appendix E

TO KANYONI MAURICE
C/O UNIVERSITY OF WESTERN CAPE
PRIVATE BAG X17 BELVILLE
CAPE TOWN
SOUTH AFRICA

RE: RESPONSE

Following your request to conduct a study entitled **Factors associated with physical activity levels among older adults in institutions for the elderly in Southern Rwanda**., after finding out that your study was endorsed by the Ethics committee of University of the Western Cape, the administration of Saint Aloys home for the elderly has granted you permission to conduct this study in our Home.

Hopefully the results of your study will form a foundation for physical activity for the elderly people especially those who live in the senior centers in Rwanda.

Looking forward to discuss with you the results of this study.

Yours faithfully

Principle

HOME DES VIEILLARDS
Tél: 532154
BUTARE
ST ALOYS DE TUMBA

GISAGARA le 17/12/07

Home des pers. agées
"UMUBYEYI UMUHIRE" ABIZERAMARIYA GISAGARA
B.P. 110 Butare

Appendix F

Home des pers. agées ni Gisagara

Twiteguye kwakira Maurice wige Nsengimana Kanyoni Maurice akore ubushakashatsi kugira ngo yige ubujenocide n'abantu bakuru batuye muri iyi Home

Home St Raphaël GISAGARA

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959, Fax: 27 21-959
E-mail:

INFORMATION SHEET

Project Title: Factors associated with physical activity levels among older adults in selected institutions in Southern Province of Rwanda.

This is a research project being conducted by Maurice Kanyoni at the University of the Western Cape. We are inviting you to participate in this research project because you fulfil the requirements of participation in this study. The purpose of this research project is to determine the levels of physical activity and the factors associated with it among older adults in the Southern Province of Rwanda.

You will be asked to answer a number of questions; you will be interviewed by the research coordinator or the research assistant. The interview will be conducted in the meeting room of the institution where you live and it will take approximately 45 minutes to answer the questions. The interview will include questions like; do you go to the senior centre? If yes how many times a week?. There are predetermined optional responces to these questions: a. Less than 1 hour B.1-2½ hours c. 3-4½hours d. 5-6½ hours e. 7- 81/2 hours f. 9 or more hours.

During the past month, about how often did you feel so sad that nothing could cheer you up? There are predetermined options responces to these questions: a; All of the time b; Most of the time c; Some of the time d; A little of the time e; None of the time.

We will do our best to keep your personal information confidential. To help protect your confidentiality, we shall use codes instead of names and the information will be used for

academic purposes. If we write a report or article about this research project, your identity will be protected to the maximum extent possible.

There are no personal benefits to you but the results of the study will help the whole community of older adults and their caretakers in Rwanda in knowing the levels of physical activity and possible improvements where possible would be made.

This research is not designed to help you personally, but the results may help the investigator learn more about physical activity levels among older adults who live in institutions. We hope that, in the future, other people might benefit from this study through improved understanding of levels of physical activity among older adults who live in institutions and possible improvements where possible would be made. This study will contribute to research in the domain of physical activity among older adults in Rwanda where limited or no data is available.

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.

This research is being conducted by Maurice Kanyoni at the University of the Western Cape. If you have any questions about the research study itself, please contact Maurice Kanyoni at: +27730475258, email address kkmmv2004@yahoo.com.

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:
Dean of the Faculty of Community and Health Sciences:
University of the Western Cape
Private Bag X17
Bellville 7535

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959, Fax: 27 21-959
E-mail:

Appendix G1

IBISOBANURIRWA UBAZWA

Ubushakashatsi: Impamvu zijyanye no gukora imyitozo ngororangingo mu Basheshe akanguhe baba mu bigo by'abasheshe akanguhe mu Ntara yamagyepfo y'uRwanda.

Ubu bushakashatsi bugamije iki?

Ubu bushakashatsi burimo gukorwa na Maurice Kanyoni, umunyeshuli wiga ubugororangingo muri kaminuza ya Western Cape, muri Afurika y'epfo. Murasabwa kugira uruhare muri ubu bushakashatsi kubera ko mwujuje ibisabwa nabwo. Intego y'ubu bushakashatsi n'ukumenya, **impamvu zijyanye no gukora imyitozo ngororangingo mu Basheshe akanguhe baba mu bigo mu Rwanda.**

Nsabwa gukora iki, igihe nemeye kubazwa?

Urasabwa gusubiza ibiri ku rutonde rw'ibibazo. Biragutwara igihe kiri munsi y'isaha imwe gusa.

Ese ibisubizo ndibutange bizagirirwa ibanga?

Tuzakora ibishoboka byose mu kukugirira ibanga. Kugirango tukumare impungenge, nturi busabwe kuvuga amazina yawe ku buryo nta wundi muntu uzakumenya.

Hagize inyandiko yandikwa kuri ubu bushakashatsi, uzagirirwa ibanga rikomeye kubyo wasubije byose.

Nta ngaruka se nagira ngize uruhare muri ubu bushakashatsi?

Nta ngaruka nimwe izwi wagirira muri ubu bushakashatsi.

Ni izihe nyungu se ziri muri ubu bushakashatsi?

Inyungu kuri wowe ni uko ubu bushakashatsi bugamije kureba **impamvu zijyanye no gukora imyitozo ngororangingo mu Basheshe akanguhe baba mu bigo aho bishoboka ingorane muhuranazo muri icyo gikorwa zikaba zashakirwa umuti ninzego zibishinzwe**.

Ese nemeye kugira uruhare muri ubu bushakashatsi nshobora kwivanamo igihe cyose mbishakiye ?

Kwemera kugira uruhare muri ubu bushakashatsi ni ubushake bwawe busesuye. Ushobora kwemera cyangwa kutemera kubazwa. Wemerewe kwivana muri ubu bushakashatsi igihe cyose ubishatse nta nkurikizi, ntuzabihanirwa cyangwa ngo utakaze inyungu iyo ariyo yose wakagombye kubona yava muri ubu bushakashatsi.

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

Ubu bushakashatsi burimo gukorwa na Maurice Kanyoni, umunyeshuli wiga ubugorangingo muri kaminuza ya Western Cape, muri Afurika y'epfo. Ufite ikibazo kijyanye n'ubu bushakashatsi ubwabwo, wakwiyambaza Maurice Kanyoni kuri :

email: ninyoka77@yahoo.com

Cell: (+250)08615107 / +27730475258

Hagize ikibazo cyose wagira cyangwa ushatse kumenyekanisha ibibazo wahuye nabyo birebana n'ubu bushakashatsi, wakwiyambaza:

Uhagarariye ishami ry' ubugororangingo: Prof Jose Frantz

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

University of the Western Cape

Private Bag X17

Bellville 7535

Ubu bushakashatsi bwemejwe na Sena ya kaminuza ya Western Cape ishinzwe ubushakashatsi, na Komite ishinzwe iyubahirizwa ry'ikiremwa muntu mu bushakashatsi.

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CONSENT FORM

Appendix H

Title of Research Project: Factors associated with physical activity levels among older adults in institutions for the elderly in Southern Rwanda.

The study has been described to me in a 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.....

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:

Study Coordinator's Name: Prof. Julie Phillips

University of the Western Cape

Private Bag X17, Belville 7535

Telephone: (021)959-2542

Cell: +27829921549

Fax: (021)959-1217

Email: jphillips@gmail.com

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Appendix H1

Kugira uruhare

Ubushakashatsi: **Impamvu zijyanye no gukora imyitozo ngororangingo mu Basheshe akanguhe baba mu bigo by'abasheshe akanguhe bo mu Ntara y'amagepfo, Rwanda.**

Nyuma yo gusobanurirwa iby'ubu bushakashatsi n'ibijyanye nabwo mu rurimi numva, kandi ko bazangirira ibanga kubyo nzavuga byose, no kuba nemerewe kwivana muri ubu bushakashatsi igihe cyose mbishatse ntankurikizi byangiraho, nemeye ku bushake bwanjye kugira uruhare muri ubu bushakashatsi.

Amazina y'ubazwa.....

Umukono w'ubazwa.....

Italiki.....

Hagize ikibazo wagira cyangwa ushaka kumenyekanisha ibibazo wahuye nabyo bijyanye n'ubu bushakashatsi, wakwiyambaza uhagarariye ubu bushakashatsi ku mwirondoro ukurikira:

Ukora ubushakashatsi: Maurice Kanyoni

University of the Western Cape

Private Bag X17, Belville 7535

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Email: ninyoka77@yahoo.com