

**HEALTH PROMOTION NEEDS OF PHYSICALLY DISABLED
INDIVIDUALS WITH LOWER LIMB AMPUTATION IN SELECTED
AREAS OF RWANDA**

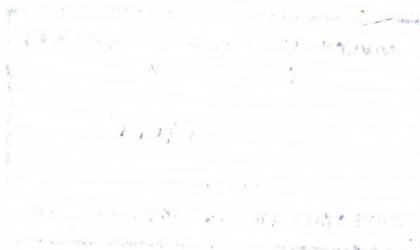
By

Eugene MUTIMURA



**A thesis submitted in partial fulfilment of the requirements for
the degree of Masters of Science in the Department of
Physiotherapy, University of the Western Cape.**

November 2001



Supervisor: Professor SL AMOSUN

Co-supervisor: Mrs. José FRANTZ

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THESIS

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ABSTRACT

This thesis is a quantitative and qualitative study, reflecting the health promotion needs of individuals with lower limb amputation in Rwanda. Individuals with physical disabilities are at risk of secondary complications due to the impact of the disability, and this may be exacerbated by poor choices of lifestyle. Rehabilitation services have been traditionally designed for those experiencing sudden on-set, traumatic disabling conditions. Although physically disabled persons desire to engage in wellness-enhancing activities, limited programs based on their health promotion needs' assessment have been developed. In this study, participants' health promotion needs and factors that influence their health-related behaviours were examined using a questionnaire survey and in-depth face-to-face interviews. Data analysis, using SPSS version 10.0, was used to obtain frequency tables and histograms. Chi-square tests, Fisher's exact Tests and Pearson's correlation coefficient were utilized to test for associations between several variables. Audiotape recordings and process notes were translated, and then transcribed verbatim. Strong themes that ran through the data were identified. In order to qualify for between-method triangulation used in the study, complementally strengths were identified by comparing textual qualitative data with numerical quantitative results and vice versa. Participants were 334, comprising more males (80%) than females (20%). The most frequently reported cause of amputation was land mines injuries (44.6%). Most participants were either unilateral below-knee (40.7%) or above-knee (40.1%) amputees. The majority of participants led physically inactivity lifestyles (64.7%), others consumed alcohol (60.5%), used tobacco (33.5%) and drugs (9.6%). In-depth

interviews revealed that participants' low psycho-social status and self-perception led to depression and frustration. Negative peer influence and lack of access to relevant information predisposed them to involvement in risky health behaviours. Further interviews indicated that the participants' perceived health-related needs included access to relevant information and new lifestyle habits to improve their health. Participants also desired job opportunities, particularly vocational training programmes and the formation of support groups, to enhance various programmes. The study findings are extremely challenging. Over 50% of participants were engaged in health-risk behaviours, which would certainly result in the deterioration of their health status. This places a greater demand on rehabilitation services, increasing morbidity and mortality rates, thus further straining the national health budget. There is therefore an urgent need to develop, encourage and promote wellness-enhancing behaviours and activities, to improve the participants' health status and ultimate quality of life. Finally, further studies need to focus on barriers and determinants of health-promoting behaviours, and to explore more about issues related to self-perception and risky health behaviours.

DECLARATION

I hereby declare that "*Health Promotion needs of Physically Disabled Individuals with Lower Limb Amputation in Selected Areas of Rwanda*", is my own work, that it has not been submitted, or part of it, 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 means of complete references.


Signature:


Eugene MUTIMURA

November 2001



Witnesses:


.....

Professor SL Amosun


.....

Mrs José FRANTZ

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ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
ASMSF	Australian Medical Support Force
CVD	Cardio-vascular diseases
EX-FAR	Forces Armées Rwandaises
HIV	Human Immuno-deficiency Virus
HR_{max}	Maximum Heart Rate
LLA	Lower Limb Amputation
SPSS	Statistical Package for Social Sciences
UN	United Nations
UNICEF	United Nations Children Emergency Fund
VO₂R	Maximum Oxygen uptake Reserve
WHO	World Health Organisation
X²-test	Chi-square test



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CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

This chapter begins with a description of the lifestyle patterns and behaviours of individuals with physical disabilities, mainly those with lower limb amputation (LLA). This description attempts to portray an image of the events that resulted in higher occurrence of individuals with lower limb amputation following the dreadful events of the 1994 civil war. In the background, the vulnerability of individuals with LLA to secondary disabilities is explained. This susceptibility can either be due to direct impact of the disability or poor choices of lifestyle. The rationale and significance of the study are explained. Finally, research questions, aims of the study, and hypothesis are stated. This chapter ends with the definition of terms used in the study, and a summary of the chapters.

The stimulus for carrying out this study was the investigator's observations and personal experience regarding the lifestyle patterns of individuals with physical disabilities, mainly those with lower limb amputation. Following the 1994 civil conflict, the lifestyle patterns of most individuals were affected, particularly those with some impairment. The commonest injury that had occurred and resulted in permanent disability appeared to be amputation, mainly affecting the lower limb.

From 1995 to 1998, the investigator worked in outreach clinics, based at Central Hospital of Kigali, in most districts of Kigali Rural Province. While working at Central Hospital of Kigali, the country's national referral hospital, it was evident that almost all individuals with physical disabilities, particularly those with lower limb amputation, did not go back to their districts of origin after rehabilitation and prosthetic fitting. The majority remained on the streets of Kigali, the capital city, either as street beggars or looking for job opportunities. The government authorities through the administration of Kigali Ville Province made an effort to settle some disabled in their homes. Since few vocational institutions existed and there were minimal job opportunities for the physically disabled, the majority of young people with lower limb amputation remained inactive either as beggars or mere malingers on the streets of Kigali.

The researcher further worked in a nation-wide training project for assistant physiotherapists. During this period, it was observed that the majority of the physically disabled individuals, living in other districts including those with lower limb amputation, also led inactive lifestyles with little or no job opportunities. In consequence, most of those young people who lost their limbs became severely depressed, and this resulted in unhealthy lifestyles. In addition to physical inactivity, the majority indulged in substance usage including tobacco use, alcohol consumption, and a few had taken to drug abuse.

1.2 BACKGROUND OF THE STUDY

The period between 1990 and 1995 in Rwanda was characterised by war, the climax of which was in 1994. Due to the inadequacy of treatment facilities and lack of timely treatment intervention, many people especially the youth and children, as well as the military and civilian population remained heavily physically and psychologically traumatized. Because of the consequences of war, Labeeu *et al.* (1996) indicated that there was often mass surgery of the heavily wounded. Due to precarious conditions and limited equipment, this frequently led to amputations. Although some authors have indicated that penetrating bayonet wounds and machetes affected a high number of people (Geltman and Stover, 1997; Omaar, 1994), land mine and grenade blasts, appear to have characterised most injuries (Farrow, 1998; Pearn, 1996a).

The problems of land mines left after wars and conflicts have reached crisis proportions in several countries. Studies have indicated the detrimental effects on individuals affected by land mines after armed conflicts (Anderson *et al.*, 1995; Pearn, 1996b). Most land mine blasts affecting the lower limbs often result in amputations. It is crystal-clear that the 1994 civil war in Rwanda resulted in a number of physical disabilities (Farrow, 1998; Pearn, 1996a; Geltman and Stover, 1997; Omaar, 1994). However, to the researcher's knowledge, the exact prevalence of physical disability has not been ascertained. Nevertheless, the annual statistical records at Central Hospital of Kigali for the period 1997 to 2000 indicated an exponential increase in the number of lower limb amputations. Moreover, more than 50% of the cases were

caused by land mines (Office of the Hospital Director, 2000). A good number of the surgical procedures performed during the Australian Medical Support Force (ASMSF) deployment to Rwanda were limb amputations (Farrow *et al.*, 1997). However, information that is more substantial could have included the type and level of limb amputations performed. In any case, the ASMSF percentage estimate of 7.3% to 8.2% limb amputations (Farrow *et al.*, 1997), is very high, since land mines continuously affect a number of people even several years after armed conflicts.

1.2.1 Possible effects of a primary disability

Physically disabled persons often suffer from secondary complications that may arise after a primary disability. Secondary complications do not only include medical complications such as contractures, spasticity, pressure sores or occurrence of phantom limb pain. Frey *et al.* (2001) argues that secondary complications also include psycho-social adjustment to depression, isolation and environmental issues like difficulty with architectural accessibility. Coyle *et al.* (2000) also indicate that the occurrence and severity of secondary conditions can further limit a person's ability to perform essential life tasks and social roles.

It is certainly important that health services are oriented towards the prevention of secondary complications. However, it is most essential that rehabilitation should aim to enhance the health status of individuals already affected by physical disabilities. It is on this premise that some authors emphasize that although the prevention of secondary complications is important, of more importance is to make living with them

as healthy as possible, as many physical disabilities are life-long (Coyle *et al.*, 2000; Krahn *et al.*, 2000; Rimmer, 1999; Smith, 2000; Stuifbergen *et al.*, 2000).

Clearly, people with physical disabilities are more vulnerable to secondary disabilities following primary disabilities. For example, individuals with lower limb amputation are more likely to initially deal with overcoming contractures and phantom limb pain (Pandian *et al.*, 1999). In order to meet their daily functional needs, they have to overcome increased energy demands from cardiovascular and pulmonary systems for ambulation (Pitetti, 2000). Furthermore, they need to adjust to the general consequences including decreased social relationships, depression and prosthetic gait (Stover *et al.*, 1994).

1.2.2 Choice of lifestyle and its possible consequences

The choice of lifestyle of an individual affected by a disability often has an impact on his quality of life. A habitual lifestyle that involves health-promoting behaviours certainly enhances an individual's health status. On the other hand, practising health-risk behaviours is a potential danger, which often results in poor health conditions. Efforts in health promotion place an emphasis on self-responsibility (Breslow, 1999; Davis, 2000). Such efforts reflect the need for health professionals to educate individuals with physical disabilities about health-promoting behaviours. Increasingly, persons with various physical disabilities are expected to be informed, and act as partners with the health care professionals in living an appropriate lifestyle (Nielsen *et al.*, 1989). In order to enhance the quality of life of the physically disabled, health care

providers and policy makers are compelled to respond to the physically disabled health promotion needs.

Individuals who have undergone amputation of the lower limb are at a greater risk than the general population for many health problems. A considerable body of literature exists to substantiate the vulnerability of individuals with LLA, mainly due to poor choices of lifestyles. Mortality rates from cardiovascular diseases have been reported to be higher among traumatic lower limb amputees than matched controls (Modan *et al.*, 1998). Although vascular lower limb amputees are more likely to suffer from cardiovascular diseases (Christman *et al.*, 2001), higher rates of ischaemic heart disease and diabetes mellitus were found among trauma casualties with lower limb amputations compared with age-matched controls (Yekutieli *et al.*, 1989).

1.3 RATIONALE FOR THE STUDY

Although no reliable literature on the prevalence of disability in Rwanda could be traced as far as the researcher is concerned, the consequences of war such as the indiscriminate use of land mines have resulted in increased number of people with lower extremity amputation. While there are other health-related behaviours, this study focussed mainly on two behaviours, namely physical activity participation and substances usage. Physical inactivity and substance usage appear to be major unhealthy lifestyle practices by the people with physical disabilities in Rwanda. In addition, these two risky health behaviours are the main contributing factors to

morbidity and mortality rates (Christman *et al.*, 2001; Melzer *et al.*, 2001; Rose *et al.*, 1987; Swart, 1998).

In general, Smith (2000) recently noted that advances in medical technology have permitted an increasing number of people to survive serious accidents and diseases, but to sustain permanent disabilities. Individuals with limb amputations have been enabled to survive and live longer with potentially fulfilling lives (Nielsen *et al.*, 1989). Therefore, improved medical care has led to the enhancement of quality of life resulting in people with disabilities living longer. It is a fact that severely disabled individuals now live longer than ever before. A greater number of young people with physical disabilities can now reach adulthood (Blomquist *et al.*, 1998). According to Winker and Glass (1996) the life expectancy of persons with physical disabilities is beginning to approximate that of the general population. Burns *et al.* (1990) also indicate that persons who become disabled early in life now live long enough to experience many of the same chronic health problems faced by the rest of the population. Since individuals with LLA are likely to suffer from secondary conditions, or even diseases due to poor lifestyles, like physical inactivity or substance usage (Modan *et al.*, 1998), this raises serious concerns.

Therefore, amputation of the lower limb may have serious implications for individuals' well-being and survival. Although Stuijbergen *et al.* (2000) indicated that current attention is directed at prevention and medical care, as well as rehabilitation and health promotion for disabled persons, this still has to be realized in some countries

including Rwanda. In spite of the susceptibility of the disabled persons to secondary conditions, management has in most cases been targeted at the treatment and rehabilitation of the disability. Rimmer (1999) contends that there have been few programs and little research to address issues of health promotion needs. Rimmer (1999) further argues "this has kept people with disabilities out of the limelight and in the background of research agendas". In addition, services have also been traditionally designed for individuals experiencing sudden onset, traumatic disabling conditions such as immediate cases of amputations, spinal cord injuries, strokes and head injuries (Stuifbergen and Roberts, 1997).

Thus, despite the increasing interest by individuals with disabilities and health care professionals in this area, little is known about the health promotion needs and behaviours of people with various disabling conditions (Iezzoni et al., 2000; Stuifbergen and Roberts, 1997). Genuinely, it appears that appropriate practices related to these behaviours have been left to the physically disabled themselves. Rehabilitation professionals have not sufficiently assumed the roles of partnership to educate, research and provide relevant information to the physically disabled.

Therefore, this study attempts to address an imbalance, in which people with physical disabilities, mainly those with lower limb amputations often face the challenges of promoting their well-being and maintaining a good quality of life with little help from health care professionals. From this point of view, there has been an eminent need for

a study on the health promotion needs of individuals with lower limb amputation in Rwanda, a country that has emerged from the aftermath of war.

1.4 SIGNIFICANCE OF THE STUDY

The findings of this study will contribute to the knowledge of health-related behaviours of physically disabled individuals with lower limb amputation in Rwanda. From this study, intervention programs addressing the health promotion needs of lower limb amputees will prevent the incidence and severity of secondary complications. Interventions based on these study findings will contribute to improving the quality of life of individuals with lower limb amputations.

This study attempts to identify factors that influence the health-related behaviours of people with lower limb amputation. Most secondary complications are exacerbated by a poor choice of lifestyle (Coyle *et al.*, 2000). Therefore, efforts in health promotion intervention should place an emphasis on participation in health-promoting behaviours such as participation in physical activity, while refraining from health-risk behaviours, like tobacco smoking and drug abuse.

Currently, the health care personnel labour force, mainly the rehabilitation sector, is overstretched because of a small number of health care personnel and the possible increase in physical disabilities due to the recent civil war. The views of the participants in the study on issues to promote their wellness-enhancing behaviours should help to prevent additional secondary disabilities. This will certainly improve the

quality of rehabilitation by decreasing morbidity rates, which will result in lower health care costs.

Finally, participation in physical activity has been related to a greater likelihood of employment due to less absenteeism, resulting in enhanced productivity (Shephard, 1991). Consequently, participation in such behaviours would not only improve the disabled individuals' well-being, but also boost national economies because of increased time and a more energetic workforce.

1.5 STATEMENT OF THE PROBLEM

Issues surrounding the health promotion needs of individuals with LLA in Rwanda have not been sufficiently explored. It was therefore worthwhile to determine the health promotion needs of individuals with LLA following the 1994 civil war.

1.6 RESEARCH QUESTIONS

The specific research questions addressed in this study include:

1. What are the health-related behaviours of physically disabled individuals with lower limb amputation in Rwanda?
2. What factors influence health-related behaviours of physically disabled individuals with lower limb amputation?

1.7 THE CORE PURPOSE OF THE STUDY

The purpose of the study was to determine health promotion needs and factors that influence the health-related behaviours of physically disabled individuals with lower limb amputation.

1.8 OBJECTIVES

- (i) To identify the health-related behaviours of physically disabled individuals with lower limb amputation.
- (ii) To identify factors that influence the health-related behaviours of physically disabled individuals with lower limb amputation.
- (iii) To identify major issues that need to be targeted in health promotion programmes for physically disabled individuals with lower limb amputation.

1.9 RESEARCH HYPOTHESIS

It is hypothesized that physically disabled individuals with lower limb amputation in Rwanda have various health promotion needs, which increase with age and are greater in males than in females.

1.10 DEFINITION OF TERMS USED IN THE THESIS

1. Health-promoting behaviours include physical activity or exercise, eating practices, seeking of social support, and stress management (Stuifbergen and Rogers, 1997).
2. Health Promotion in a public health context is intended to maintain and enhance existing levels of health through the implementation of effective programs, services and policies (Chermak, 1990; Smith, 2000). The concept of health promotion emphasizes self-care and encourages an active independent attitude towards health care rather than expert care (Stuifbergen and Rogers, 1997).
3. Health promotion needs are needs from the perspective of the clients. They are aimed at increasing and maintaining client participation in activities designed to enhance his quality of life and control of his life status. They include physical activity, good nutritional practices, stress management techniques and social support. However, since the perceptions of an individual may be limited, all risk lifestyle behaviours like substance usage, which can result in a deterioration of quality of life are regarded as health promotion needs (Naidoo and Wills, 2000; Stuifbergen *et al.*, 2000; Hogan *et al.*, 2000).
4. Quality of life: The definitions and descriptions of quality of life include both objective and subjective indicators of physical and psychological phenomena (Stuifbergen and Rogers, 1997). Objective indicators include income, living situations and physical functioning. On the other hand, subjective evaluations of quality of life represent the individual's perception of important life domains and

- satisfaction with those domains. Quality of life reflects an individual's sense of well-being and satisfaction with life (Stuifbergen, 1995).
5. Disability is any restriction in performing an activity within the range considered normal for a human being. It may be temporary or permanent, progressive or regressive (Schuntermann, 1996; WHO, 1995).
 6. Amputation is defined as the loss of any part of a limb (Rith-Najarian *et al.*, 1998). On the other hand, Matsen *et al.*, (2000) defined lower extremity amputation as the removal of parts of the limb that are necessary for walking and basic social function.
 7. Health needs include normative needs defined by experts or professionals as well as the clients. They may also be comparative needs identified when people or group areas fall short of particular established standards (Naidoo and Wills, 2000).
 8. Health is promoted by providing a decent standard of living such as good labour conditions, education, means of rest and recreation. Therefore, health is not simply the absence of disease: it is something positive, a joyful attitude towards life, a cheerful acceptance of the responsibilities that life puts upon the individual (Breslow *et al.*, 1999).
 9. Physical activity is defined as "bodily movement produced by skeletal muscles that requires energy expenditure" and may bring about physical fitness and health related benefits (Cooper *et al.*, 1999).

10. Exercise, a type of physical activity, is defined as “a planned, structured, and repetitive bodily movement done to improve or maintain one or more components of physical fitness “ (Cooper *et al.*, 1999).

1.11 SUMMARY OF CHAPTERS

Chapter one describes the basis of the current study. This includes the circumstances of the 1994 civil war, such as the consequences of land mines. The writer describes the impact of disability with a particular focus on lower limb amputation. He further shows how poor lifestyle behaviours may exacerbate the existing disability, and thus lead to further deterioration of an individual's life status. The underlying principle of the study highlights the need for health promotion intervention based on the clients' health promotion needs.

In chapter two, the literature reviewed highlight essential issues that need to be focused on. These include, among others the prevalence of various types of disabilities in Rwanda, the impact of the civil war and the effect of land mines, and the need to engage in health-promoting behaviours. In this chapter, the conceptual model of health promotion reviewed reveals the influence of contextual factors on health behaviours, and the subsequent outcome of quality of life. Finally, the use of between-method triangulation adopted in the study methodology is reviewed.

In chapter three, the study milieu, study population and sampling are described. Furthermore, an attempt is made to explain essential methodological issues, including methods of data collection and study procedure. Instead of the commonly used postal services to contact prospective participants for a study, the study utilized the more efficient and radically quicker method of radio announcements. This method was supplemented by the use of posters at various research settings. A self-administered questionnaire survey and in-depth face-to-face interviews were employed in data collection. Descriptive and inferential statistics were utilized in quantitative data analysis. A series of qualitative data analysis consisted of translations of interview quotations and field process notes. Then, precise transcriptions of audiotape recordings and the discovery of strong themes that ran through the data followed. Finally, qualitative textual data was compared to numerical quantitative findings to qualify the process of between-method triangulation utilized in the study.

In chapter four, the profiles of the participants in the study in relation to the Provinces reveals that the majority came from the urban areas. The number of male participants was approximately five times that of females. The most common cause of lower limb amputation was reportedly land mines. Although the number of participants who had ambulatory devices was high, most participants considered their ambulatory devices to be in a poor condition. The findings of the study indicated that most participants led risky lifestyle behaviours such as physical inactivity and substance usage. A number of demographic factors, resources, barriers and self-perception influenced participants'

health-related behaviours. The majority of participants perceived most health-promoting programs and activities as essentially health-enhancing.

In chapter five, the discussion centres on an attempt to interpret the current study findings, a comparison of the study with similar studies and both the immediate and long-term impact of the findings. An effort is made to discuss how the existing trends of participants' poor lifestyle behaviours could be reversed.

The final chapter, entitled "Summary, Conclusions and Recommendations", summarizes, draws pertinent inferences from the research and proposes suggestions for future action.



CHAPTER TWO

REVIEW OF LITERATURE

2.1 INTRODUCTION

This chapter critiques some studies that attempted to review the prevalence of physical disability in Rwanda. In addition to the incidence of lower limb amputation, the combined impact of land mines and civil war have also been described. A number of health-promoting behaviours and the concept of health promotion are reviewed, which highlight self-care and encourage an active, self-sufficient approach towards health. Due to the inadequacy of literature on Rwanda, some of the literature reviewed focusses on international studies. The chapter ends with the significance of the use of between-method triangulation that was utilized in the data collection.

2.2 PREVALENCE OF PHYSICAL DISABILITY IN RWANDA

There is a serious lack of reliable information on Rwanda with regard to the nature and prevalence of physical disabilities in general. Although some studies have been done in an attempt to ascertain the nature and prevalence of disability, the various methodologies used lacked appropriate validity and reliability to justify these research findings.

In 1992, an association called '*Les amis de l'abbé FRAIPONT*' published a document requesting the government to carry out a study on the prevalence of disability. The publication noted that the only study that had been started was not carried out effectively, and was only based on one type of disability, namely the number of amputations as a result of the 1990 war (Les amis de l'abbé FRAIPONT', 1992). In March 1995, a study co-ordinated by Jordan and Ufiteyezu (1995) reported a disability prevalence of 0.6%. This was a joint study by a non-governmental organisation called '*Action Nord Sud/ Handicap International*' together with the Ministry of Rehabilitation and Social Integration (MINIREISO), and the Ministry of Labour and Social Affairs (MINITRASO). The non-governmental organisation- *Action Nord Sud/ Handicap International*- works partly in the rehabilitation sector of the physically disabled, particularly those with lower limb amputations. The final report revealed that the prevalence of disability was more than 0.6% since three provinces were not included in the study due to being in a war zone sanctuary, then referred to as '*zone turquoise*'. In a study by community rehabilitation workers based in Kigali Ville Province, an estimate of 1.8% prevalence of disability was also reported (CBM-Inkurunziza, 1998).

While one would acknowledge the attempt of these studies to address the issue of the prevalence of disability in the country, it appears that the findings of these studies are not reliable as current sources. Since there was an exodus of returnees from neighbouring countries in late 1995 (Holmes and Jones, 1995), a study on the prevalence of disability carried out by Jordan and Ufiteyezu (1995) earlier in March the

same year is unreliable. Holmes and Jones (1995) estimated that 1.2 million Rwandan people were outside the country between July 1994 and July 1995.

Moreover, these studies were not carried out in all parts of the country, but only in certain provinces where it was possible due to security reasons immediately after the war period. For example, the study by community rehabilitation workers was carried out in Kigali Ville Province (CBM-Inkurunziza, 1998), which is the most densely populated, and appears to have been the most adversely affected by the war. Furthermore, the general population profile in terms of size and geographical distribution has been profoundly distorted by the 1994 war. The prevalence estimates of disability based on Kigali Ville Province cannot be extrapolated to the general country since the population of Kigali Ville Province approximately doubled from 1994 to 1999 (Office of the Minister of Finance and Economic Planning, 2000).

The two studies did not define the parameters of the severity and the type of disability under the study. One would therefore wonder whether the conditions considered were mild to severe, or only cases of severe disabilities. For instance, whereas a person with unilateral toe and foot amputation is an amputee, his or her degree of disability is far less than that of a bilateral femoral or above-knee amputee. The various methodologies used to ascertain the prevalence of disability by these studies are indecisive.

In many studies, financial constraint was the main limitation to travel countrywide to carry out suitable studies (CBM-Inkurunziza, 1998; Jordan and Ufiteyezu, 1995). To overcome this, a cluster sampling method is recommendable, and would have two advantages. It would be easy to overcome the problem of a good sampling frame for a dispersed population of unknown number of disabled persons, and save on the costs of travelling to all the provinces (Neuman, 2000).

2.3 THE OCCURRENCE, CAUSES AND TYPES OF LOWER LIMB AMPUTATION

The current incidence of lower limb amputation in Rwanda may well be related to the events and the consequences of 1994 civil war. Some studies have noted that direct confrontations and indiscriminate killings, in addition to inadequate facilities during the war highly contributed to the occurrence of lower limb amputation in the country (Farrow *et al.*, 1997; Geltman and Stover, 1997). To the investigator's knowledge, no study on the exact statistical account of the incidence of any amputation in Rwanda could be traced. However, based on the researcher's clinical experience, land mines and gunshot wounds resulted in the highest percentage of lower limb amputation. This premise is further indicated by a number of authors, who attribute most causes of lower limb amputation to widespread use of land mines and gunshot injuries in war-devastated countries (Anderson *et al.*, 1995; Pearn, 1996a; Pearn, 1996b).

The occurrence and causes of lower extremity amputation varies considerably. A number of studies indicate that the most common cause of lower extremity amputation

is peripheral vascular disease, followed by diabetes mellitus (Condie *et al.*, 1996; Cutson and Bongiorno, 1996; Durance, 1989; Frykberg *et al.*, 1998; Pernot *et al.*, 1997; Pohjolainen *et al.*, 1989). However, most of these studies have been based in Western countries where chronic diseases of lifestyle are most predominant, and where there are less internal wars and conflicts. In most countries affected by war, land mines appear to be the commonest cause of lower limb amputation (Stover *et al.*, 1994; Pearn, 1996a; Pearn, 1996b; WHO, 2000a). In a study based in four strongly-affected countries, Anderson *et al.* (1995) noted that, "the problems of land mines left after armed conflicts are now recognised as reaching crisis proportions in many countries". In their study, Anderson *et al.* (1995) further argues that lack of resources hinders adequate programmes to tackle the problems of land mines. Land mines affect countries after armed conflicts, which appear to be mainly the developing countries, whose economies are coincidentally overstretched. It may therefore be argued further that insufficient financial resources and inadequate knowledge of how best to focus the efforts may be an obstacle to this problem for the affected countries.

More recently, Dougherty (2001) noted that since World War II, explosive munitions including land mines, grenades, and other different types of ordnance have been the most common cause of amputation. According to the World Health Organisation (WHO) (2001a), traumatic amputation of lower extremities affects 35% of the victims who survive in most war-torn countries. Most data on incidents of land mine injuries come from rehabilitation or medical facilities (Coupland and Russbach, 1994). However, most victims do not have contact with the services (Anderson *et al.*, 1995).

Therefore, such figures may be uncertain, and appear to underestimate the problem since the worst impact is often on remote rural communities in poor countries; and many victims may die alone far from help.

Amputations are broadly divided into two major categories: upper and lower extremity amputations (Pitetti, 2000). Although 80% of lower extremity amputations are reportedly caused by peripheral arterial disease and diabetes in Western countries including the United States of America (Pitetti, 2000), the most common cause in countries affected by war is land mines (Anderson *et al.*, 1995; Stover *et al.*, 1994; WHO, 2000b). In Rwanda trauma due to vehicle accidents, or direct confrontations during war were reported as some of the major causes of amputation (Farrow *et al.*, 1997; Pearn, 1996a). In addition, severe injuries from tools and machinery account for a number of lower limb amputations (Pitetti, 2000). Lower limb amputations are classified into a number of categories. These include (1) toe and partial foot amputation, (2) unilateral below-knee, (3) unilateral above-knee, (4) hip dislocation and hemipelvectomy, (5) bilateral below-knee, (6) bilateral above-and-below knee and (7) bilateral above-knee (Pitetti, 2000).

2.4 THE COMBINED IMPACT OF LAND MINES AND CIVIL WAR

The impact of land mine blasts is enormous, and affects the injured physically and psychologically. The immediate pain of the blast of the land mine cannot be described (WHO, 2000a; WHO, 2000b). An individual often feels depressed, recalls the accident

in nightmares for months or years after, and cannot easily express his/her trauma in words (Webversion/Webmaster compilation, 2000).

Land mines are usually planted during conflicts to purposely trap the enemies. However, studies strongly indicate that land mine disasters affect even the civilian population many months and years after the cessation of conflicts (Geltman and Stover, 1997; Pearn, 1996a; Pearn, 1996b; Stover *et al.*, 1994). The circumstances of injury from land mines are extreme. Land mines inflict severe damage on the victims by forcing dirt in the form of clothing, metal or plastic fragments into the tissues (WHO, 2000b). Although any part of the body is susceptible to injury following a land mine blast, Stover *et al.* (1994) indicated that the most frequent injury among survivors of land mine accidents is the loss of a leg.

However, land mine injuries are not at any moment restricted to one part of the body. Emergency workers for the International Committee of the Red Cross (ICRC) pointed out that land mines also damage other parts of the body including the genitals, face, eyes and ears (Pandian *et al.*, 1999; Stover *et al.*, 1994; WHO, 2000b). In addition, Pearn (1996b) noted that land mine victims are likely to need more blood transfusions and surgical operations than victims of other injuries such as motor vehicle accidents. Therefore, such demands ultimately result in longer medical care and costs, which have additional consequences for the victim.

Survivors of land mines usually require extensive and prolonged medical care and rehabilitation. Some reviews of the social costs have indicated that victims often spend less than two months or so in the hospital (Anderson *et al.*, 1995; Pandian *et al.*, 1999; Stover *et al.*, 1994). Although women and children are also affected (WHO, 2000b) men of more economically productive age seem to be most affected by war, and consequently by land mines and gunshot injuries (Anderson *et al.*, 1995). Therefore, in addition to other consequences of war, the impact of land mines influence full re-integration of the victims and their families into society. Various studies clearly indicate that land mines disrupt and undermine economic productivity, and affect community functioning (Dougherty, 2001; Pandian *et al.*, 1999; Stover *et al.*, 1994; WHO, 2000b).

The circumstances of war affect the general population, but impact more negatively on the lives of the most disadvantaged persons in the community, such as the disabled. Studies have noted that although disability may be caused by war and violence, the events of war such as land mines further exacerbate the existing health and socio-economical problems (Office of the Deputy President, 1997; WHO, 2000b). World Health Organisation further noted that land mines render large tracts of land unusable and prevent most villages from accessing essential commodities (WHO, 2000b). Therefore, such an effect interferes with 'health services' essential for the promotion of health, as redefined by the Alma Ata Declaration of 1978 to include agriculture, the supply of essential commodities, and education for children (Coulson *et al.*, 1998). Since the disruption of economies is usually eminent and access to basic commodities

becomes difficult, the lasting effect is often malnutrition, which makes the prevention of infectious diseases more unattainable (WHO, 2000b).

The effects of the civil war in Rwanda were far-reaching mainly because of the already existing political bankruptcy, and the overstrained socio-economical status that have characterized most developing countries. On an individual level, several people who survived death from both gunshots and machete assaults up to the present bear a miscellany of healed wounds (Omaar, 1994; Pearn, 1996a). Many have remained with complications of retained bullets and fragments from all types of weaponry that maimed a high number of the Rwandan population (Mugabo, 2001; Geltman and Stover, 1997). On a broader perspective, the existing circumstances such as poverty, lack of information and a high illiteracy rate, unhealthy lifestyles and social environment have definitely exacerbated the level of disability (Gail and Nora, 1999; Microsoft Encarta, 2001; Office of the Minister of Finance and Economic Planning, 2000; Ostir *et al.*, 1999).

Physical disabilities have serious consequences on the individuals affected, their families and society in general. In societies where cultivation is labour-intensive requiring the participation of every family member, a physically disabled individual with lower limb amputation may be considered a burden- someone who eats but produces little or nothing (Stover *et al.*, 1994). Physical consequences affect everyday functioning and restrict physical activity and the ability to maintain self-sufficiency, and ultimately the freedom to live a chosen lifestyle (Office of the Deputy President, 1997;

Ostir *et al.*, 1999). Misconceptions about the capabilities of amputees also exist, and often in some countries no laws protect them against discrimination and exploitation (Pandian *et al.*, 1999).

Unfortunately, efforts made by the individual affected countries to track down the scourge of land mines have not met with much success (Pandian *et al.*, 1999). The World Health Organisation, in response to the public outcry, declared land mine injuries as a public health problem, and in its plan of action, adopted a number of strategic interventions (WHO, 1999). The main political momentum around the problem of land mines was the support of an intensive public health strategy regarding the victims. Specific programmes that appear to have been on agenda included injury assessment and prevention, strengthening the capacity of the affected countries, promotion of land mine awareness, integrated emergency management and strengthening rehabilitation services (WHO, 2000a; WHO, 2000b; WHO, 1999). However, since such services are considerably urgent, one would wonder how much has been achieved since the July 1994 United Nations' (UN) Conference in Geneva, when these strategies were adopted. Although a total ban on manufacture and use of land mines was also called for during the UN Geneva Conference (Anderson *et al.*, 1995), the whole world needs to realize the tangible effects of such strategies to reduce the risks of existing land mines.

2.5 IMPACT OF LOWER LIMB AMPUTATION

Clearly, amputation of a lower limb has a broad impact on a person's life. It affects not only ambulation and activities of daily living, but also body image, psychosocial adjustment and interpersonal relationships (Bodenheimer *et al.*, 2000). Certain influences on amputations affect their life status. A clinical depression rate of 35% in an outpatient sample of lower extremity amputation has been reported (Rybarczyk *et al.*, 1992). Other adjustment problems among individuals with lower limb amputation include anxiety, low self-esteem, loss of a sense of wholeness, social isolation, and decreased sexual activity (Bodenheimer *et al.*, 2000; Rybarczyk *et al.*, 1992; Stover *et al.*, 1994; Varni *et al.*, 1991).

Principal psychological factors reported by persons with lower limb amputation include diminished self-image, fear of rejection by partners, poor coping skills and role changes (Bodenheimer *et al.*, 2000). In addition, problems in all domains of sexual functioning following lower extremity amputation have been reported (Williamson and Walters, 1996).

Individuals with lower limb amputation who are unemployed attribute it to lack of adequate adjustments at their place of work (Schoppen *et al.*, 2001). Increased difficulty in finding work and poor adjustment at places of work influence the health status of individuals with LLA (Stover *et al.*, 1994). In a recent study, individuals with lower limb amputation expressed a strong desire for their work to be better adjusted to

the limitations presented by their disability. They also mentioned having problems concerning a possible lack of job promotion (Schoppen *et al.*, 2001).

Lower limb amputation results in considerable disability, and patients require skilled rehabilitation to achieve adequate restoration to function (Pandian *et al.*, 1999). Furthermore, the limited life expectancy of these patients after major amputation means that rehabilitation should be completed in the shortest possible time to maximise the quality of life of the remaining years (Condie *et al.*, 1996). For landmine victims however, more than 50% of the sample surveyed indicated that the average time spent while admitted to the hospital is hardly less than two months (Anderson *et al.*, 1995).

The extent of disability due to lower limb amputation varies considerably. In general, greater disability is associated with a higher level of amputation for both unilateral and bilateral amputees (Hsu *et al.*, 2000). Generally, individuals with bilateral lower limb amputations are more limited in functional mobility than those with unilateral lower limb amputations. This is because the more proximal the amputation, the more energy is demanded from the cardiovascular and pulmonary systems for prosthetic gait (Cutson and Bongiorno, 1996). In addition, due to body mass loss individuals with proximal amputation or bilateral amputation have reduced work capacity. In a study to evaluate motor capabilities and physical fitness, Kurdibaylo (1994) found that bilateral lower limb amputees showed less maximal oxygen intake than either unilateral lower limb amputees or non-disabled matched controls.

Therefore, there is a positive correlation between energy expenditure in ambulation and the level of disability. The higher the energy cost for amputation, the more work it takes to ambulate. However, for individuals with lower limb amputations, functional movement capabilities do not mainly depend on the level of amputation or anatomical functional condition of the residual limb. It was demonstrated that the functional capability of individuals with LLA depended largely on the dynamic capabilities of cardiac and respiratory systems (Kurdibaylo, 1994). Hence, exercise training needs to aim at developing cardiac and respiratory muscular systems' ability to adjust to the limb loss. It is the higher energy demand therefore, that mainly contributes to sedentary lifestyle in most individuals with greater disability or higher levels of amputation. This therefore suggests that interventions aimed at participation in physical activity need to have special considerations for individuals with greater disabilities.



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Substance usage, including tobacco smoking and alcohol consumption is a major risky health behaviour that forms part of an unhealthy lifestyle. In addition, a higher incidence of smoking was reported among amputees rather than general population in Scotland (Stewart, 1987). Swart (1998) noted that tobacco smoking is a potential danger to a wide range of chronic diseases. Furthermore, increasing rates of amputations due to peripheral arterial diseases have been related to tobacco smoking (Christman *et al.*, 2001). Christman *et al.* (2001) further indicates that exercise training

and cessation of smoking are major factors that prevent peripheral arterial disease, and smoking particularly increases amputation rates.

In addition, higher mortality rates appear to be due to decreased physical levels of activity and exercise (Kazmers *et al.*, 2000; Melzer *et al.*, 2001; Rose *et al.*, 1987). A physically inactive lifestyle is a major predisposing factor to peripheral arterial disease, which increases amputation rates (Christman *et al.*, 2001). Studies have highlighted the importance for lower limb amputees to include physical activity or exercise in their lifestyles (Christman *et al.*, 2001; Pitetti, 2000; Melzer *et al.*, 2001).

2.6 INVOLVEMENT IN HEALTH-PROMOTING BEHAVIOURS

For both the general population and the disabled individuals, engagement in health-promoting behaviours is fundamental. This entails participation in activities designed to enhance the quality of life and well-being while refraining from risk lifestyle behaviours, which often result in a deterioration of health. Among the activities that enhance quality of life and an individual's well-being, Stuijbergen *et al.* (2000) emphasizes participation in physical activity, stress management techniques and social support. Furthermore, a number of studies have highlighted the need to abstain from risky health behaviours such as tobacco smoking or drug use for physically disabled individuals in particular as well as the general population (Steele *et al.*, 1997; Stewart, 1987; Hogan *et al.*, 2000).

Although practising health-enhancing behaviours is undoubtedly critical for people with physical disabilities, involvement in health promoting activities for this vulnerable group of people may be far from reality. Health care professionals have clearly indicated that maintaining a suitable physically active lifestyle has a profound effect on all-cause mortality rates (Cooper *et al.*, 1999; Kailes, 2000; Rimmer, 2000). Furthermore, physical activity can reduce overall mortality rates from cardiovascular, pulmonary, metabolic and neuromuscular diseases. It also reduces the development of several different types of cancers, non-insulin-dependent diabetes mellitus, hypertension, osteoarthritis, osteoporosis and obesity (Rimmer, 2000; Vuori *et al.*, 1996; Cooper *et al.*, 1999; Davis, 2000). Vuori *et al.* (1996) further states that there are also short-term beneficial effects on psychological stress, depression, anxiety, mood and the general psychological well-being. Surprisingly, some studies have also noted that the level of health risk resulting from inactivity is similar to that resulting from smoking (Davis, 2000; Cooper *et al.*, 1999). Despite all these benefits, Rimmer (1999) is doubtful that the lives of the most physically disabled people constitute daily habitual physical activity patterns. Indeed the benefits of physical activity participation may not be comparable to health promotion intervention programmes already implemented even in developed countries (Cooper *et al.*, 1999).

The use of resources for health promotion may be expensive especially for the less developed countries. However, involvement in health-enhancing behaviours definitely far outweighs the current situations in which policy makers use resources mainly for expensive medical care after certain complications are irreversible. It is high time to

shift resources from conflicts and war to intensifying conflict resolution programmes so that resources can be used for the promotion of health-enhancing behaviours. Even for developed countries like the United States of America, it is crucial to shift not only from disability prevention but also more importantly to the prevention of secondary conditions (Rimmer *et al.*, 1996). Although the European Union has adapted strategic programmes since 1996 for promotion health-enhancing physical activity (Vuori *et al.*, 1996), much remains to be realized for special considerations of target groups such as the physically disabled and the elderly.

Despite the meagre achievements to promote health-promoting behaviours, their benefits are extensive. For example, sports and recreational activities increase integration of people with physical disabilities into society, and thus enhance their quality of life. Studies on health-related behaviours and their effects on quality of life have commended the need for involvement in other behaviours such as access to relevant information and stress management techniques (Cooper *et al.*, 1999; Rimmer *et al.*, 2000; Stuifbergen *et al.*, 2000; Stuifbergen and Rogers, 1997).

Interestingly, individuals with lower limb amputation have increasingly revealed curiosity to participate in recreational activities to improve their quality of life (Pandian *et al.*, 1999). Such lifestyle behaviour is significant to improve physical fitness as well as sociability and self-confidence that can lead to a full satisfying health status (Legro *et al.*, 2001). A physically active lifestyle also decreases morbidity rates among all individuals, particularly those who are already limited by a primary disability (Cooper *et*

al., 1999; Melzer *et al.*, 2001). Therefore, adequate rehabilitation needs to foster a rapid return to activities of daily living by increasing the physical capabilities of lower limb amputees (Pandian *et al.*, 1999). Although certain considerations, such as effective prostheses, make a positive contribution to the amputees' abilities to accomplish their daily functional tasks and recreational activities (Legro *et al.*, 2001), the task of the health care professional is paramount.

Undoubtedly, physically disabled individuals have not been sufficiently empowered to participate in activities that prevent development of secondary conditions. Stuijbergen and Rogers (1997) supported this argument noting that generally people with physical disabilities have been left to manage their lives with little help from health care professionals. Studies have advocated collective efforts to improve the lives of people with physical disabilities through health-enhancing behaviours (Cooper *et al.*, 1999; Rimmer *et al.*, 1996; Stuijbergen *et al.*, 2000). The strategy is to empower people with physical disabilities to take control of their lives by motivating them to engage in healthy lifestyle behaviours (Breslow, 1999; Davis, 2000; Kailes, 2000). Although one of the fastest growing areas in health promotion is health behaviour (Vollrath *et al.*, 1999), more concrete efforts in this field of interest for both clients and professionals need to be attained. The transformation of health behaviour needs to include topics related to living a physically active lifestyle, stress management, the cessation of smoking and coping strategies (Cooper *et al.*, 1999). In order to do this, a number of issues ought be considered in planning intervention strategies.

Issues to be targeted in health promotion interventions should consider a variety of factors. Stuijbergen and Roberts (1997) noted that resources including income and social support, transportation and socio-economical status, are related to health promotion behaviours. Such factors positively influence the selection and use of health-promoting behaviours and health outcomes. However, it is most important to consider barriers that prevent access to health promotion services for the prevention of further disability. Such barriers include inadequate facilities, lack of appropriate transportation, lack of support, inadequate resources and poor information about the available facilities (Smith, 2000; Stuijbergen, 1995).

2.7 HEALTH PROMOTION NEEDS OF THE PHYSICALLY DISABLED

Various studies identify a number of health promotion needs of people with physical disabilities (Dean *et al.*, 1985; Edwards, 1996; Forero *et al.*, 1996; Hogan *et al.*, 2000; Zola, 1982). The health promotion needs assessment of young people with physical disabilities indicated a higher rate of substance usage than their non-disabled fellow students (Hogan *et al.*, 2000). Substance usage including drugs and alcohol is reported among young people with different types of disabilities (Motet-Grigoras and Schuckit, 1986). Furthermore, students who experience asthma are more likely to drink alcohol than their non-disabled age mates (Forero *et al.*, (1996).

Tobacco smoking was reported among individuals with lower limb amputation, and this predisposed them to cardiovascular diseases (Stewart, 1987). Young people with

physical disabilities were far more likely to smoke cigarettes than their non-disabled peers (Forero *et al.*, 1996; Hogan *et al.*, 2000). However, some positive healthy lifestyle behaviours and attitudes are also indicated by some studies. School-aged children with physical disabilities are considerably less likely to smoke, drink alcohol or use drugs like marijuana (Steele *et al.*, 1995).

Young people with physical disabilities have recently been identified as living a more sedentary lifestyle or engaging in less exercise (Hogan *et al.*, 2000). According to Rimmer (1999), there appears to be no element of habitual physical activity among individuals with physical disabilities, and many live a physically inactive lifestyle. However, adolescents and young adults with spinal cord injuries identified planning an exercise program and referral to fitness centres as their main health promotion needs (Edwards, 1996).

Social isolation, low self-esteem and anxiety were reported among people with physical disabilities including those with lower limb amputation (Hogan *et al.*, 2000; Steele *et al.*, 1996; Stover *et al.*, 1994). Forero *et al.* (1996) reported that students with asthma, a medical condition that may result in considerable physical impairment, experienced more loneliness than their healthier peers. However, young people with physical disabilities demonstrated no differences in self-esteem and depression when compared with their fellow students. In addition, they had positive attitudes towards their parents, teachers and their non-disabled peers (Steele *et al.*, 1997).

Li (1998) also indicated that people with physical disabilities often have distinctive and individual needs in areas of employment, education, housing, personal services and health care. Therefore, they must often deal with structural, attitudinal and other barriers to fully participate in daily activities. Because of this, they may participate in fewer health promotion activities (Rimmer, 2000).

2.8 THE CONCEPT OF HEALTH PROMOTION AND DISABILITY

The concept of health promotion emphasizes self-care rather than expert care and promotes an active, independent attitude towards health care (Breslow, 1999; Smith, 2000). Access to knowledge and resources provides individuals with physical disabilities the basis for choices for health-promoting behaviours to sustain and enhance their quality of life (Stuifbergen and Rogers, 1997). Smith (2000) considers this issue in the context of health promotion as the distinction between intrinsic disability (without personal or equipment assistance) and the actual handicap (even with such assistance). Smith (2000) further indicates that disability is therefore not considered a personal characteristic but a gap between personal capability and environmental demand. Therefore, policy should focus not only on impairment and disability in the medical sense, but crucially on the prevention of handicap in the sense of the removal of the gap between the personal capability and the environmental demand.

The definition of health promotion as “activities directed toward increasing the level of well-being and actualising the health potential of individuals, families and communities/ societies,” is practically similar to the goal of rehabilitation (Breslow, 1999). This is so because the process of rehabilitation is designed to enable individuals with physical disabilities to use their residual resources to gain the maximum level of functional independence, hence adapting themselves to new lifestyles (Pandian *et al.*, 1999). In addition, the process of rehabilitation enables people with physical disabilities to have access to benefits and opportunities such as education, good and early childhood development, job opportunities and to share in any existing community development programmes (Office of the Deputy President, 1997).

Unfortunately, even in developed nations only a small percentage of people with physical disabilities have the opportunity to participate in structured rehabilitation programmes that can help them maintain their health and quality of life (Davis, 2000). Most conditions are diagnosed in outpatient settings, where brief appointments allow little or no time for discussion of health maintenance and health promotion in the context of a physically disabling life-long condition (Stuifbergen and Rogers, 1997).

A wider perspective of health promotion is the recognition of the health-promoting role and responsibility of all health professionals (Smith, 2000). However, health care professionals interested in providing health promotion services to enhance the rehabilitation of people with physical disabilities find the information specific to health promotion needs critically lacking (Stuifbergen and Rogers, 1997). Consequently,

people with life-long physically disabling conditions often face challenges of promoting their health and maintaining their quality of life with little help from health care rehabilitation professionals (Smith, 2000; Stuifbergen and Rogers, 1997; Rimmer, 1999).

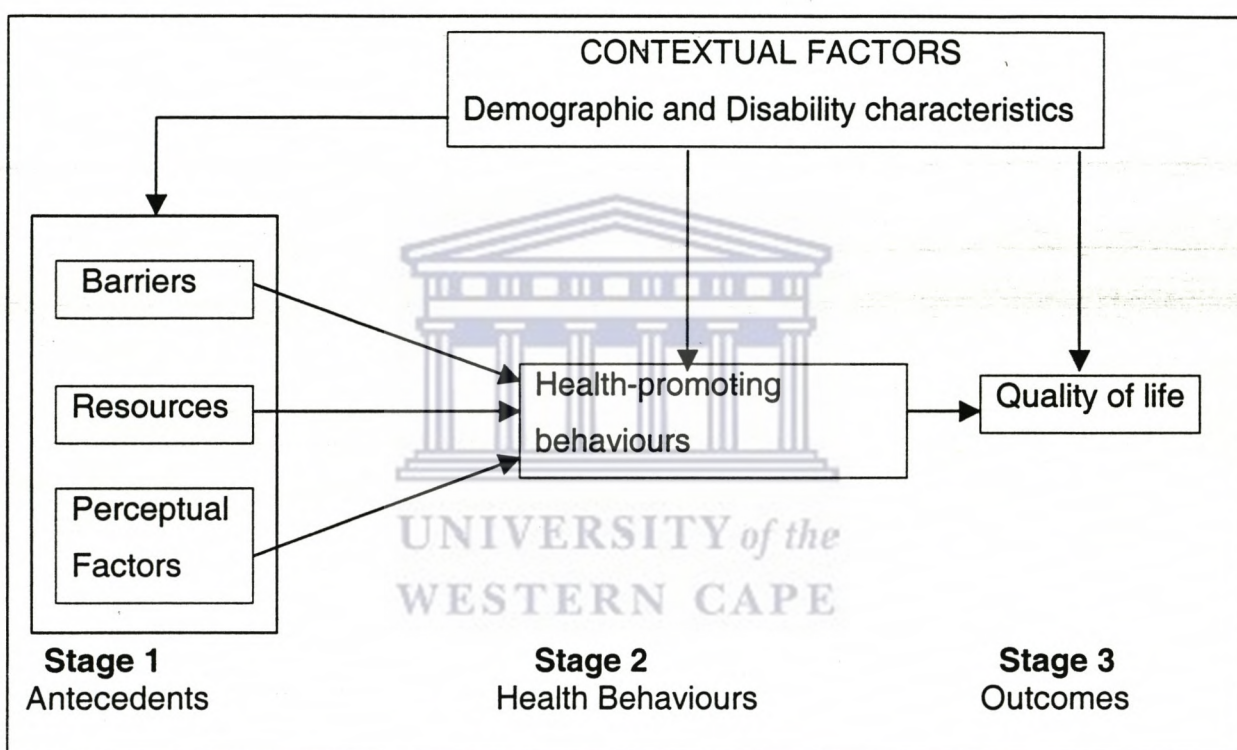
2.9 THE CONCEPTUAL MODEL OF HEALTH PROMOTION

The general conceptual model used in this study represents a synthesis of findings from the review of the literature. Stuifbergen (1995) proposed a process model comprising of factors that influence health-promoting behaviours and thus quality of life. The model proposed four antecedent factors that influence health-promoting behaviours, namely Demographic and Disability-related factors, Resources, Barriers, and Perceptual factors. According to Stuifbergen (1995), the antecedent factors have an influence on health-promoting behaviours, and thus on the outcome of quality of life. However, the Stuifbergen (1995) model does not indicate the relationship between Demographic and individual disability-related characteristics with other antecedent factors, such as Resources, Barriers and Perceptual factors.

Figure 2.1 illustrates a three-stage Conceptual Model proposed by Stuifbergen and Rogers (1997). The figure indicates the direction of the predicted relationship between specified antecedent factors and health-promoting behaviours, all of which influence the outcome of quality of life. The model specified the influence of Demographic and

individual disability-related characteristics on other antecedent factors, health-promoting behaviours, and on the outcome of quality of life.

Figure 2.1: Conceptual Model of Health Promotion and Quality of life for people with permanent physical disabling conditions. Source: Adapted from Stuifbergen and Rogers, 1997.



Contextual factors include demographic characteristics such as age, gender, employment status, and disability-related characteristics such as level of amputation (Stuifbergen *et al.*, 2000). They are believed to have an influence at each stage of the model. Contextual factors are visually represented as influences on previous circumstances called antecedents, mediating health behaviours, and quality of life

outcomes. Antecedents include the concepts of barriers, resources and perceptual factors, which serve as precursors to the next stage 2. The selection and use of health-promoting behaviours in stage 2 act as mediating influence between the antecedents of stage 1 and the outcome of quality of life in stage 3. In this model, quality of life is viewed subjectively as the individual's satisfaction with the domains of life perceived as most important (Stuifbergen *et al.*, 2000; Stuifbergen and Rogers, 1997; Stuifbergen *et al.*, 1994).

2.9.1 Contextual factors

Contextual factors include individual and disability-related characteristics that may influence health-promoting behaviours and quality of life directly or indirectly (Stuifbergen, 1995). For instance, amputation is a life-long physical disability, and although there are other causes of amputation, land mine injuries are the most common cause of amputation in countries after armed conflicts (Anderson *et al.*, 1995). Land mine injuries inflict ravaging wounds, and damage the body either by the blast or by driving dirt, bacteria, clothing and metal or plastic fragments into the tissue and bone (Stover *et al.*, 1994). Damage is rarely confined to one leg; lesser but still severe damage is frequently caused to the other leg. The shock wave from an exploding mine destroys blood vessels far up the leg, forcing the surgeons to amputate much higher than the site of the preliminary wound (Pearn, 1996a; Rith-Najarian *et al.*, 1998; Stover *et al.*, 1994).

2.9.2 Antecedent influences

Antecedents factors include the barriers, resources and perceptual factors that influence an individual to choose to engage in health-promoting behaviours (Stuifbergen and Rogers, 1997). Barriers, defined as perceptions regarding the unavailability, inconvenience, or difficulty of particular health-promoting options can be related to participation in exercise programs and self-examination of the stump (Stuifbergen *et al.*, 1990). They can also be primary prevention of behaviours such as a sedentary life, nutrition of high fat content, use of alcohol or smoking and stump skin inspection (Stuifbergen *et al.*, 2000).

A variety of resources, including income and social support are related to the selection and use of health-promoting behaviours and health outcomes (Stuifbergen *et al.*, 2000). Studies have indicated that social support is related to a positive family functioning and health-promoting behaviours. In a study on correlations of patients' perspectives of the result of lower extremity amputation and various variables, Matsen *et al.* (2000) reported positive correlations between social variables and perceived outcome. The authors indicated that patients were more likely to perceive a better quality of life if they were comfortably involved in active relationship with strangers. Resources have also been related to outcomes of health behaviours including functional disability, adjustment, depression, and quality of life (Schoppen *et al.*, 2001).

Perceptual factors, including specific self-efficacy for health practices and perceived demands of disability, have been reported to influence the possibility of engaging in health promotion behaviours (Stuifbergen and Rogers, 1997). For instance, Pitetti (2000) indicated that participation in physical activity for persons with lower limb amputation is directly related to the level of amputation. Self-efficacy, defined as beliefs about one's ability to successfully perform specific health behaviours, is influenced by barriers and resources and has direct effects on health-promoting behaviours (Stuifbergen and Becker, 1994).

2.9.3 Health-promoting behaviours

Health-promoting behaviours, stage 2 of the model, include ongoing behavioural, cognitive, and emotional activities engaged in to promote health and well-being (Stuifbergen, 1995). They include physical activity or exercise, eating practices, seeking of social support, and stress management (Stuifbergen and Rogers, 1997).

2.9.4 Quality of life outcomes

The quality of life outcome in this model is assessed by the measure of the functional status (Stuifbergen and Rogers, 1997). Most assessments however, rely on the assumption that a decrease in functional status corresponds to a decrease in the quality of life (Stuifbergen *et al.*, 1990). For instance, there may be approximately similar physical functioning among individuals with lower limb amputations, but with

great variations in quality of life depending on various changes in life circumstances. Therefore, these measures do not consider the significance attributed to exact domains of life (Stuifbergen *et al.*, 2000). Objective indicators including income, living situations, and physical functioning are commonly used to measure quality of life. However, such measures fail to indicate how individuals actually perceive their own lives. In contrast, subjective evaluations of quality of life represent individuals' perception of important life domains and satisfaction with the domains they judge as critical to their quality of life (Stuifbergen and Rogers, 1997; Stuifbergen, 1995).

2.10 THE USE OF BETWEEN-METHODS TRIANGULATION

The use of between-methods triangulation was employed in data collection. Between-methods triangulation may be defined as the combination of the research strategies using quantitative and qualitative methods (Rees and Bath, 2001). It can occur simultaneously or sequentially (Maher *et al.*, 1999, 2000; Rees and Bath, 2001). In this study, simultaneous triangulation of methods was utilized.

Between-methods triangulation is an increasingly popular methodology in research (Begley, 1996). It offers greater confidence in the validity of the study findings. The method also improves confirmation of the results and yields a more complete representation of the topic of investigation, that is to say completeness (Morse, 1991). Although several researchers have suggested that the fundamental aim of between-methods triangulation is one of confirmation (Begley, 1996; Bradley, 1995; Morse,

1991), others argue that triangulation could serve the function of completeness (Begley, 1996; Nolan and Behi, 1995 and Rees and Bath, 2001). In this study, between-methods triangulation was used for both completeness and confirmation of the study findings.

It was important to employ the two methods since they complement each other. This methodological approach, called triangulation of methods combines quantitative and qualitative styles of research that provide a more complete picture of the topic of enquiry than that supplied by either method alone (Avis, 1995). The use of both methods produces results and conclusions that are more dependable (Avis, 1995; Rees and Bath, 2001). In a recent study, Rees and Bath (2001) used the triangulation method in the analysis of the information sources given by partners of women with breast cancer. By combining both quantitative and qualitative data, the authors found that the study possessed a good convergent validity that resulted in further confirmation of the study findings.

For the quantitative research methodology, a survey questionnaire was used to collect data on the number of individuals involved in various health-related behaviours, such as physical activity or substance usage. In addition, health promotion needs were identified from the reported and enumerated responses of the participants. However, the exact reasons for involvement in particular health risk behaviours, such as smoking habit or use of drugs and sedentary lifestyle was only clarified in face-to-face interviews, which is part of qualitative research methodology.

Therefore, the combination of these methods offers a greater complimentary effect in the study findings (Rees and Bath, 2001). It has been further argued that although most researchers develop expertise in one style, the two methods or styles have significantly different complementally strengths (Neuman, 2000).



CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter explores the method utilized in the study, in which data collection was done by a self-administered questionnaire survey and face-to-face interviews. Included in the chapter are descriptions of research setting, study sample and study designs. The chapter describes the use of radio announcement and posters to communicate to participants in the study instead of using post office services. A description of pilot studies and how data analysis was carried out is given. Finally, the issues of ethical consideration regarding the study are reported.

3.2 RESEARCH SETTING

The study was carried out at three hospitals and two centres in the Republic of Rwanda. The hospitals included Central Hospital of Kigali, Kanombe Military Hospital and Ruhengeri Provincial Hospital. In order to make the study representative and increase the size of the study sample, the study was also carried out in two centres considered to have a high number of individuals with lower limb amputation. These centres were Gatagara Centre for Physically Handicapped Persons, and Nyagatare Military Demobilization Settlement.

3.2.1 Central Hospital of Kigali

Central Hospital of Kigali is situated in Kigali Ville Province in the centre of Kigali, the capital city of Rwanda. It is a teaching and a national referral hospital to which most conditions from remote rural areas are referred for treatment or rehabilitation. The relatively high number of facilities at this hospital, in addition to its being centrally placed, makes it the most preferable hospital for a referral system. It has the largest renovated and well-equipped physiotherapy department and the largest referral orthopaedic workshop in the country to which most individuals with lower limb amputation are referred for prosthetic fitting and rehabilitation.

3.2.2 Kanombe Military Hospital

Kanombe military hospital is situated in Kigali Rural province, approximately 15 km from the centre of Kigali, the capital city. Kanombe military hospital is mainly a referral hospital for the military war casualties, but also meets the needs of the civilian population. It was therefore recently renovated and equipped to serve a larger population. Due to the recent war in Rwanda, although the civilian population was mostly affected, a considerable number of the military population also sustained major injuries due to gunshot wounds and land mine blasts that culminated into lower limb amputations (Farrow *et al.*, 1997; Farrow, 1998). There is an orthopaedic workshop which is a centre that provides prosthetic fitting and rehabilitation services to a large

number of lower limb amputees nationally, mainly casualties from the national defence force and the national police force.

3.2.3 Ruhengeri Provincial Hospital

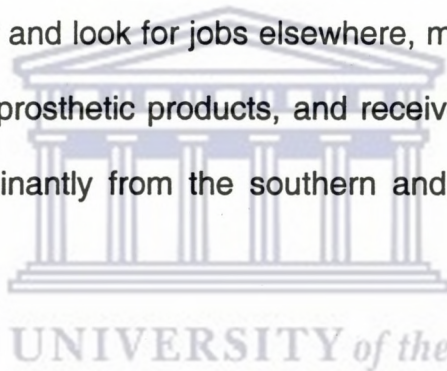
Ruhengeri Hospital is found in the northwest of the country, in Ruhengeri province about 97 km from Kigali, the capital city. It is a provincial hospital, receiving amputee patients referred from the northern and north-western parts of the country for rehabilitation and prosthetic fitting. Many individuals with lower limb amputation receive rehabilitation services at Ruhengeri Provincial Hospital. This is because many land mines were planted by fleeing former Rwandan soldiers, that is to say former '*Forces Armées Rwandaises*' (EX-FAR) in the northern and north-western parts of the country.



3.2.4 Gatagara Centre for the Physically Handicapped

Gatagara centre for the physically handicapped, normally termed '*Gatagara Centre des Handicapés Physiques*', is situated in Gitarama Province 74 km south of Kigali. This centre was started in the early 1950s by a Catholic priest who cared for physically disabled persons, mainly those with lower limb amputations and those with post poliomyelitis sequelae.

Initially, the centre was started as an association named after its founder, Father Fraipont as "*Les amis de l'abbé FRAIPONT*" meaning '*The friends of father FRAIPONT*'. Later on, a Catholic congregation called '*Brothers of Charity*' continued to manage the centre. The importance of the centre was to care for the socio-economic needs of people with different disabilities through basic education and vocational training like making prostheses and orthoses. At present, the centre manages a primary school, a school for blind children, a workshop for making prostheses and orthoses, and a training centre for assistant laboratory technicians. Afterwards the centre established acts of charity to provide accommodation for physically disabled persons who would qualify and look for jobs elsewhere, mainly in Kigali. This centre is still famous for its quality prosthetic products, and receives a high number of people with amputations, predominantly from the southern and south-western parts of the country.



3.2.5 Nyagatare Military Demobilisation Settlement

Nyagatare Military demobilization settlement is situated in Umutara Province in Nyagatare district about 145 km from Kigali. This settlement is a programme that was first launched in 1997 to meet the need for accommodation for many military persons with various disabilities who were demobilised from the national defence force (Mugabo, 2001).

Originally, there were about 500 persons with various disabilities due to land mine blasts, fragments from different ordnance and gunshot wounds. These resulted in a variety of disabilities like amputation, blindness, deafness, those with fragments in the head or near the spinal nerves, and those with psychiatric conditions. Currently, there are about 300 persons in this settlement, one third of which are individuals with lower extremity amputation (Mugabo, 2001).

Since Central Hospital of Kigali and Kanombe Military Hospitals are referral hospitals, participants were from various provinces around the country. In fact, they were mainly from provinces far from where the hospitals and centres are situated. Therefore, participants in this study were a reasonably representative sample of individuals with lower limb amputation in the country¹.

3.3 STUDY POPULATION AND SAMPLING

All adult lower limb amputees who voluntarily agreed to participate in the study were recruited. Three hundred and thirty four (334) participants from the three hospitals and two centres participated in the quantitative part of the study. Purposive sampling was used to recruit fifteen participants for interviews, three from each of the three hospitals and the two centres. Purposive sampling is used in special situations in which a

¹ The map of Rwanda illustrating various places of the research setting has been included as appendix G at the end of this thesis.

researcher selects unique cases that are especially informative for in-depth investigations (Armitage and Berry, 1996).

Inclusion criteria were individuals between 12 and 60 years, those who could read and write, and those with cognitive ability to comprehend and complete the questionnaire without assistance. Exclusion criteria were individuals less than 12 years old or more than 60 years old, those who could not read and write, those with severe cognitive problems, and those with any other disabilities such as blindness or deafness.

3.4 STUDY DESIGN

Both descriptive quantitative and qualitative analytic designs were used in the study. Neuman (2000) indicated that between-methods triangulation adopted in this study makes the study findings more informative and comprehensive.

Therefore, besides quantitative assessments, the informants' qualitative points of views were obtained using face-to-face interviews. Quantitative assessments using a self-administered questionnaire and qualitative work (guided by the researcher) were utilized in order to present the participants' true perspective of their health promotion needs. This provided a valid reflection of the participants' health-related behaviours and their own experiences with amputation rather than using either quantitative or qualitative methods alone.

3.5 METHODS OF DATA COLLECTION

This study utilized two methods of data collection, namely quantitative and qualitative. For quantitative data, a survey method using a self-administered questionnaire was carried out (**Appendix E**). Questionnaires were sent to all individuals with unilateral or bilateral lower limb amputation who were willing to participate in the study. For the qualitative component of the study, guided in-depth face-to-face interviews were carried out.

3.5.1 Quantitative Method

Quantitative assessments comprised a self-administered questionnaire designed from literature (Hogan *et al.*, 2000; Stuijbergen *et al.*, 2000).

Section A comprised contextual factors, from items 1 to 11 that have a potential influence on health-related behaviours (Stuijbergen *et al.*, 2000). These items were developed from measurements by Stuijbergen (1995) who indicated that contextual factors were significantly related to positive adjustment and improving self-concept. They included demographic characteristics such as age, gender, marital status, employment status, as well as disability-related characteristics, like level of amputation. For example, item 8 measured the level of amputation since the energy cost of participation in exercise is directly related to the level of amputation (Pitetti, 2000).

Section B of the questionnaire utilized a range of items, from 12 to 19. These items were developed from a health promotion needs assessment of military individuals with various physical disabilities in the United States of America (Wright-Patterson, 1998). Although there are other health-related behaviours that influence the quality of life, such as stress management (Stuifbergen *et al.*, 2000), the variables assessed in this study included physical activity, and the use of different substances like tobacco, drugs, and alcohol consumption.

Participants were requested to respond to an item about physical activity, *'Do you participate in any kind of physical activity or exercise on a regular basis like walking, weight lifting or cycling on a stationary bicycle for a half an hour each time?'* This was an initial item to assess participation in physical activity as a health-related behaviour. This item and others, to assess substance usage, were given a *yes* or *no* category response.

Follow up survey items, 13 and 19, demanded frequency of participation in physical activity and alcohol consumption. These items were given four category responses: *everyday, 3 times a week, once a week, and hardly ever or never.*

Section C: In addition to demographic influences, items 20 to 26 were included, to assess other factors that have a potential influence on the health-related behaviours of

people with physical disabilities (Stuifbergen and Rogers, 1997). Responses to the first five of these items were (1) YES, (2) NO, and (3) NOT SURE, as the third neutral response. In addition, land mines, which appeared to be the most common cause of amputation in Rwanda, usually affect mainly the youth who are the most dynamic people in the society (World Health Organisation, 1999; World Health Organisation, 2000a). Due to the spontaneous and constant social interactions among the youth, peer influence was considered as a significant factor in health-related behaviours. Therefore, for assessment of peer influence, four sub-scales for item 27 were created. These items consisted of: *My friends drink a lot, my friends smoke cigarettes/ pipe tobacco or chew tobacco a lot and my friends spend a lot of time in clubs watching TV, video films a lot.* Responses to these items were (1) strongly agree, (2) agree, (3) disagree strongly, (4) disagree, and (5) I do not know, as neutral response.

A number of other issues identified from literature, which influence health-related behaviours, were assessed. These items from 28 to 30 included seeking and receiving professional social support, as well as psycho-social and self-perception (Hogan *et al.*, 2000; Steele *et al.*, 1997; Stuifbergen and Rogers, 1997).

Section D comprised a set of items, from 31 to 45 that identified programmes and activities the participants perceived as essential to improve their well-being. These items assessed perceived health-related needs of the participants in the quantitative part of the study.

Considering the characteristics of the study population and the researchers' prior interaction with individuals with lower limb amputation, these were the most important variables to measure.

3.5.2 Qualitative Method

Face-to-face interviews were used to provide in-depth descriptions of the informants' health-related behaviours, and the reasons for their engagement in certain lifestyles. The guided interviews developed from literature (Stuifbergen, 1995) were purposeful conversations during which the participants' lifestyle experiences were explored. The interviews started with a 'grand tour' question to set the tone of the interview, and to let the participants determine what is important for them to tell about living with a long-standing disability (Stuifbergen and Rogers, 1997).

Consequently, the 'grand tour' question for this study was *"Tell me what it is like for you to live with amputation, how does amputation affect your life?"* The remainder of the interview guide consisted of a series of guided probes that endeavoured to obtain an in-depth justification of the practice of various health-related behaviours. The interviews were guided; purposeful conversations during which the participants' lifestyle experiences, and the meaning attached to those experiences were explored in detail.

3.6 TRANSLATION, RELIABILITY AND VALIDITY OF THE STUDY

A professional translator translated the questionnaire from English to local Kinyarwanda language (**Appendix F**) since the majority of the participants do not know English. In order to ensure that the translated questionnaire in the local Kinyarwanda language assessed what the original English version intended to assess, another translator translated the questionnaire from Kinyarwanda language back to English. This version was the same as the original questionnaire set in English. Therefore, translating the questionnaire in Kinyarwanda language back to English eliminated the possible loss of validity.

Reliability and validity are fundamental concerns in all measurements. Reliability refers to dependability or consistency of the measurements (Redfern and Norman, 1994; Carr, 1995). By utilising both quantitative and qualitative methods simultaneously, the results were more reliable than if one method was used alone. Although the two methods operate from entirely differing scopes, related areas have been identified (Neuman, 2000). Integrating the two methods called triangulation of method reduces the possibility of bias and produces results that are more reliable with complimentary strengths (Rees and Bath, 2001).

3.7 PILOT STUDIES

Pilot studies were carried out to pre-test the use of the questionnaire, thus determining the content validity of the instrument for possible changes before it was administered. The questionnaire was therefore pre-tested for a period of two days on eight individuals with LLA who would not participate in the study. A number of changes were made following the responses given by the participants. When the majority responded to an item on the type of the ambulatory device they used, their responses prompted the investigator to include another item on the condition of ambulatory devices. The majority ticked an answer and included the condition of the ambulatory devices they used, such as *'Provisional wooden prosthesis'* but in a very poor condition or *'Definitive polypropylene prosthesis'* in a poor condition or a repairable condition.

For the item on causes of amputation, almost all participants in the pilot study included *'direct trauma such as accidents, machete wounds or consequences of direct physical attacks'* under 'other causes'. Therefore, given the circumstances of war in Rwanda where people were directly attacked and killed, *'trauma'* was regarded as a major cause of amputation, and thus included in the alternatives given on the causes of amputation.

Health-related programmes which participants perceived as essential to attend, included programmes on the prevention and awareness of the human immuno-

deficiency virus and acquired immune deficiency syndrome (HIV/ AIDS). Therefore, teachings on HIV/ AIDS programme was regarded as an important item, and thus included in the questionnaire.

3.8 PROCEDURE

Radio announcement and posters were used to request interested persons with lower limb amputation to participate in the study. The prospective participants included those who were receiving or had received rehabilitation services from the five centres. Radio announcement had always been used, and was a quicker and more efficient means of communication with persons with disabilities. For instance, when lower limb amputee patients had their provisional wooden prostheses changed to definitive polypropylene prostheses, a high number of amputee patients turned up following the radio announcement.



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Most people live in rural areas where postal services are unavailable, and for those in more urban areas who have postal services, they may be unreliable, as it may take too long for the questionnaires to reach the participants or reach the researcher after completion. Due to the low educational background and poor socio-economic status that characterize the majority of the Rwandan population, most people, especially in rural areas, do not read newspapers or watch the national television. Therefore, for the majority of Rwandan society, the main reliable source of information remains by far the national radio.

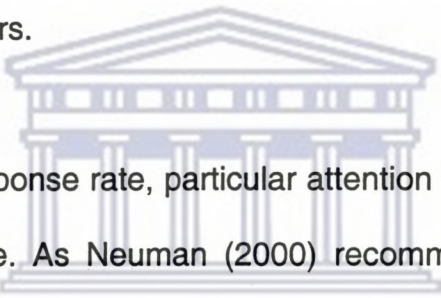
The dates and time of meetings with individuals expressing an interest in the study were again announced over the radio and posters were put up at the respective hospitals and centres. In addition, detailed information regarding the importance of the study and issues related to anonymity were put on the posters. Six newly qualified physiotherapists were recruited as field research assistants, and were introduced to the participants. The latter were requested to co-operate with field research assistants. The field research assistants distributed the questionnaires and collected them after completion. This enabled the researcher to have an ample time to organise and carry out the interviews. The purpose and possible benefits of the study were explained to the participants by either the investigator or field research assistants. Therefore, the study was done in two main phases: questionnaire surveys and face-to-face interviews.



3.8.1 Questionnaire Survey

In the first phase, questionnaires were sent to participants by field research assistants either through rehabilitation assistants or nursing aids working at the three hospitals and the two centres. Individuals with lower limb amputation who were hospitalised, or lived near the respective hospitals, or lived at the centres where the study was based were requested to collect the questionnaires and to return them after completion.

Two follow-up reminder letters were sent to the participants who had not completed and sent the questionnaires. As Neuman (2000) recommends, the first reminder letters were sent one week after distributing the questionnaires. Since only 261 questionnaires had been returned after two weeks, the second set of reminder letters were sent to the participants. In the reminder letter, participants were kindly requested to complete and send the questionnaires. Each time reminder letters were sent, they were accompanied by posters and radio announcements reminding the participants to comply. Every time posters were put up, the paper used was in a different colour and the posters were written in a different font and style to differentiate one from the other in order to attract the readers.



In order to have a high response rate, particular attention was given to the format and layout of the questionnaire. As Neuman (2000) recommended, an endeavour was made to construct the questionnaire clearly, neatly, and easy to follow on a special paper. The questionnaire was written on yellow paper since current evidence shows that documents are most easily read when black ink is used on yellow paper. In addition, questionnaires on white paper easily merge into other papers on a desk, and this increases the risk of misplacing them, which could decrease the response rate (Chesson, 1993).

Moreover, each questionnaire had a cover or face sheet, the respondents' identification number, instructions printed in a different style and in italics, and a letterhead. In order to leave the respondents with a positive feeling about their

contribution, each questionnaire ended with 'Thank you for your participation'. For the purpose of anonymity and confidentiality, an envelope in which to seal the completed questionnaire accompanied each questionnaire (Neuman, 2000).

3.8.2 Face-to-face Interviews

In the second phase, audiotape recorded interviews of about 45 to 60 minutes were carried out with fifteen separate participants.

Appointments for interviews were arranged at a mutually acceptable time and place. At every initial contact, informed consent was obtained from each of the participants in the interviews. During the interviews, participants were encouraged to tell their own story about their health promotion needs, any issues pertaining to their health-related behaviours, their lifestyle and all the related influences.

After the interviews, audiotape recorded data was presented to the participants to confirm or make changes so that any new developing ideas and categories could be agreed upon and clarified.

3.9 METHODS OF DATA ANALYSIS

Quantitative and qualitative data were analysed separately. Qualitative data was used to complement the quantitative survey data, and vice versa, thus presenting a deeper understanding of the study findings.

3.9.1 Quantitative analysis

Initial items to assess participation in physical activity, use of drugs, smoking habit or alcohol consumption, were given a *yes* or *no* category response. Follow up survey items that demanded the level of participation in physical activity and alcohol consumption were given five category responses, and the measure was scored 1-5. The lower scores represented participation that was more frequent in terms of consumption.

Responses to items on factors that influenced health-related behaviours were (1) YES, (4) NO, and (3) NOT SURE, as neutral response, which was recorded to 'system missing'. In order to determine peer influence on participants' involvement in health-related behaviours, Pearson's correlation coefficient was utilized. For the correlations to be meaningful, logical re-arrangement of the responses was done. For example, in the case of peer influence on drinking, *strongly agree* corresponded to participants'

drinking *everyday*, while *agree* corresponded to drinking *3-4 times a week*. On the other hand, *hardly ever or never* was related to *strongly disagree*.

All other survey questions such as those on substance usage were dichotomised into a *yes* or *no* response categories. Ambiguous responses, where the respondents ticked in two boxes, were recorded to 'system missing'.

Descriptive statistic analysis, using the Statistical Package for Social Science (SPSS) version 10.0, was employed to obtain a profile of the study population. Health-related behaviours, factors that influence selection and choice of these behaviours were presented using frequency tables, histograms, and linear graphs with markers at each value. Demographic characteristics were mainly illustrated using frequency tables.

The relationship between various variables, such as participation in physical activity or exercise and the respondents' age groups were analysed using inferential statistics. For instance, the chi-square test (χ^2 -test) and Fisher's exact 2-Tailed tests of independence were used to test for associations between various variables. For instance, Fisher's exact 2-Tailed test was used to indicate the level of significance between gender and participation in physical activity, while the χ^2 -test was used to test for association between frequency of physical activity participation and gender. In addition, Pearson's correlation coefficient was used to determine peer influence on the participants' choice to engage in a number of health-related behaviours. In all cases

where tests of independence were employed, a p -value of 0.05 or less was chosen to reflect a statistical significance.

3.9.2 Qualitative analysis

Analysis of the qualitative data began with the translation and transcription of interviews into English. Notes and quotations were initially written in the local Kinyarwanda language, the language in which the participants expressed their views. In most cases, an attempt was made for the translations to retain their original words, which would otherwise have been lost in the process of translations. Some actual words that were used by the informants were included verbatim in the text in order to present the informants' exact feelings.

All the notes and audiotape recordings of the interviews were transcribed precisely word for word. The transcriptions were compared to audiotape recordings and field process notes several times to verify accuracy (Neuman, 2000). After reading the transcriptions of all the interviews and process notes a number of times, analysis of all interview data began with content analysis.

Analysis was a procedure that started with discovering strong themes running through the data (Stuifbergen and Rogers, 1997). In this way, data was coded in broad categories according to the research questions. For instance, "What were the health-related behaviours the participants were engaged in?" Alternatively, "What factors

influenced the participants' involvement in certain health-related behaviours?" In the second stage, any data that depicted the smallest information units was identified (Rees and Bath, 2001). An information unit is any smallest amount of information that is informative by itself (Rees and Bath, 2001). In the final stage of the analysis, information units were categorised into themes related to health-related behaviours, reasons for engaging in various behaviours and factors that influence involvement in certain behaviours. After establishing the themes, corresponding verbatim quotations were used to support all themes. In order to maintain anonymity, participants' names were changed and cited using the code **A1** to **A15** for all the participants.

In order to gain a deeper understanding of the results, quantitative data was compared and supplemented by qualitative analysis and vice versa to qualify the process of between-methods triangulation (Neuman, 2000; Nolan and Behi, 1995; Redfern and Norman; Rees and Bath, 2001).

To achieve triangulation for confirmation, convergent, inconsistent and contradictory results between textual qualitative data and numerical data were determined. In order to achieve triangulation for completeness, numerical data that expanded on interview findings were highlighted (Rees and Bath, 2001).

3.10 ISSUES OF ETHICAL CONSIDERATIONS

Permission to carry out the study was requested from the Minister of Health since there is no research ethical committee in Rwanda (**Appendix A**). In addition to the informed consent from the Minister of Health (**Appendix B**), various authorities under different institutions such as the Ministry of Defence were requested to conduct a study in their institutions. In each case, an informed consent was obtained before carrying out the study (**Appendix C**). It was explained in the letter to the participants that participation in the study was anonymous and voluntary (**Appendix D**). All the information that would be obtained would be confidential. Furthermore, the health promotion needs assessment would be used to plan health promotion interventions to promote the quality of life of all individuals with physical disabilities, particularly those with lower limb amputation.

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For the qualitative part of the study, every individual participant who agreed to participate in the study, signed a consent form before participating in a 45 to 60 minutes audiotape interview.

CHAPTER FOUR

RESULTS

4.1 INTRODUCTION

In this chapter, the quantitative results of the socio-demographic characteristics of the study population are described. These comprise age, gender, education, employment status and disability-related characteristics. A number of health-related behaviours and factors that influence these behaviours are described. Various relationships between health-related behaviours and demographic characteristics are explained. In giving the accounts of the interviews, the exact language and phrases used by the participants were preserved. However, for more clarity in the flow of ideas, the order of the contents was sometimes slightly altered. For purposes of anonymity and confidentiality, the transcribed quotations of data from the interviews are cited in the cryptogram **A1** to **A15**.

4.2 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

Out of a total of 386 participants who received the questionnaires for the quantitative part of the study, 334 responded, and thus the response rate was 86.5%. Forty-four questionnaires were not returned, and eight questionnaires were incomplete and therefore not eligible for data analysis.

The participants' mean age was 30.4 years, with a standard deviation of 13.4. Table 4.1 presents the socio-demographic characteristics of the study sample. Two hundred and sixty seven (80%) participants were males and 67 (20%) were females. Most participants

(46.2%) were single, followed by 131 (39.2%) who were married. The smallest percentage (3%) of the participants were either divorced or separated. With regard to the participants' education, the majority (49.1%) had primary school education. However, 86 (25.7%) had never gone to school, and only 82 (24.6%) had attended secondary education. Although the majority of the participants (43.7%) were unemployed, 104 (31.1%) were employed, and 62 (18.6%) others were mainly students or pupils, and street beggars.

Table 4.1: Socio-demographic characteristics of the study sample (n=334)

<i>Variable measured</i>	<i>Characteristics</i>	<i>Number</i>	<i>Percentage</i>
<i>Gender</i>	Male	267	80
	Female	67	20
<i>Marital status</i>	Single	155	46.4
	Married	131	39.2
	Divorced or separated	10	3.0
	Widowed	38	11.4
<i>Education</i>	Never went to school	86	25.7
	Primary 1 to 6	164	49.1
	Secondary 1 to 3	62	18.6
	Secondary 4 to 6	20	6.0
	Tertiary education	2	0.6
<i>Employment status</i>	Active duty	104	31.1
	Dependent	20	6.0
	Retired	2	0.6
	Unemployed	146	43.7
	Others	62	18.6

4.2.1 Participants' profiles in relation to Provinces

Table 4.2 presents the provinces the participants came from. Most participants (28.1%) were from Kigali Ville province, followed by Kigali Rural province (17.4%). The smallest percentage of participants came from Kibuye (0.6%) and Cyangungu (1.8%) provinces. Although most participants had ambulatory devices, a small number considered their devices to be in a good functional condition. The details of participants' distribution according to Districts have also been illustrated.

Table 4.2: Participants' profiles in relation to Provinces (n=334)

Provinces	Participants' Gender		Employment Status		Have ambulatory Devices		Good functional Condition of Devices (n=311)	
	Male	Female	Active	Non active	Yes	No	Yes	No
1. Kigali Ville	75	21	18	76	93	3	16	75
2. Kigali Rural	44	14	22	36	54	4	16	38
3. Gitarama	14	4	2	16	16	2	2	14
4. Byumba	20	6	6	20	23	3	6	18
5. Kibungo	6	2	2	6	8	-	-	8
6. Ruhengeri	32	8	2	38	34	6	6	30
7. Gisenyi	6	2	2	6	5	3	2	4
8. Kibuye	2	-	-	2	2	-	-	2
9. Umutara	46	4	44	6	50	-	14	32
10. Butare	10	4	4	10	14	-	2	12
11. Gikongoro	10	-	2	10	8	-	4	6
12. Cyangungu	2	2	2	2	4	-	-	4
Total	267	67	106	228	311	23	68	243

4.2.2 Disability-related characteristics

Table 4.3 illustrates the participants' profiles of disability-related characteristics including level of amputation, type and condition of ambulatory devices. The majority of the participants had either unilateral below-knee (40.7%) or unilateral above-knee (40.1%) amputation. The smallest percentages had bilateral below-knee (1.2%) and bilateral above-knee (4.2%) amputation.

Three hundred and eleven (93.1%) participants had ambulatory devices. Although 94 (30.2%) participants had definitive prostheses, a large percentage (45.9%) had either elbow crutches or axillary crutches, and 22 (7.1%) participants used wheelchairs. One hundred and thirty-two (41.5%) participants considered their ambulatory devices to be in a very poor condition, while 68 (21.9%) considered their ambulatory devices to be in a good functional condition.



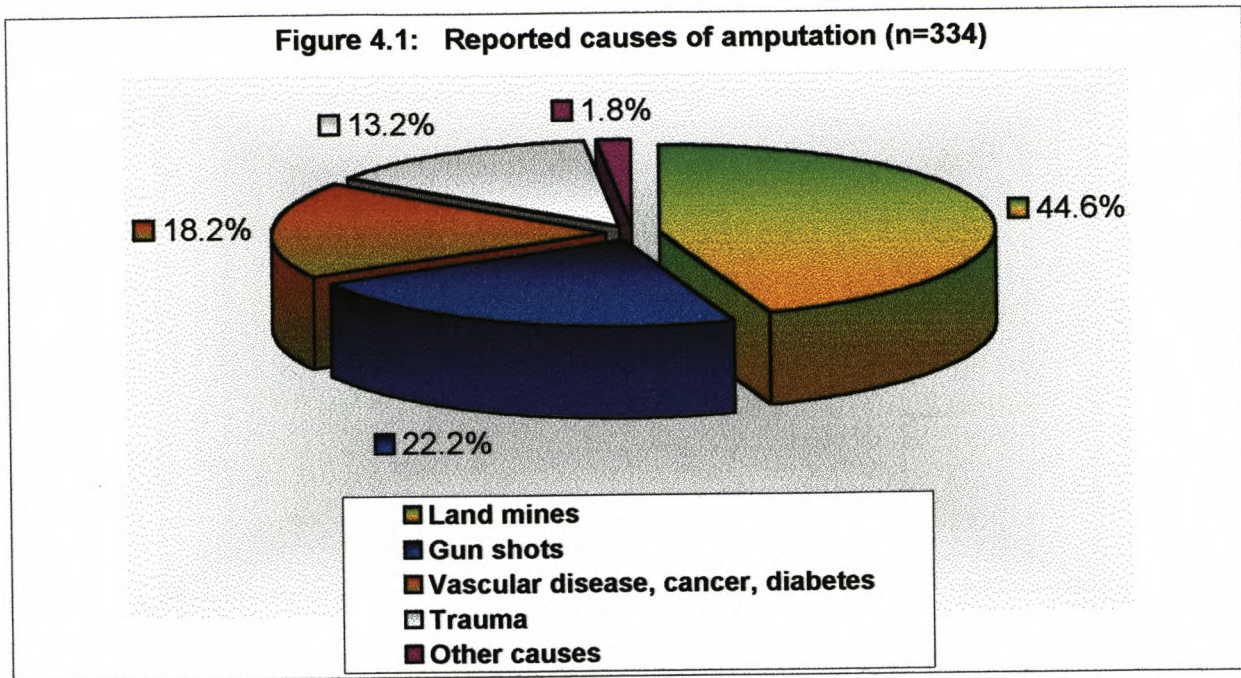
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Table 4.3: Participants' disability-related characteristics (n=334)

Variables measured	Characteristics	N	%
<i>Level of amputation</i>	Toe or partial foot	14	4.2
	Unilateral below-knee	136	40.7
	Unilateral above-knee	134	40.1
	Knee disarticulation	16	4.8
	Bilateral below-knee	4	1.2
	Bilateral above/ below knee	16	4.8
	Bilateral above knee	14	4.2
<i>Type of ambulatory device</i> ¹	Provisional prostheses	34	10.9
	Definitive prostheses	94	30.2
	Wheelchairs	22	7.1
	Pylons	18	5.9
	Axillary crutches	56	18.0
	Elbow crutches	87	27.9
<i>Condition of the device</i> ¹	Good and functional	68	21.9
	Repairable condition	109	35.0
	Very poor condition	132	42.5
	Others	2	0.6

¹N= 311

With regard to the causes of amputation, Figure 4.1 presents the percentages of various causes of amputation reported in the study. The most common cause of amputation was land mines (N=149, 44.6%), followed by complications of gun shot injuries (N=74, 22.2%). Sixty-one (18.2%) participants had amputation due to diseases, such as peripheral vascular disease, diabetes and cancer. Forty-four (13.2%) had amputations because of trauma, such as accidents or direct confrontation using machetes, while other causes of amputation like snake bites were reported by six (1.8%) participants.



4.3 HEALTH-RELATED BEHAVIOURS AND INFLUENCING FACTORS

The participants' health-related behaviours assessed included participation in physical activity and substance usage including the use of tobacco, drugs and alcohol.

4.3.1 Participation in physical activity and influencing factors

Two hundred and sixteen (64.7%) participants did not participate in any kind of physical activity or exercise, while 118 (35.3%) participants participated in some kind of physical activity or exercise. Among those who participated in physical activity (N=118), 48 (40.7%) participated on a daily basis, 40 (33.9%) participated three times a week, 25 (21.2%) participated once a week, and 5 (4.2%) participated only a few times a month. A number of issues, such as socio-demographic factors and barriers, influenced participants' choice to take part in physical activity.

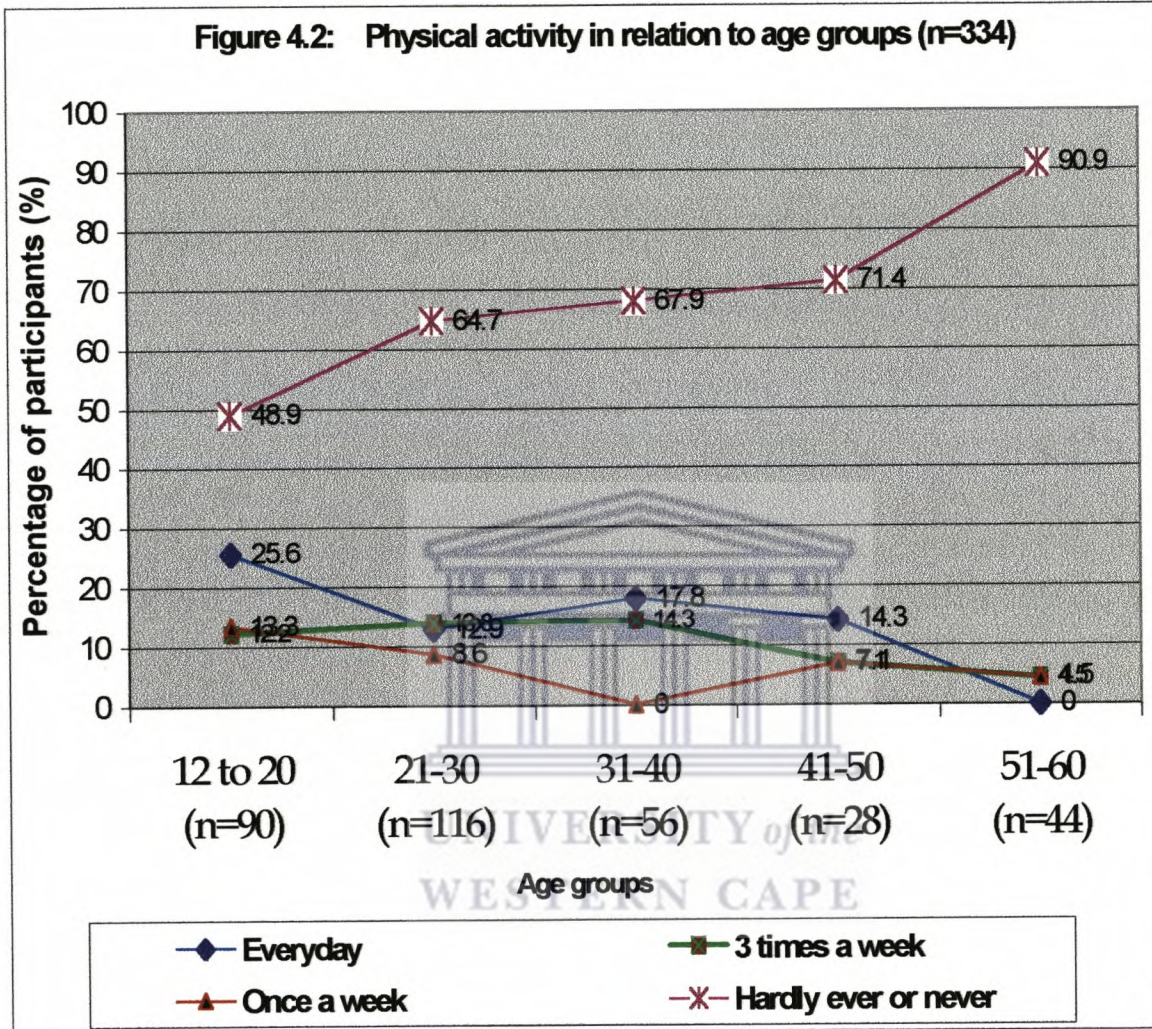
4.3.1.1 *Physical activity participation in relation to age groups*

Figure 4.2 illustrates participants' involvement in physical activity in relationship to age groups. The highest percentage of participants (90.9%) who hardly ever or never participated in physical activity was in the age group 51-60 years, while the lowest percentage of participants (48.9%) was in the age group 12-20 years. Only 2 (4.5%) participants participated three times a week, and a similar number who participated once a week were in the age group of 51-60 years.

The majority of participants (N=23, 25.6%) who participated in physical activity every day were in the age group 21-30 years. The second highest number (N=15, 12.9%) of participants who participated every day was in the age group 21-30 years, followed by 10 (17.8%) in the age group 31-40 years. The number of participants who participated three times a week was 11 (12.2%) in the age group 12-20 years, 16 (13.8%) in the age group 21-30 years, and 8 (14.3%) in the age group 31-40 years. An equal number of participants (N=2) who participated three times a week were in the age group 41-50 years (7.1%) and 51-60 (4.5%). The highest number of participants who participated in exercise once a week was 12 (13.3%) in the age group 12-20 years, followed by 10 (8.6%) in the age group 21-30 years.

Due to the expected small cell sizes, initial collapsing of some cells was inevitable in order to use statistical independent tests. Using the χ^2 -test, there was a significant difference between the respondents' participation in physical activity and their age groups

($p = 0.008$). However, more of the younger participants took part in physical activity than the older participants.



4.3.1.2 Physical activity in relation to gender, education and employment status

Table 4.4 presents the figures of frequency of participation in physical activity in relation to gender, education and employment status. Almost two-thirds of the participants

(N=334) hardly ever or never participated in physical activity. These included 178 males and 38 females. Twenty-seven subjects (23 males and 4 females) participated in physical activity once a week, another 41 (29 males and 12 females) participated three times a week, and 50 subjects (37 males and 13 females) participated on a daily basis.

Eighty six percent of subjects (N=74) who never went to school, and 63.4% of those with primary education hardly ever or never participated in physical activity. Similarly, over 46% with secondary education hardly ever or never participated in physical activity. However, all the subjects with tertiary education took part in physical activity or exercise on a daily basis.

Over 76% of the participants who were unemployed, and 70% of those who were dependent hardly ever or never participated in physical activity compared to 55.8% of those who were actively employed. Furthermore, 26.9% of those who were actively employed participated in physical activity on a daily basis, compared to only 5.5% of those who were unemployed.

In order to carry out significance tests using the χ^2 test, the observed frequency cells were collapsed to increase the frequency of expected values to a value more than 5. In addition, small or no values like retired or dependent were categorised together. There was no significant difference in frequency of participation in physical activity between males and females ($p=0.275$), whereas the difference in frequency of participation was significant for education and employment status ($p =0.000$, in each case).

Table 4.4: Frequency of physical activity participation in relation to gender, education and duty status (n=334)

	<i>Everyday</i>		<i>3 times a week</i>		<i>Once a week</i>		<i>Hardly ever or never</i>	
	<i>N</i>	<i>(%)</i>	<i>N</i>	<i>(%)</i>	<i>N</i>	<i>(%)</i>	<i>N</i>	<i>(%)</i>
<i>Gender</i>								
Male	37	(13.7)	29	(10.8)	23	(8.6)	178	(66.7)
Female	13	(19.4)	12	(17.9)	4	(6)	38	(56.7)
<i>Education</i>								
Never went to school	2	(2.3)	6	(6.9)	4	(4.6)	74	(86)
Primary 1-6	30	(18.3)	24	(14.6)	6	(3.7)	104	(63.4)
Secondary 1-3	12	(19.3)	9	(14.5)	17	(27.4)	24	(38.7)
Secondary 4-6	2	(10)	2	(10)	2	(10)	14	(70)
Tertiary level	2	(100)	-	-	-	-	-	-
<i>Employment status</i>								
Active duty	28	(26.9)	16	(15.4)	2	(1.9)	58	(55.8)
Dependent	4	(20)	2	(10)	-	-	14	(70)
Retired	-	-	-	-	-	-	2	(100)
Unemployed	8	(5.5)	16	(10.9)	10	(6.8)	112	(76.7)
Others	14	(22.6)	4	(6.5)	14	(22.6)	30	(48.4)

4.3.1.3 *Physical activity and level of amputation, type and condition of ambulatory devices*

Table 4.5 illustrates the frequency of participation in physical activity in relation to level of amputation, type and condition of ambulatory devices. For individuals with unilateral amputation, the majority who hardly ever or never participated in physical activity were above-knee amputees (70%) compared to below-knee (58.1%) amputees. Due to the great variation in low response rate by individuals with bilateral amputations (10.2%)

versus their counterparts (89.8%), valid conclusions regarding greater participation in physical activity appeared difficult. However, it was evident that 75% of those with bilateral above and below-knee amputation hardly ever or never participated in exercise, while all individuals with bilateral below-knee amputation hardly ever or never participated in exercise. In addition, approximately 65% of all subjects with bilateral amputations hardly ever or never participated in physical activity.

With regard to type of ambulatory device, the majority who did not have prostheses, and either had axillary crutches (89.3%) or elbow crutches (74.7%) hardly ever or never participated in physical activity. The corresponding percentage of participation in physical activity on a daily basis, for those who either had axillary crutches (7.1%) or elbow crutches (6.9%), was comparatively much smaller. Greater participation in physical activity for those with prostheses seemed to be noticeable, considering the fact that, 21.3% of those who had definitive prostheses, and 17.6% of those who had provisional prostheses participated in physical activity on a daily basis.

Concerning the condition of ambulatory devices, there appeared to be small variations in physical activity participation on a daily basis, between those who reported their ambulatory devices to be in a good and functional condition (16.2%), and those who reported their devices to be in a very a poor condition (9.1%). Again, there was a minimal difference in the percentage of those who hardly ever or never participated in physical activity, and either reported their ambulatory devices to be in a good and functional condition (57.3%), or in a very a poor condition (75%). Conclusively, the type of ambulatory devices appeared to significantly influence physical activity participation using

the χ^2 -test ($p=0.000$), whereas there was no significant difference in physical activity participation between possession and condition of ambulatory devices ($p> 0.05$).

Table 4.5: Physical activity participation in relation to disability-related variables (n=334)

	<i>Everyday</i>		<i>3 times a week</i>		<i>Once a week</i>		<i>Hardly ever or never</i>	
	<i>N</i>	<i>(%)</i>	<i>N</i>	<i>(%)</i>	<i>N</i>	<i>(%)</i>	<i>N</i>	<i>(%)</i>
<i>Level of amputation</i>								
Toe or partial foot	2	(14.3)	2	(14.3)	-	-	10	(71.4)
Unilateral below-knee	26	(19.1)	21	(15.4)	10	(7.4)	79	(58.1)
Unilateral above-knee	10	(7.5)	16	(11.9)	12	(8.9)	96	(70)
Knee disarticulation	4	(25)	2	(12.5)	-	-	10	(62.5)
Bilateral below-knee	-	-	-	-	-	-	4	100
Bilateral above/ below knee	2	(12.5)	2	(12.5)	-	-	12	(75)
Bilateral above knee	4	(28.6)	-	-	3	(21.4)	5	(35.7)
<i>Type of ambulatory devices</i>¹								
Provisional prostheses	6	(17.6)	8	(23.5)	-	-	20	(58.8)
Definitive prostheses	20	(21.3)	7	(7.4)	14	(14.9)	53	(56.4)
Wheelchairs	2	(9.1)	1	(4.5)	3	(13.6)	16	(72.7)
Pylons	4	(22.2)	2	(11.1)	-	-	12	(66.7)
Axillary crutches	4	(7.1)	-	-	2	(3.6)	50	(89.3)
Elbow crutches	6	(6.9)	10	(11.5)	6	(6.9)	65	(74.7)
<i>Condition of the devices</i>¹								
Good and functional	11	(16.2)	10	(14.7)	8	(11.8)	39	(57.3)
Repairable condition	13	(11.9)	12	(11)	8	(7.3)	76	(61.5)
Very poor condition	12	(9.1)	11	(8.3)	10	(7.6)	99	(75)
Others	-	-	-	-	-	-	2	(100)

¹N= 311

4.3.1.4 *Barriers to participation in physical activity or exercise*

Table 4.6 shows various barriers to participation in physical activity among those who hardly ever or never participated in physical activity or exercise. The greatest barrier to participation in physical activity, reported by 31.5% (N=68) of the participants was lack of knowledge of where to exercise. From the qualitative findings, there was further emphasis to this factor, as one of the participants explained,

A6: *I do not know if there are places around for us to do the exercises. Other people [the non-disabled] do the exercises in those places. Maybe it would be good to do the exercises with others. I mean one would try to do it more or less like others. I really do not know where others like us do the exercises. It is difficult when it comes to running up and down the stairs with those who are well, how can one compete?"*

Table 4.6: Barriers to participation in physical activity or exercise (n=216)

<i>Barriers to do physical activity or exercise</i>	<i>Number</i>	<i>%</i>
Do not know where to exercise	68	31.5
Lack of motivation	48	22.2
Lack of energy, not sure if I can manage	35	16.2
Cost of transport or ambulatory devices	34	15.7
Have other concerns, like frustration or depression	18	8.3
Other reasons: lack of time, lack of facilities or interest	13	6

The second highest factor, reported by 22.2% (N=48) of the participants, was lacking motivation to participate in physical activity. From the qualitative interviews, participants

gave more clarification regarding lack of encouragement to start exercising, as one of them explained,

A4: *I do not do any physical activity, not because there are no facilities, but I have never thought about it. Where would I start? The other time when I went to Nyamirambo [stadium] on the day for the disabled, I saw what the boys were doing, those boys from Gatenga [Centre for training acrobats], I felt moved. I am sure I can also manage those manoeuvres, but I have never thought about those exercises. In a fact, no one has ever encouraged me to start the exercises.*

The influence of this factor was further echoed in the following statements, as one participant said,

A3: *For me if I could get someone to enlighten me about the exercises. Personally, I lack someone to motivate me, you know. I used to do some jogging when I was young, and felt very strong and healthy. Now I would do something else, weight lifting.... [Pauses]... and. ...other activities.*

Lack of energy to participate in physical activity or exercises was reported by 35 (16.2%) participants. Furthermore, the following is a quotation from the qualitative interviews expressing one of the participant's views regarding this factor:

A15: *I can't manage those exercise; you see one should eat well, eat a good diet in order to manage all that. Even when I used to go for prosthetic training, I would feel very exhausted after the exercises. You know most of us are not financially well off [Pauses] I do not know if I can go to do the exercises and manage.*

In addition, participants were not sure if they could manage to exercise safely. Lack of knowledge of how to exercise safely prevented participants from engaging in physical activity or exercise. One of the participants explained,

A9: *With exercises, it is fine but sometimes you have to think ahead, you lift those metals, or do some jogging up the hill and down in the valley. Yes, suppose you are injured, where can you get the funds for treatment? Things are difficult, you know. I mean I would try to do the exercises, but see how I am, how do I know how to do it?*

Other barriers included a lack of either transport costs or ambulatory devices or both, reported by 15.7% (N=34) of participants. Lack of facilities and lack of interest (N=13, 6%) were some of the other barriers participants indicated. Participants noted that nobody advised them to participate in physical activity after prosthetic fitting and rehabilitation. Some participants indicated a lack of time for participation in physical activity. One of them explained,

A12: *I would say I do not do any physical activity. Where would I get the time my friend?... [pauses] ... with [laughs], my family expects me to work.... earn a living and make my family comfortable...*

In addition, during interviews, some participants complained of lack of facilities. In the following citation, one participant wondered if there were facilities for them to do the exercises. He explained,

A6: *You see one cannot go to the hospital gyms like here [hospital where the interviews were carried out] when you do not have any injury...[pauses]. I mean when you do not have any other problem. I doubt if there are facilities for us to do the exercises.*

4.3.2 Use of tobacco, drugs, alcohol and influencing factors

Table 4.7 illustrates the participants' frequency of substance usage. One hundred and twelve (33.5%) participants used tobacco substances, cigarettes, local tobacco or chewed tobacco. Out of 112 participants (33.5%) who smoked or used tobacco substances, the majority (N=44, 39.3%) smoked 11-20 cigarettes or rolls² of local tobacco everyday, followed by 38 (33.9%) who smoked 6-10 cigarettes or rolls of local tobacco everyday.

Of the 202 (60.5%) participants who consumed alcohol, the majority consumed alcohol 3-4 times a week (N=80, 39.6%), followed by 56 (27.7%) who used alcohol once a week. Concerning the use of drugs, 32 (9.6%) participants used drug substances including opium, marijuana or cocaine.

²In Rwanda, a piece of tobacco is rolled to form a shape similar to the ordinary cigarettes by using a small piece of tobacco leaf to wrap it up. In local dialect, this is called 'GUSUGUTA'. In this study, such rolls of tobacco are comparable to cigarettes.

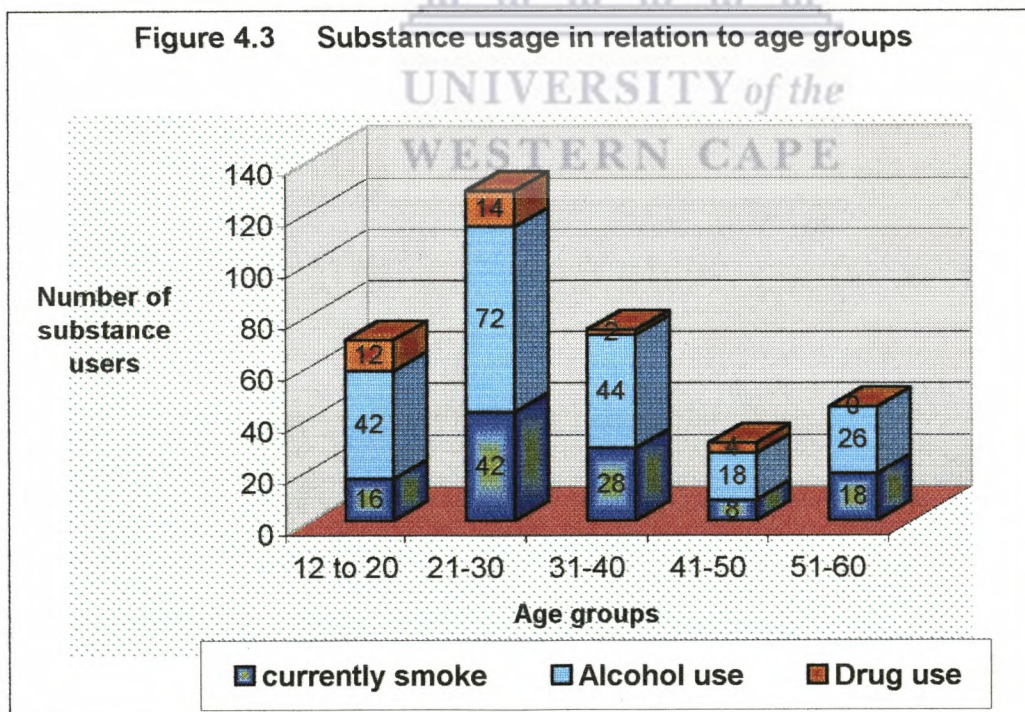
Table 4.7: Substance usage

<i>Substance usage</i>	<i>Yes</i>		<i>No</i>	
	<i>N</i>	<i>(%)</i>	<i>N</i>	<i>(%)</i>
<i>Currently smoke or use any tobacco</i>	112	(33.5)	222	(66.5)
1-5 cigarettes a day	30	(26.8)		
6-10 cigarettes a day	38	(33.9)		
11-20 cigarettes a day	44	(39.3)		
<i>Alcohol use</i>	202	(60.5)	132	(39.5)
Everyday	48	(23.8)		
3-4 times a week	80	(39.6)		
Once a week	56	(27.7)		
A few times a month	18	(8.9)		
<i>Use of drugs</i>	32	(9.6)	302	(90.4)



4.3.2.1 Substance usage in relation to age groups

Figure 4.3 illustrates the number of participants in each age group in relation to substance usage. The majority of the participants who used drugs (N=14, 43.8%) were in the age group 21-30 years, followed by those in the age group 12-20 (N=12, 37.5%) years. For tobacco smoking, the majority (N=42, 37.5%) were also in the age group 21-30 years, followed by 28 (25%) participants in the age group 31-40 years. The smallest number of tobacco users (N=8, 7.1%) were in the age group 41-50 years. With regard to consumption of alcohol, the majority (N=72, 35.6%) were in the age group 21-30 years, followed by 44 (21.8%) in the age group 31-40 years, while the smallest number of participants (N=18, 8.9%) were in the age group 41-50 years.



4.3.2.2 *Frequency of substance usage and age groups*

Table 4. 8 illustrate the participants' frequency of substance usage in relation to age groups. Of the 44 (39.2%) participants who smoked 11 to 20 cigarettes or rolls of local tobacco daily, the majority were in the age groups 12-30 years. The smallest number of tobacco smokers (N=4, 3.6%) were in the age group 51-60 years.

The majority of alcohol consumers (N=28, 13.9%) used alcohol 3-4 times a week and were in the age group 21-30 years, followed by 20 (9.9%) participants in the same age group. A similar number (N=20, 9.9%) in the age group of 31-40 also consumed alcohol 3-4 times a week. The smallest number of alcohol users (N=2, 0.9%) were in the age group 41-50 years, followed by 6 (3%) in the same age group.

Chi-square tests indicated a significant association between substance usage including alcohol consumption ($p=0.004$) and tobacco use ($p=0.001$) in relation to age groups. Tests of independence could not be carried out between the use of drugs and age groups due to the smallness of cell sizes, as well as some missing figures.

Table 4. 8: Frequency of substance usage in relation to age groups.

<i>Age groups</i>	12-20	21-30	31-40	41-50	51-60	<i>Total</i>
	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>
<i>Currently smoke</i>	16 (14.3)	42(37.5)	28 (25)	8 (7.1)	18(16.1)	112 (33.5)
1-5 cigarettes/ day	6 (5.4)	8 (7.1)	10 (8.9)	2 (1.8)	4 (3.6)	30 (26.8)
6-10 cigarettes / day	14 (12.5)	8 (7.1)	6 (5.4)	6 (5.4)	4 (3.6)	38 (34)
11-20 cigarettes/day	12 (10.7)	12 (10.7)	10 (8.9)	6 (5.4)	4 (3.6)	44 (39.2)
<i>Alcohol use</i>	42(20.8)	72 (35.6)	44(21.8)	18 (8.9)	26(12.9)	202 (60.5)
Everyday	12 (5.9)	18 (8.9)	8 (4)	2 (0.9)	8 (4)	48 (23.7)
3-4 times a week	14 (6.9)	28 (13.9)	20 (9.9)	10 (4.9)	8 (4)	80 (39.6)
Once a week	10 (4.9)	20 (9.9)	10 (4.9)	6 (3)	10 (4.9)	56 (27.7)
A few times a month	7 (3.5)	6 (3)	5 (2.4)	-	-	18 (8.9)
<i>Use of drugs</i>	12(37.5)	14 (43.8)	2 (6.2)	4 (12.5)	-	32 (9.6)

4.3.2.3 Substance usage in relation to gender and education

Table 4.9 shows the figures for substance users in relation to gender and level of education. Ninety-eight (87.5%) males used tobacco substances, compared to 14 (12.5%) females. One hundred and seventy eight (88%) males consumed alcohol, compared to 24 (12%) females. Thirty (93.7%) males used drug substances, while only 2 (6.3%) females used drugs.

The majority of the participants (N=44, 39.3%) who had never gone to school used tobacco substances, and an equal number of those who had attained primary education used tobacco substances. The majority of those who consumed alcohol (N=96, 47.5%) had attained primary school, followed by 56 (27.7%) who had never

gone to school. The highest number of drug users (N=24, 75%) had attained primary school.

Using the χ^2 -test, there was a significant difference between education and the use of tobacco substances ($p = 0.001$), and the use of drugs ($p = 0.006$). However, alcohol consumption was independent of education ($p > 0.05$).

Table 4.9: Substance usage in relation to gender and education

	Gender		Education			
	Male	Female	Never	Prim ¹	Sec 1-3 ²	Sec 3-6 ³
Currently smoke	98	14	44	44	20	4
1-5 cigarettes / day	26	4	10	14	6	-
6-10 cigarettes/ day	64	2	16	34	14	2
11-20 cigarettes/ day	28	10	18	12	6	2
Alcohol consumption	178	24	56	96	40	10
Everyday	40	8	16	26	6	-
3-4 times a week	72	8	18	42	16	4
Once a week	42	14	18	24	10	4
A few times a month	22	-	4	8	8	2
Use of drugs	30	2	2	24	6	-

Key to the table: ¹Primary, ²Secondary 1 to 3, ³Secondary 4 to 6

4.3.2.4 Substance usage in relation to duty status

Table 4.10 presents the number of substance users in relation to employment status. Surprisingly, most participants (N=54, 48.2%) who used tobacco substances were unemployed, followed by 34 (30.4%) who were employed. The majority of participants

who smoked 6-10 cigarettes or rolls of local tobacco were also unemployed (N=30), followed by those in active employment who smoked 6-10 cigarettes or rolls of tobacco daily. The smallest number of tobacco users (N=2, 1.8%) had retired.

Most participants who consumed alcohol (N=92, 45.5%) were unemployed, followed by those who were involved in active duty (N=64, 31.7%). Most drugs users (N=16, 50%) were unemployed while the second highest drug users were also involved in active duty (N=12, 37.75).

Table 4.10: Substance usage in relation to employment status.

<i>Employment status</i>	<i>Actively employed</i>	<i>Dependent</i>	<i>Retired</i>	<i>Unemployed</i>	<i>Others</i>
<i>Currently smoke</i>	34 (30.4%)	18 (16.1%)	2 (1.8%)	54 (48.2%)	4 (3.5%)
1-5 cigarettes a day	8	6	2	14	-
6-10 cigarettes /day	20	8	-	30	8
11-20 cigarettes/day	16	4	-	16	2
<i>Alcohol consumption</i>	64 (31.7%)	14 (6.9%)	2 (1%)	92 (45.5%)	30 (14.9%)
Everyday	14	-	-	28	6
3-4 times a week	36	-	-	30	14
Once a week	16	6	2	26	6
A few times/ month	-	8	-	8	6
<i>Use of drugs</i>	12 (37.5%)	-	-	16 (50%)	4 (12.5%)

4.3.2.5 *Substance usage in relation to level of amputation*

Table 4.11 illustrates participants' substance usage in relation to level of amputation. The majority of tobacco users were unilateral above-knee amputees (N=50, 44.6%), followed by unilateral below-knee amputees (N=38, 34%). An equal number of bilateral below-knee and bilateral above-knee amputees (N=2, 1.8%) used tobacco substances.

A high percentage (46.5%, N=94) of unilateral below-knee amputees consumed alcoholic, followed by 33.8% (N=68) unilateral above-knee amputees. The smallest number (N=2, 1%) of participants who consumed alcohol were bilateral above-knee and below-knee amputees, followed by 4 (2%) bilateral above-knee amputees.



Table 4.11: Substance usage in relation to level of amputation

	<i>Level of Amputation</i>						
	Toe & foot	Uni B/K	Uni A/K	Knee disart.	Bil B/K	Bil A/K & B/K	Bil A/K
Currently smoke	8 (7.1)	38 (34)	50 (44.6)	4 (3.6)	2 (1.8)	8 (7.1)	2 (1.8)
1-5 cigarettes/day	-	10	16	2	-	2	-
6-10 cigarettes/day	-	28	34	-	-	2	2
11-20 cigarettes/day	8	14	8	2	2	4	-
Alcohol Use	12 (5.9)	94(46.5)	68 (33.8)	12(5.9)	2 (1)	10(4.9)	4 (2)
Everyday	2	26	14	2	-	4	-
3-4 times a week	2	36	28	6	2	4	2
Once a week	6	26	20	4	-	-	-
A few times/month	2	8	10	-	-	2	-
Use of drugs	-	16 (50)	12 (37.4)	2 (6.3)	-	2 (6.3)	-

Key to the Table

Uni B/K = Unilateral below knee amputees

Uni A/K = Unilateral above knee amputees

Knee disart. = Knee disarticulation amputees

Bil B/K= Bilateral below knee amputees

Bil A/K & B/K = Bilateral above and below knee amputees

Bil A/K= Bilateral above knee amputees

In addition to quantitative results on substance usage, in-depth interviews revealed some reasons why participants were involved in various use of substances including drug abuse, tobacco use and alcohol consumption. One participant explained,

A6: *I wouldn't like to take drugs, smoke or even drink alcohol, but my friend, if you were in my place, you would find yourself doing all this too. To me, life has changed. When I lost the first leg, at least, but now things are not easy. I feel low in society...[shakes head] inferior to others, and have to accept any job. Certainly life plans have changed, some how I try to swallow it but...[stops]...*

Another participant further explained,

A5: *Drugs, they are fine, you get self-satisfaction, get contented with the little you have. It has many effects, but for me, it is fine.*

During in-depth interviews, it was clear that some participants got involved in drug abuse before amputation. However, the presence of the disability appeared to have exacerbated the participants' risky behaviour to indulge in more drug abuse, an aspect that would need serious attention to reverse. One participant commented,

A2: *I started to take drugs nine years ago before I lost a leg. When I lost my leg, I found myself taking more of it [drugs]. More because when I am in low spirits, may be depressed, and I take it, I feel delighted and tend to forget lots of troubles.*

Other participants expressed issues related to depression as some of the reasons why they were involved in substance abuse. In the following qualitative interview extract, one participant articulated this concern as,

A4: *I take a bit [refers to drugs] and tend not to think a lot about my problems. I am not a professional, have no job, yet I have to do this and that to survive, and my family off course. I should say it is much more difficult now to manage all this. It*

is very disheartening, but when I smoke, I get a settled mind. I used to have sleep problems, now I puff one or two and go to bed.

More emphasis and thorough explanations as to why participants were involved in tobacco use were described. One participant noted,

A13: *By the way I feel some relaxation when I smoke. I usually feel bad, alone, with all the problems. Obviously, when I started to smoke before I lost a leg, I would feel somehow proud to smoke one or two among my friends. Now I do it for many reasons... frustration, you see I used to do a lot of heavy physical work, now that is gone. I mean you cannot compete with those boys who run around everywhere [refers to age mates working in town].*

One participant who stopped drug abuse explained how relatives and friends encouraged him to stop. This probably emphasizes the need to access relevant information through social support as some of the issues that need to be targeted in health promotion interventions. He explained,

A10: *My brother used to deal in it [drug] when I was young. Therefore, I picked it up from him. Now I have stopped. Slowly as time went by, my relatives and some friends advised me to stop it [use of drugs]. Now I have found more peace and time to reflect on my life. I need time as an amputee to think about my life, even more than others [the non-disabled]. I used to fail to get time to think about my life, issues regarding my well-being.*

Among the issues that need to be targeted, support groups among people with LLA appeared to be a potential source of appropriate behaviours through sharing

experiences. One participant who stopped using drugs explained how he managed, and was ready to share this information with others. He said,

A3: *It is not always true. I used drugs for three years; it became a routine, part of me. I was colonised, couldn't think much, could not know when to eat, or sleep,...or differentiate between day and night. Yes, true we meet several challenges, but its better to face them in a practical way. I would advise people to leave taking those things [all drugs in general], and be themselves. I know it is difficult, but I can discuss how to do it with whoever wants to stop it.*

Similarly, another participant who stopped the use of drugs and alcohol substances encouraged others to stop it in this statement:

A12: *With alcohol, or the strong thing [refers to drugs] you do not over think about impossible things. You get settled, joyful, and no extreme thinking, no depression- one becomes peaceful in mind...But I stopped all this because it is bad. One does get time to think about a number of issues. I would think others should stop it too.*

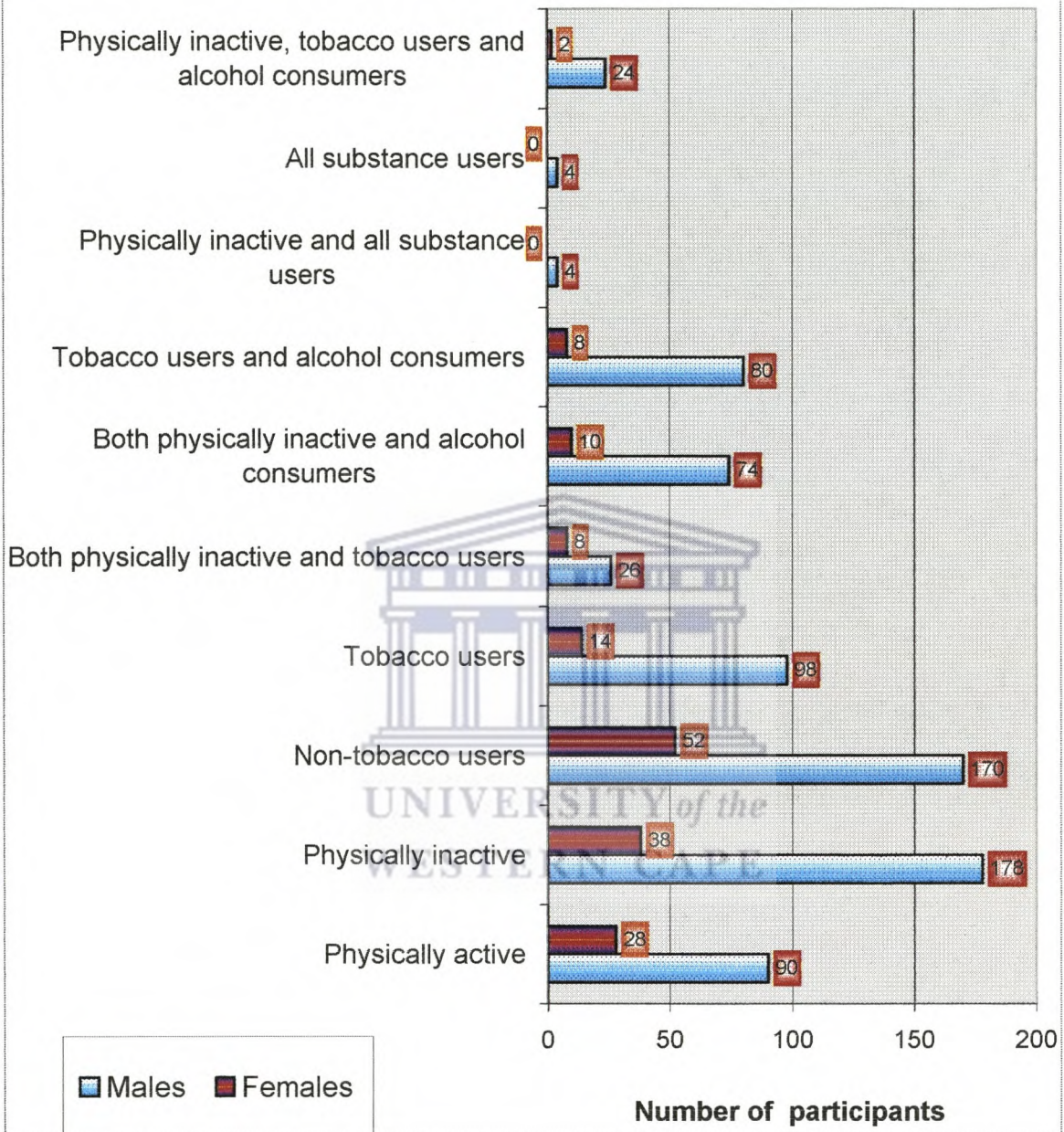
4.4 PHYSICALLY ACTIVE PARTICIPANTS, SUBSTANCE USERS AND THEIR COUNTERPARTS

A number of participants were involved in all health-risk behaviours assessed in this study. Figure 4.4 illustrates the number of physically active participants, substance users and their counterparts in relation to gender. Most participants who combined at least two health-risk behaviours were 88 tobacco users and alcohol consumers (80 males and 8 females). The second highest number were 84 physically inactive participants and alcohol consumers (74 males and 10 females), while 34 were both

physically inactive participants and tobacco users (26 males and 8 females). Twenty-six participants combined physical inactivity, tobacco use and alcohol consumption (24 males and 2 females). Four participants, who were physically inactive and substance users, were males.



Figure 4.4 Physically active participants, substance users and their counterparts



4.5 PREDICTION OF PARTICIPANTS HEALTH-RELATED BEHAVIOURS

Using demographic factors, an attempt was made to build a model to predict participants' involvement in physical activity, use of tobacco, drug abuse or alcohol

consumption. Using Multiple Logistic Regression for Categorical Variables, participants' health-related behaviours can be predicted using the following equation:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3$$

Table 4.12 presents the values of each significant variable, constant β_0 , p-values and their correct class percentage (%).

Table 4.12: Values for significant variables used to predict participants' behaviours

Behaviours	Constant Value (β_0)	$\beta_1 x_1$	$\beta_2 x_2$	$\beta_3 x_3$	Correct % estimate of the Model
Physical activity	7.453*	-0.042 (Age)			70.6%
	7.523*		-5.640 [Educ (2)]		68.2%
Use of tobacco	7.754*	-0.948 [Gend(2)]			70.3%
	7.620¶		-1.364 [Amput (5)]		69.7%
	7.842 [∅]			-4.362 [Educ (1)]	67.3%
Drug abuse	1.127*	0.130 (Age)			90.4%
	1.237*		0.050 [Gend (1)]		90.4%
Alcohol consumption	4.060 [∅]	1.809 [Amput (4)]			68.5%
	3.960*		1.253 [Gend (1)]		66.1%

*p-values=0.000

[∅] p-values=0.001

¶ p-value=0.008

Amput: Amputation

Educ: Education

Gend: Gender

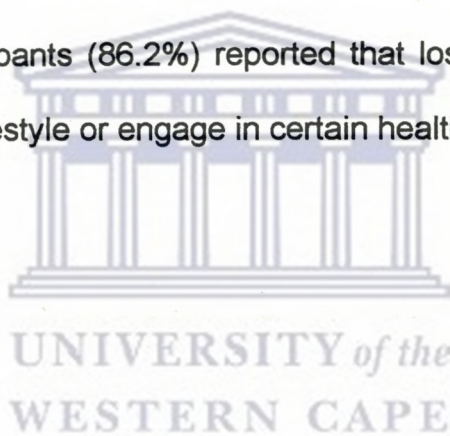
In conclusion, however, the building of an improved model would need a greater sample size. Secondly, the model would need to be validated using a larger sample.

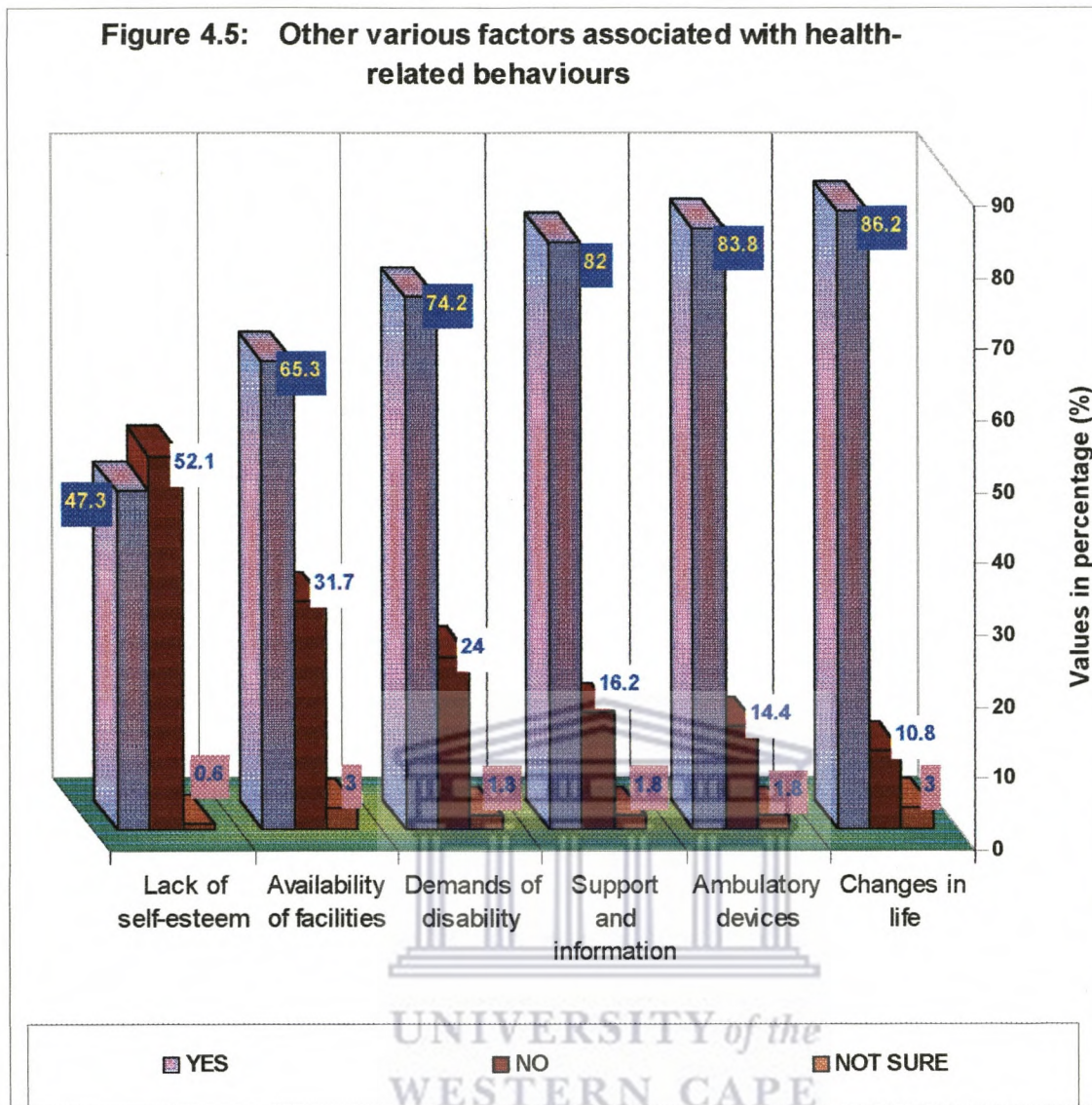
4.6 OTHER FACTORS ASSOCIATED WITH HEALTH-RELATED BEHAVIOURS

Other factors that influenced participants' health-related behaviours were assessed both qualitatively and quantitatively. In the quantitative sample of the study, the following are some of the factors that influenced participants' health-related behaviours.

4.6.1 Various influences on health-related behaviours

Figure 4.5 illustrates the participants' responses regarding various factors that influenced participants' choices to engage in certain health-related behaviours. The highest number of participants (86.2%) reported that loss of a limb influenced their choice to accept a new lifestyle or engage in certain health-related behaviours.





Possession of ambulatory devices such as wheelchairs, prostheses and crutches, influenced participants' involvement in physical activity or exercise. This influence was reported by 83.8% of the participants. The following extract from qualitative interviews explains further the impact of a lack of ambulatory devices, as one informant indicated,

A1: *It is difficult for me to work without this metal [refers to the prosthesis]. Last week it broke, and I couldn't go anywhere. You see it is old, and I wonder if I will get the money to buy another. You know those things [participation in exercise] need someone who has the means.*

The role of information support resources from friends, family members and health care professionals was reported by 82% of the subjects. Participants explained that their choices to engage in some health-related behaviours were often influenced by information support from various people.

Another influence reported by 74.2% (N=248) was the demands of the disability, like being unable to do things with/ for the spouse and children or a conflict over the amount and quality of work, which influenced their lifestyle behaviours. This resulted in frustration, depression, and thus unhealthy lifestyle behaviours.

A good number of participants (65.3%) also reported that facilities such as availability of appropriate playgrounds, availability of exercise equipment and other facilities influenced their lack of participation in physical activity or exercise.

The least reported factor in the quantitative results was lack of self-esteem, guilt of burdening others, frustration, depression or irritability, which influenced participants' choice to use drugs, tobacco or alcohol. This was reported by 47.3% (N=158) of the participants.

4.6.2 Factors related to professional and social information support

Figure 4.5 illustrates the respective percentages of the participants who received and sought professional and social support. Most participants (N=144, 43%) received and sought information support about the care of the stump. An equal number (N=144, 43%) of participants received and sought information support about stress management techniques. The smallest number of participants (N=108, 32%) received and sought information support about participation in physical activity. The majority of participants lacked information on a number of issues, as one of them explained,

A5: *No body tells us about these things. The other day when I went to the clinic, by chance, the health worker was talking about HIV/AIDS prevention and awareness. I stopped and listened. You have to find out yourself, even with physical activity, exercises, I try to do some weight lifting, but ... it is difficult alone. Possibly we need to do it together, we could all get involved. So nobody really talks about it, I used to do it when I was still at Kanombe [a rehabilitation centre].*

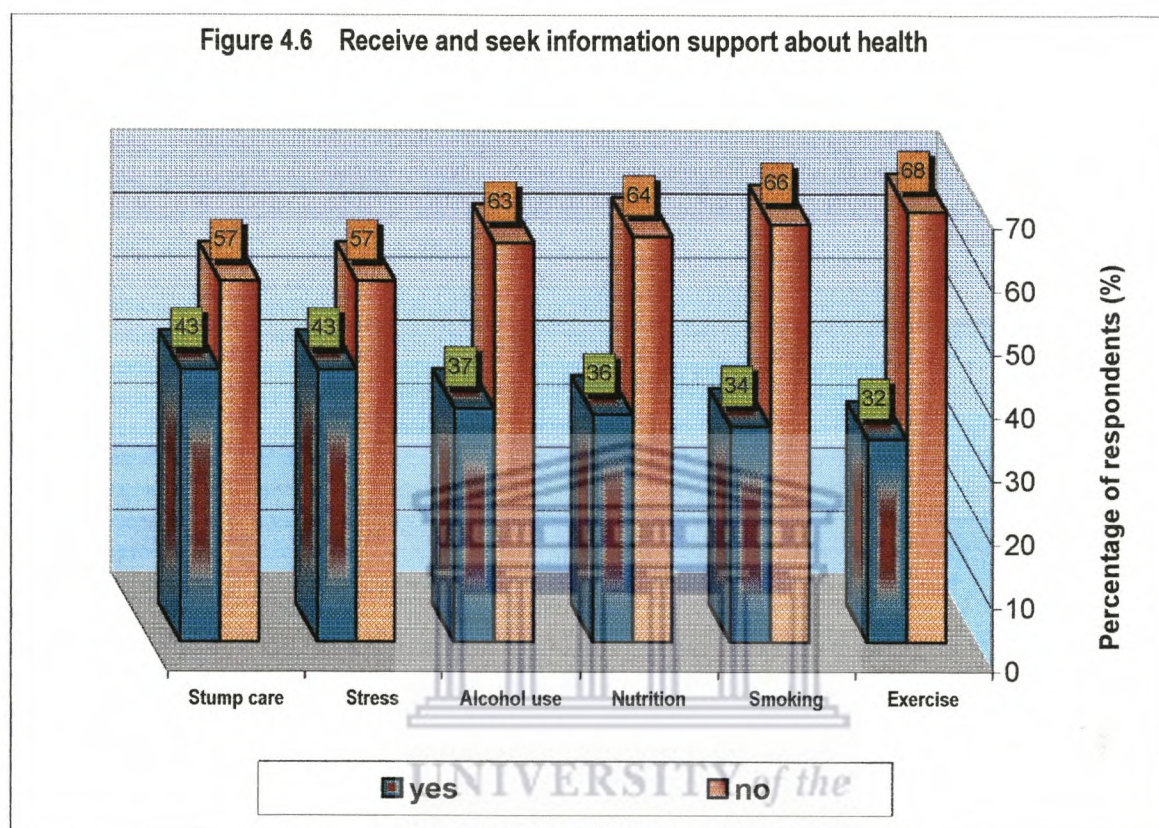
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Furthermore, another participant explained how information on health-related issues to improve their well-being could be channelled,

A1: *...You can teach us also other good things [behaviours]. You can possibly do it through the Friday radio teachings on health issues. You can also gather us on certain occasions, like how you have done it.*

With regard to sources of support, most participants (N=143, 42.8%) received and sought information support from health care professionals, followed by support from

parents and relatives (N=127, 38%). A small number received and sought information support from spouses (N=13, 3.9%). The rest received and sought information support from other people such as friends and various religious leaders (N=51, 15.3%).



4.6.1 Peer influence on participants' choice to engage in health-related behaviours

Peers influenced participants' choice to engage in various health-related behaviours. To determine peer influence on participants' involvement in a number of health-related behaviours, Pearson's correlation coefficient was employed. There were positive, though weak correlations for the use of tobacco and alcohol consumption. For tobacco or cigarettes smoking, $r=0.18$, while for alcohol consumption, $r=0.2$. In all these cases,

the association was significant for both alcohol consumption ($p=0.000$) and the use of tobacco substances ($p=0.001$).

4.6.2 Participants' psycho-social well-being and self-perception

Table 4.13 describes the frame of mind of the participants at the time of the survey. One hundred participants (29.9%) reported that they led a happy lives, 192 (57.5%) reported that they had 2 or more evenings out a week, and 108 (32.3%) reported that they felt very low in society. Sixty-two (18.6%) felt that they were isolated, while 82 (24.6%) felt that they were lonely. However, 301 participants (90.1%) reported that they had one or more friends, and 268 (80.2%) reported self-confidence.

Table 4.13: Participants' psycho-social status and self-perception

<i>Psycho-social and self-perception</i>	Yes		No	
	N	(%)	N	(%)
Do you have friends (one or more)?	301	90.1	33	9.9
Do you have self-confidence?	268	80.2	66	19.8
Do you have happiness in life?	234	70.1	100	29.9
Do you have 2 or more evenings out a week?	142	42.5	192	57.5
Do you feel isolated?	62	18.6	272	81.4
Do you feel lonely?	82	24.6	252	75.4
Do you feel very low in society?	108	32.3	226	67.7

4.7 PARTICIPANTS' PERCEIVED HEALTH-RELATED NEEDS

Figure 4.7 (page 105) illustrates the perceived health-related needs of the participants in their responses to various health-related programmes and activities. The majority (N=322, 96.4%) of participants desired to attend teachings about HIV and AIDS awareness and prevention, followed by 318 (95.2%) who desired to attend new lifestyle habits to improve their health. The third highest number (N=316, 94.6%) of participants desired to attend health risk screening programmes. Amazingly, the smallest number of participants (N=268, 80.2%) desired to attend teachings about weight management tips, and the second smallest number (N= 276, 80.6%) desired to attend teachings about why smoking is deadly.

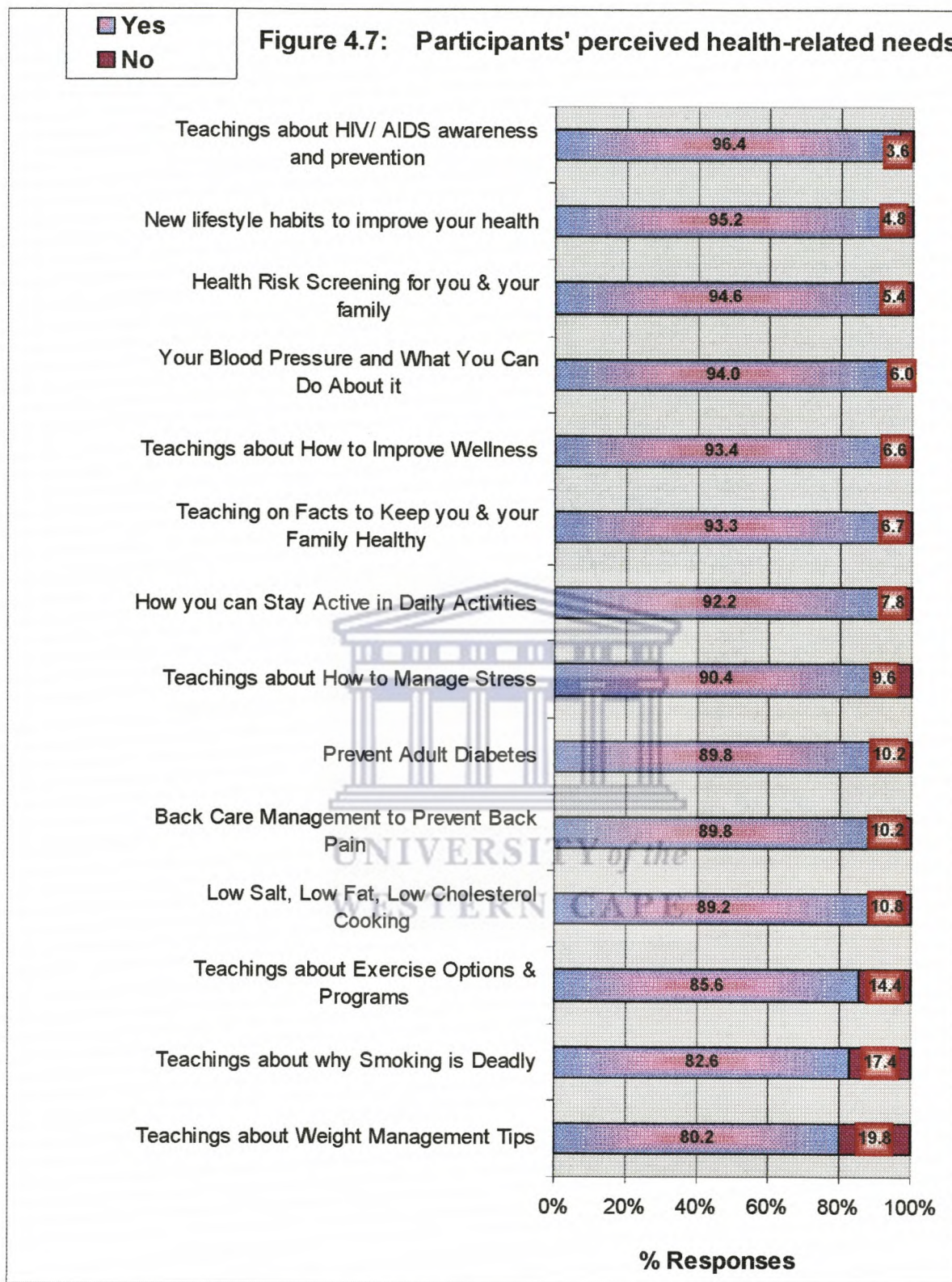
During in-depth interviews, participants clarified and gave more meaning regarding the desire to get relevant information from health care professionals. One of the participants said,

A1: *I think you [health professionals] can teach us how to live a good life. For us who smoke, I am certain you can teach us ways to quit smoking or decrease the rate of smoking. You can teach us also other good things [behaviours]. For instance, some therapists at the orthopaedic workshop were telling me to stop drinking since I could fall down.*

With regard to other health-related needs and programs, which the participants perceived as essential, participants presented several views. Most participants desired vocational training such as carpentry, motor mechanics or computer knowledge. One of the participants expressed such views in the qualitative interviews as,

- A3 *I would think there are many things to do for us, the disabled- we need to earn a better living. Most of us do not work. When I was injured, I was hospitalised for two months, I then left school immediately after the war, and that was all. I am sure something like vocational training can help example carpentry, motor mechanics, welding and so on. We would even be better organised together, say in one place, to share views and experiences, and to do several activities ourselves, like exercises, and so on...*





In addition, a good number of participants desired to learn how to manage projects and businesses. Other participants desired to learn how to make prostheses and

orthoses. Most participants also expressed the desire to be given disability funds. One participant explained,

A9: *I am sure the government can do something for us, even to come and talk to us like this, and know how we live and what our views are about such things. Maybe they can arrange to give something to us to make ends meet, say every month ...[pauses] I do not know, but something to help us [a monthly disability fund]. I am sure we would even be able to do those exercises.*

Furthermore, one of the participants expressed the opinion that health authorities needed to obtain up to date information about people with physical disabilities in order to provide desired services. He commented,

A12: *I do not think that the authorities, or you professionals know how many we are or even know where we live in our Provinces, Districts and 'secteurs' [villages]. How can training start when the authorities do not know how many we are and where we live? To know this is vital so that all that can be planned. For instance, how many vocational training schools would be set up? There is a need to know our numbers, where we live, and that need to be done first. You the professionals and health authorities should even first avail affordable medical facilities to our families and us.*

5.1 INTRODUCTION

This chapter focuses on a comparison of the current study's findings with similar studies. A number of health promotion needs are discussed in relation to similar studies. The impact of the findings on disability, the impact of involvement in health-risk behaviours and the impact on health service provision are also discussed. Furthermore, attention is given to how amelioration of the impact of the findings to Rwanda can be done. Finally, a number of limitations of the study are discussed.

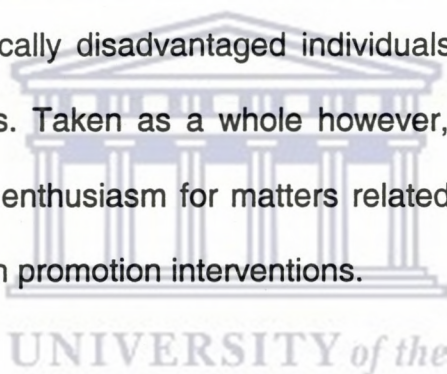
5.2 CONFORMITY TO PARTICIPATION IN THE STUDY

The response rate of 86.5% in the study is one of the highest, and is much higher than the generally accepted response rate of 65% (Kersten *et al.*, 2000). This reflects the participants' enthusiasm to narrate issues that concern their lives to anyone. The zeal was much more vivid in one of the participants' views in the qualitative interviews, who said,

"...You see we should be able to talk freely, speak the truth. Here, [meaning in Rwanda] no body values a disabled person. I do not know even why you came to us to discuss these issues with us. For me I appreciate to be involved in the study for whatever reasons. There are many people like us out there indoors all the time. You see these landmines brought many problems, I really know some

people who lost both legs, and are at home all the time. How do they come here?"

This interest has been evident in other studies of people with different disabilities (Spruill, 1999). Furthermore, in a recent study on the employment status of lower limb amputees, Schoppen *et al.*, (2001) indicated a similar high compliance. Despite a high compliance, a response bias cannot be completely ruled out. The participants could have been individuals from high socio-economic strata who could afford the time and means to participate. Alternatively, since it appears that it was rare for anyone to discuss with the participants issues related to their well-being, the respondents could have been socio-economically disadvantaged individuals who wanted to draw more attention to their problems. Taken as a whole however, such a high response rate indicates the participants' enthusiasm for matters related to their lives. Such interest may form a basis for health promotion interventions.



5.3 GENERAL FINDINGS RELATED TO DEMOGRAPHIC FACTORS

The mean age of the participants in the study is relatively low. The low mean age conforms to the civil war events that were responsible for the major cases of amputation. The most active individuals appear to have been more exposed to land mine and gunshot injuries during and immediately after the war. Moreover, there was a great standard deviation, which signifies a great variation in the age of the study sample. Such variation signifies the circumstances of most war disasters, in which individuals of different ages are indiscriminately at risk of injuries.

In their study, Anderson *et al.* (1995) reported similar findings. Men of economically active age were at the highest risk of land mine injuries. In addition, Livingston *et al.* (1994) reported a relatively similar mean age of 34 years on a sample of traumatic lower limb amputees. In contrast, studies based in Western countries on individuals with lower limb amputation indicate that most individuals are 60 years or older (Pernot *et al.*, 1997). This is because peripheral vascular disease and diabetes are by far the most common causes of amputation in the Western countries (Condie *et al.*, 1996; Trautner *et al.*, 2001).

More males than females participated in the quantitative study survey at a ratio of 5:1 respectively. Despite the possibility of a response bias, it is likely that men who are often more involved in combatant operations, were consequently more at a risk of land mine and gunshot injuries than women. Secondly, in some African countries particularly Rwanda, men are more economically active. They are more involved in daily outdoor subsistence activities such as digging, collecting firewood and rearing animals in the field. Thus, men seem to have been more susceptible to land mine injuries either during the war or after. However, the proportions of female participants were most likely not involved in war combatant operations. Therefore, there is strong likelihood that female participants had amputation due to land mine injuries while doing farm work on the field. This indicates that land mines are most likely still at large everywhere in the fields.

There was a high level of unemployment in the study. This level of unemployment appears to be similar to the 32% unemployment level of the general Rwandan population (pp 220-221, Office of the Minister of Finance and Economic Planning, 2000). In contrast, Schoppen *et al.* (2001) reported a higher employment level of 64%. However, there was no significant difference in employment level between their study and a sample of the general Dutch population. In addition, there was a great variation in Provinces regarding the number of participants involved in active employment. For instance, the ratio of participants who were actively employed in Kigali Ville Province to the rest of the participants was about 1:5 respectively compared to 1:20 for Ruhengeri Province.

The majority of the participants had unilateral below-knee amputation (trans-tibial). However, there was almost an equal number of unilateral above-knee and below-knee amputations. Similarly, in their study, Nissen *et al.* (1992) reported more or less equal percentage of unilateral below-knee and above-knee amputation. Trans-tibial amputations are the major amputations seen especially in war circumstances because of explosive munitions (Dougherty (2001). The almost similar number of unilateral above-knee and below-knee amputation is because land mine injuries usually affect other tissues in the vicinity. The blast wave of the land mine travels up the bones of the leg. Pearn (1996b) reported that open avulsion becomes necessary because of bony as well as soft tissue devitalisation. This results in amputation being performed well above the original site of injury.

In general, the percentage of the participants who had ambulatory devices was high in all Provinces, although most participants considered their devices as being in a poor condition. The percentage of ambulatory devices in a good functional condition was very small compared to 83.3% reported by Brodzka *et al.* (1990). The percentage of those who had ambulatory devices in a very poor condition appeared to be nearly equal to the percentage of those who were unemployed. It is probable therefore that, this percentage of participants who were unemployed could not even afford to buy the original ambulatory devices. This is because most devices were donated freely earlier on during emergency programmes in 1995 to 1998 (United Nations International Children's Emergency Fund (UNICEF), 1995).

The most common cause of amputation was land mine injuries. Land mine injuries are reported as the major causes of amputation in war-ravaged countries (Anderson *et al.*, 1995, Pearn, 1996b). Rwanda has been reported as one of the countries at a high risk of land mine injuries since widespread plastic, butterfly-shaped land mines were sometimes dispersed by air during the recent civil war (Pearn, 1996b). Besides, Dougherty (2001) recently reported a likelihood of an increasing number of amputations. Dougherty (2001) further noted that over ninety million land mines remain planted in war-devastated countries of the world. The second most common cause was gunshot injuries, followed by trauma. Gunshot injuries, complications of war trauma, falling in to pits, or direct confrontations appear to have been major circumstances that led to amputations (Labeuu *et al.*, 1996; Farrow, 1998; Farrow *et al.*, 1997).

However, a comparatively smaller number of amputations were due to diseases such as peripheral vascular diseases, diabetes and cancers. In contrast, a number of studies based in Western Countries, report peripheral vascular disease as the most common cause of amputation followed by diabetes (Condie *et al.*, 1996; Cutson and Bongiorno, 1996; Durance, 1989; Frykberg *et al.*, 1998; Pohjolainen *et al.*, 1989). Furthermore, in an overview of literature using various computer databases Pernot *et al.* (1997) found that peripheral vascular disease was the major reason for amputation in most Western Countries.

5.4 PARTICIPANTS' LIFESTYLE BEHAVIOURS AND INFLUENCING FACTORS

The findings of the study related to the participants' lifestyle behaviours are alarming. There is a great concern regarding participants' involvement in various health-risk behaviours. The majority of participants lived a physically inactive lifestyle, a good number were either tobacco users or alcohol consumers, while others were involved in drug abuse. To make matters worse, a good number of participants practised a combination of various risky health behaviours. For example, 25% of the sample lived a physically inactive lifestyle and were alcohol consumers. In addition, most participants did not have access to relevant information.

5.4.1 Participation in physical activity or exercise

Most participants did not participate in any physical activity or exercise. Lack of participation in physical activity is common among people with physical disabilities. In an assessment of lifestyle health behaviours among young people with physical disabilities, Steele *et al.* (1996) reported a high level of sedentary lifestyle. More recently, Hogan *et al.* (2000) further reported that young people with physical disabilities were living a physically inactive lifestyle. Although the significance of physical activity for people with physical disabilities has been highlighted (Kailes, 2000; Sherphard, 1991), many reviews continue to report a high level of inactivity among people with physical disabilities (Cooper *et al.*, 1999; Rimmer, 1999).

For even the few individuals who participated in physical activity, a small number participated at the recommendable frequency, either every day or 3 times a week. However, the qualitative data indicated that some participants were involved in day-to-day activities in the mountainous terrain that dominates the country. Such activities include fetching water a long way, collecting firewood or digging that are associated with a high heartbeat rate, increased oxygen uptake and increased energy expenditure. One participant explained,

"...I live high up in a mountainous area, I walk up and down the hill several times a day looking for this and that. On Sunday, I go to pray far up the hill; you

see the Church is built far up. I would say, I do not do it (participate in exercise) regularly; but I do walk here and there when I need something..."

It is quite clear that some participants, especially those in Ruhengeri, which is characterised by a mountainous terrain, are probably involved in some level of physical activity. It has been indicated that hard physical labour for subsistence characterises the general African population (Bénéfice and Cames, 1999). It is probable that the number of participants in the sample who were engaged in exercise on a daily basis or 3 times a week participated at the recommended intensity. Even if this were true, this is still a very small percentage of the sample.

Clearly, a greater number of participants lived a physically inactive lifestyle. Although individuals with LLA may be guided to participate in physical activity (Burgess and Rappaport, 1993), the majority still do not engage in physical activity. Recently, Rimmer (2000) reported that most people with physical disabilities live a sedentary lifestyle, and those who participate in exercise programmes, do it at a less than the recommended intensity. Individuals with lower limb amputation were reported to be physically inactive leading to increase in excess body fat (Kurdibaylo, 1996). Generally, a lack of physical activity patterns in the lives of most individuals with disabilities has been reported (Rimmer *et al.*, 1996).

5.4.1.1 *Physical activity participation in relation to age groups*

Participation in physical activity generally decreased with increasing age groups. Using the χ^2 -test, frequency of participation in physical activity was significantly associated with the participants' age groups ($p = 0.008$). However, collapsing of cell sizes was inevitable since the expected cell frequency values were initially less than 5. This certainly decreases the statistical significance due to a subsequent increase in age group range. In any case, it was noticeable that the percentage of the participants who lived a physically inactive lifestyle, that is to say, those who hardly ever or never participated in exercise, increased with increase in age group. In addition, for those who participated either on a daily basis or 3 times a week, there was a general trend of a decreasing number of participants as their ages increased.

Therefore, in this study sample, participation in physical activity decreased with increasing age. In general, Vuori *et al.* (1996) indicated that physical inactivity is more predominant in old age even for the general population because of characteristics of aging such as musculo-skeletal degeneration. Trends in the level of physical activity related to age among people with physical disabilities have not been noted (Rimmer *et al.*, 1996). However, variations in physical activity or exercise participation based on demographic characteristics include age, in which old individuals are generally less physically active (Cooper *et al.*, 1999). In general, disability exacerbates circumstances in which physical functioning deteriorates. As a result, this leads to a further reduction in physical activity levels among disabled individuals (Cooper *et al.*,

1999). Therefore, a physically inactivity lifestyle becomes even more common among elderly persons with disabilities due to the additional impact of the characteristics of aging. The need for health promotion for the elderly group of people with disabilities has been emphasised (Walker, 1994).

5.4.1.2 Physical activity participation in relation to some other demographic factors

A greater number of males than females participated in physical activity at a recommended health-enhancing frequency of either daily participation or three times a week. However, this does not mean that more males than females demonstrated higher frequency of participation since there was a greater sample of males than females. In a fact, using Fisher's exact Test, there was no significant difference in physical activity or exercise participation between males and females ($p > 0.05$). Furthermore, comparing the frequency of participation in physical activity between males and females using the χ^2 test, there was no significant difference in frequency of participation ($p = 0.275$).

There was a significant association between physical activity participation and level of amputation ($p < 0.05$). Participants with bilateral lower limb amputation were significantly ($p < 0.05$) less involved in physical activity than those with unilateral lower limb amputation. Similarly, participants with bilateral above-knee (trans-femoral) amputation participated less in physical activity than those with bilateral below-knee (trans-tibial) amputation. Furthermore, individuals with unilateral above-knee (trans-

femoral) amputation participated less in physical activity than those with unilateral below-knee (trans-tibial) amputation.

Energy expenditure in ambulation is higher for individuals with greater physical disabilities than their counterparts. Pitetti, (2000) noted that for individuals with lower limb amputation, the energy cost of walking is directly related to the level of amputation. Individuals with higher levels of limb amputations have been indicated to be less physically active than those with lower levels of amputations (Livingston *et al.*, 1994). Physical inactivity is due to greater energy demand for ambulation. For instance, when lower limb amputees were allowed to choose their own comfortable walking speed, compared to their able-bodied peers, the mean energy cost was 9% higher in unilateral below-knee, 49% higher in unilateral above-knee, and 280% higher in bilateral above-knee amputees (Pitetti, 2000).



5.4.1.3 *Barriers to participation in physical activity*

In general, people with physical disabilities face numerous barriers to physical activity participation. Lack of knowledge to exercise, was one of the major barriers to participation in physical activity or exercise. In the quantitative survey, the majority of the participants stated that they did not know where the exercises were carried out. One participant further clarified this factor in the qualitative findings as,

"...I do not know if there are places around for us to do the exercises. Other people [the non-disabled] do the exercises in these places ... I really do not know where others like us do the exercises".

Lack of knowledge of where to exercise by people with physical disabilities, is a major barrier to physical activity participation even in more developed countries. For instance, lack of knowledge of where to exercise was ranked first by 58% of the study sample among women with physical disabilities (Rimmer *et al.*, 2000). Lack of knowledge of where to exercise has been reported in some other studies (Shephard, 1991; Stuifbergen *et al.*, 1990).

The second highest barrier was lack of motivation, which influenced participants' involvement in physical activity. In the qualitative review, one participant further expressed lack of motivation to engage in exercise as he explained,

"...If I could get someone to enlighten me about the exercises. Personally, I lack someone to motivate me, you know. I used to do some jogging when I was young, and I felt very strong and healthy. Now I would do something else..."

Similarly, another participant said,

"...I do not do physical activities, not because there are no facilities, but I have never thought about it. Where would I start? I am sure I can also manage those manoeuvres [the exercises], but I have never thought about those exercises. In a fact, no one has ever encouraged me to start the exercises..."

This finding is in agreement with the results in a number of studies. People with physical disabilities report lack of motivation as one of the main barriers to participation in physical activity or exercise (Stuifbergen *et al.*, 1990; Rimmer *et al.*, 2000). Furthermore, women with multiple sclerosis reported interest to engage in exercise, but lacked the courage to start participation in physical activity (Stuifbergen and Rogers, 1997).

Participants in the quantitative survey reported a number of other barriers. These included lack of energy, high cost of transport and ambulatory devices, health concerns and other barriers that included lack of time, interest or facilities. In the qualitative findings, one participant echoed these barriers in this citation,

“...I would say I do not do any physical activity. Where would I get the time my friend, with...[laughs], my family expects me to work.... and earn a living, and make my family comfortable...”

Therefore, it appeared that in typical strained African economies, the few physically disabled individuals who were employed devoted most of their time to survival of their families.

Lack of transportation, lack of facilities, lack of financial resources, and lack of time have been reported as major barriers in a number of studies (Rimmer *et al.*, 2000; Stuifbergen *et al.*, 1990; Stuifbergen and Rogers, 1997). The effect of such barriers deprived persons with disabilities of the opportunities to increase their overall well-

being and quality of life (Stuifbergen *et al.*, 1990). Lack of financial resources and lack of time appear to be barriers to participation in physical activity even for the non-disabled individuals (Kailes, 2000; Rimmer, 2000). Most of these barriers to physical activity participation have been identified among people with disabilities elsewhere in developed countries (Messent *et al.*, 1999). It is clear that in order to facilitate people with physical disabilities to participate exercise programs, such barriers need to be eliminated.

5.4.2 Use of tobacco, drugs, alcohol and influencing factors

The number of individuals involved in substance usage seemed to vary according to the type of the substance. The majority were consumers of alcohol, followed by tobacco users, and the smallest number of participants were drug abusers.

An unfortunate finding in the current study was that the frequency and quantity of tobacco smoked daily was high for the majority of the participants. Possibly, this could have been due to tobacco addiction. Similar to the current study, tobacco smoking has been reported to be prevalent among young people with different physical disabilities (Steele *et al.*, 1997). Tobacco smoking was also found to be common among individuals with lower limb amputations (Stewart, 1987). Furthermore, higher rates of tobacco smoking were reported among students with disabilities compared to their non-disabled peers (Hogan *et al.*, 2000).

Concerning substance usage in relation to age group, χ^2 -test indicated that substance usage was significantly related to age groups ($p < 0.05$). Generally, substance usage decreased with increasing age. However, the greatest substance users appeared to be in the age group of 21-30 years. For the general population, adolescents and the youth appear to be the greatest tobacco users, as the majority start smoking during adolescence (Swart, 1998). Dean *et al.* (1985) reported that persons with physical disabilities are equally involved in substance usage regardless of age. Nevertheless, studies have reported a lot of cases of substance usage among young people with physical disabilities (Hogan *et al.*, 2000, Steele *et al.*, 1995; Steele *et al.*, 1996; Steele *et al.*, 1997).

Generally, substance usage appeared to be greater in males than females. Fishers exact Test indicated significant association between substance usage and gender ($p < 0.05$). A relatively greater percentage of males than females used drugs. In addition, more males than females used tobacco. However, a relatively higher percentage of females used more tobacco daily than males. Few studies have reported substance usage among people with physical disabilities, and to the investigator's knowledge, none appear to have focussed on gender difference. However, Dean *et al.* (1985) reported higher percentage of females than males with disabilities to have been substance abusers.

An amazing finding from the quantitative part of study was that a greater percentage of unemployed participants were substance users than those who were employed. Since

tobacco, alcohol and drugs may often be extremely expensive for unemployed persons, some participants appeared to have resorted to getting money for these substances by all means, possibly through begging due to depression, frustration and other sorts of dilemmas. One participant in the qualitative interviews supports this argument. He said,

“...I take a bit [refers to drugs] and tend not to think a lot about my problems. I am not a professional, have no job, yet I have to do this and that to survive, and my family off course...”

There was no significant relationship between substance usage and level of amputation ($p > 0.05$). Therefore, although most substance users were unilateral above-knee and below-knee amputees, generally, the level of amputation did not seem to influence substance usage.

5.5 OTHER FACTORS ASSOCIATED WITH HEALTH-RELATED BEHAVIOURS

A number of other factors influenced the participants' health-related behaviours. One of the noticeable factor was peer influence on participants' health-related behaviours. There was a significant association, but weak correlation between peer influence and either alcohol consumption or use of tobacco.

The most highly reported factor was acceptance of changes in life and life plans due to loss of a limb. Realistically, accepting a disability and the changes that accompany it,

in terms of abilities to perform certain tasks, is a prerequisite to engaging in health-promoting behaviours. This acceptance of a new life with impairment and its demands, influenced the participants' choice of appropriate plans in life such as accepting less physically demanding jobs.

Possession of functional ambulatory devices seemed to influence the participants' involvement in physical activity. The influence of ambulatory devices was indicated by a group of the participants in the quantitative findings. Moreover, in their study, Legro *et al.* (1999) emphasized the functional importance of prostheses for promotion of physical activities of daily living.

Indeed, possession of ambulatory devices was significantly associated with participation in physical activity ($p=0.006$), but the condition of the ambulatory devices did not appear to significantly influence participation in physical activity ($p>0.05$). However, the qualitative data findings furnished more explanation about the importance of the possession of a good functional ambulatory device since it influenced mobility and activities of daily living. One participant observed,

"...It is difficult for me to work without this metal [refers to the prosthesis]. Last week it broke, and I couldn't go anywhere. You see it is old, and I wonder if I will get the money to buy another. You know those things [refers to the exercises] need somebody who has the means..."

Therefore, possession of ambulatory appliances in good functional condition seemed to have an important place in functional mobility and ability to perform one's daily tasks. Pernot *et al.* (2000) indicated the importance of good functional prostheses, and reported that the quality of life of lower limb amputees was closely related to daily function using ambulatory devices. In addition, similar findings were reported by Legro *et al.* (2001), in which the effectiveness of the prostheses made a positive contribution to the amputees' abilities to accomplish recreational activities.

A good number of participants reported that the demands of disability, like being unable to do things with or for the spouse and the children, conflict over amount and quality of work, influenced their lifestyles behaviours. It is likely that due to disability, some participants could have experienced some guilt about the burden placed on the spouse or children. Many experience job changes; others have to work longer hours to accomplish same tasks. These wide demands of disability appeared to influence the participants' ability to engage in health-promoting behaviours, and may have impacted negatively on their overall well-being.

The significance of facilities, such as availability of appropriate playgrounds, exercise equipment and other facilities appeared to be a major factor. These facilities influenced the participants' engagement in physical activity or exercise. In some countries including Rwanda, there is even a lack of adequate facilities for the general population to participate in physical activity or exercise. However, since the country is

extremely mountainous, some participants believed that such a landscape enhanced their level of habitual physical activity. One participant noted,

“...I usually do some physical activity; you know I live high up in a mountainous area. I walk up and down the hill several times a day looking for this and that. On Sunday, I go to pray far up the hill; you see the Church is built far up. I would say, I do not do it regularly; but I do walk here and there when I need something. Yes, I do physical activity because it raises my morale and makes me feel strong...”

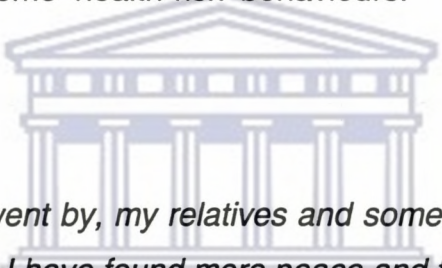
The terrain of Rwanda is essentially mountainous, and daily activities demand some level of habitual physical activity. Nevertheless, the level of physical activity may not be sufficient for health-related benefits. Even for unfit individuals, the recommended maximum heart rate (HR_{max}) of 40-49% and maximum oxygen reserve (VO_2R) of 55-64% may not have been attained (Pollock *et al.*, 1998; Swain and Leutholtz, 1997). Therefore, in order for exercise programs to take place, appropriate facilities including playgrounds need to be made available.

5.5.1 Factors related to professional and social information support

According to the findings of this study, a number of resources influenced health-related behaviours. The major resource was information support. A good number of participants in the quantitative survey regarded access to relevant information as an important issue for participation in physical activity or exercise. With regard to sources

of information support, most participants received or sought information support from health care professionals, such as physiotherapists, orthopaedic technicians, nurses and medical doctors. Some participants however, received and sought information support from parents, relatives, and spouses. Some indicated that friends, clergymen, including priests, nuns or pastors were instrumental in their practice of health-promoting behaviours.

In the qualitative findings, information support was regarded as extremely important in participants' choice to engage in various lifestyle behaviours. In some cases, it facilitated them to quit some health-risk behaviours. As one of the participants explained,



"...Slowly as time went by, my relatives and some friends advised me to stop it [use of drugs]. Now I have found more peace and time to reflect on my life..."

These findings are congruent with a number of studies. For example, individuals with multiple sclerosis described spouses, friends, and family members as extremely supportive (Stuifbergen and Rogers, 1997). In addition, the significance of information support on regular check up visits reportedly uncovered problems with poor prosthetic use, and eliminated unnecessary problems among lower limb amputees (Legro *et al.*, 1999). Therefore, like in other studies, information support in this study appeared to be one of the most significant resources that facilitated the participants' involvement in various health-promoting behaviours (Rimmer *et al.*, 2000; Stuifbergen and Rogers, 1997; Stuifbergen and Roberts, 1997).

As regards aspects in which the participants received or sought information support, the majority of the participants did not seem to seek or receive information support on a number of issues. Of the greatest concern is that the highest percentage of the participants did not have access to relevant information about the importance of participation in physical activity. What one participant expressed in the qualitative data findings further confirms this:

"...On the day for the disabled, I saw what the boys were doing, those boys from Gatenga [Centre for training acrobats], I felt moved. I am sure I can also manage those manoeuvres, but I have never thought about those exercises. In a fact, no one has ever encouraged me to start the exercises..."

Furthermore, most participants did not have access to relevant information about the dangers of tobacco smoking and alcohol consumption. Instead, participants appeared to have access to more information regarding the care of their stump and stress management techniques.

Similarly, some studies have reported a lack of access to relevant information regarding health-promoting behaviours such as physical activity participation and quitting tobacco smoking (Bonohue, 1997; Christman *et al.*, 2001). Furthermore, other people with physical disabilities have reported such information as an essential factor that influences their engagement in health-promoting behaviours (Stuifbergen and Rogers, 1997). In contrast, concerning the appropriate use of prostheses, individuals

with lower limb amputation were reported to receive and seek information on periodic check-up visits, a practice which could often eliminate unnecessary suffering and deterioration in health (Legro *et al.*, 1999). Besides, relevant information, concerning the care of the stump, is important. Pitetti (2000) indicated that care of the stump by preventing skin breakdown and the proper use of appropriate stump socks, were essential.

5.5.2 Factors related to psycho-social well-being and self-perception

The participants' psycho-social status appeared to be low. Approximately one-third of the participants were not happy with life, and a good number reported less than at least 2 evenings out a week. A number of them were lonely, isolated and others felt very low in society.

In general, the χ^2 -test indicated no significant difference between the participants' psycho-social status or self-perception and physical activity participation or substance usage ($p > 0.05$). Some participants also reported a lack of self-esteem, guilt for burdening others, frustration, depression and irritability as aspects that influenced their involvement in substance usage. From the qualitative findings, this factor seemed to have had a strong influence on the participants' choice to engage in risky health behaviours, such as drug abuse or tobacco smoking. One participant gave more explanation for this factor as follows:

“...I wouldn't like to take drugs, smoke or even drink alcohol, but my friend, if you were in my place, you would find yourself doing all this too. To me life has changed. When I lost the first leg, at least, but now things are not easy. I feel low in society...[shakes head] inferior to others, and have to accept any job. Certainly life plans have changed, some how I try to swallow it but...[stops]...”

Another participant expressed why he used more drugs after amputation,

“...I started to take drugs nine years ago before I lost a leg. When I lost my leg, I found myself taking more of it [drugs]. More because when I am in low spirits, may be depressed, and I take it, I feel delighted and tend to forget lots of troubles...”

It appeared therefore that the participants' low self-perception and psycho-social status resulted in issues related to lack of self-esteem, frustration, and sometimes depression, which were likely to influence their choices to engage in health-risky behaviours. Similarly, some studies have indicated that psychological problems including depression, frustration and low psycho-social status have been attributed to substance usage among people with physical disabilities (Dean *et al.*, 1985; Motet-Grigoras and Schuckit, 1986; Zola, 1982).

Physiotherapy rehabilitation that encompasses all aspects of an individual, including self-perception, is essential. Appropriate rehabilitation should commend the positive attitudes towards the lives of individuals with LLA (Gallagher and MacLachlan, 2000). Emphasis on such aspects would achieve adequate rehabilitation goals and promote a

multidisciplinary approach to rehabilitation, which would enhance the well-being of persons with physical disabilities.

5.6 PARTICIPANTS' PERCEIVED HEALTH-RELATED NEEDS

The majority of the participants reported that they desired to attend most programs. At least a mean percentage of approximately 80% or so perceived the respective programs assessed as health-enhancing. The highest number of participants desired to attend teachings about HIV/AIDS awareness and prevention. Participants also desired to attain new lifestyle habits to improve their health, while others perceived health risk screening programs as essential. Although the majority of participants perceived all programs as fundamental, the highest number of participants did not desire to attend teachings about weight management tips, why smoking is deadly or about exercise options and programs. Bearing in mind the potential dangers of tobacco smoking and physical inactivity, this finding further reflects the participants' lack of access to relevant information.

With regard to other programs participants desired to attend in order to improve their well-being, most participants desired to be taught vocational training programmes such as carpentry, motor mechanics or computer knowledge. Some participants desired to learn how to manage projects and business. One participant in qualitative interviews further expressed such views:

"...I am sure something like vocational training can help us, say carpentry, motor mechanics, welding would be helpful. We would even be organised in one place to do several activities together, like exercises, and so on..."

Other participants considered access to relevant information and motivation as essential for their participation in health-promoting activities. One participant noted,

"No body tells us about these things. The other day when I went to the clinic, by chance, the health worker was talking about HIV/AIDS prevention and awareness. I stopped and listened. You have to find out yourself, even with physical activity, exercises, I try to do some weight lifting, but ... it is difficult alone. Possibly we need to do it together, we could all get involved. So nobody really talks about it, I used to do it when I was still at Kanombe [a rehabilitation centre]"

Health interventions need to focus on the development of exercise programs through group participation as one participant explained,

"...Possibly we need to do it together, we could all get involved. So nobody really talks about it, I used to do it only when I was still at Kanombe [a rehabilitation centre]."

In addition, participants considered issues like disability funds, resuming school, knowing their number in the country and medical services as essential. One of them explained,

“...I am sure the government can do something for us...Maybe they can arrange to give something to us to make ends meet, say every month ...[pauses] I do not know, but something to help us [a monthly disability fund]. I am sure we would even be able to do those exercises...”

Comparing these findings with other studies, lezzoni *et al.* (2000) recently indicated that people with physical disabilities, mainly those with orthopaedic conditions like amputees often desire to attend health-promoting activities. Recognition of the importance of vocational training as an important need for people with disabilities, including those with lower amputation has been emphasized (Pandian *et al.*, 1994). In addition, with regard to what the participants needed most to improve their health, some desired to have employment opportunities.

In some other studies, participants desired to attend health-promotion services more frequently than disability-related services, and participants were specifically interested in access to exercise, and stress management (Stuifbergen *et al.*, 1990). Furthermore, Edwards (1996) reported that spinal cord injured patients expressed the need to attend exercise programs as an important health promotion need. Individuals with lower limb amputation were reportedly interested in recreational activities (Legro *et al.*, 2000).

5.7 IMPACT OF THE STUDY FINDINGS

The findings of the current study are critically challenging, both to health care professionals and policy makers. The majority of participants in the study were physically inactive, leading sedentary lifestyles. A good number of participants were involved in substance usage including tobacco smoking, use of drugs and alcohol consumption. It is apparent that, the consequences of the current study findings are two-fold: the effect of physical inactivity and substance usage as health-risk behaviours, and the effect on Rwanda's national health service provision.

5.7.1 The impact of physical inactivity and substance usage

The kind of lifestyle participants appear to have been engaged in, would consequently impact negatively on the existing primary conditions. For individuals already affected by some disability such as amputation, physical inactivity would render them more incapable of performing activities of daily living. This is more particular for those with greater impairment like bilateral amputees, who may have to rely on wheelchairs for ambulation.

The consequences of physical inactivity would result in a rapid build-up of calories, which need either to be lost through physical activity, or accumulated in the body as excess body fat mass. The only ways to maintain a balance and avert the possibility of the onset of obesity is to lower calorific food in-take or increase the levels of physical

activity (Rimmer *et al.*, 1993). It is clear that, there is an absence of information support on health matters, as expressed by one of the participants:

“...No body tells us these things [engaging in exercise]. The other day when I went to the clinic, by chance the health worker was talking about HIV/ AIDS prevention and awareness. I stopped and listened. You have to find out yourself...”

Therefore, if physical activity is not promoted, most participants could likely become obese. Development of obesity for individuals with LLA would prevent the possibility of retaining prostheses due to decreased prosthetic fit. Due to decreased mobility, the individuals in question would further become more inactive. Already some participants reported their ambulatory devices to be in a very poor condition, and others reported having no ambulatory devices at all. Certainly, individuals who have higher levels of amputation would likely be most affected. Kurdibalyo (1996) found that increase in body fat mass was directly related to level of amputation. This is reasonable since individuals with greater disability are often less physically active.

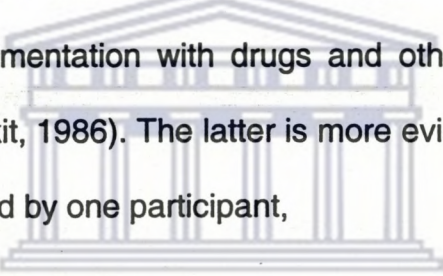
Individuals with LLA need more energy for ambulation than their non-disabled peers, either for use of crutches, prosthetic gait or wheelchair. This places greater demands on such individuals, and challenges them to develop both physical fitness and to improve their cardiovascular endurance. From the study, it was apparent that most individuals lived a physically inactive lifestyle. Therefore, this is likely to result in poor

cardio-pulmonary endurance and reduced physical fitness, both of which further render the individuals with the disability more inactive.

Kurdibaylo (1996) indicated that the outcome of physical inactivity, resulting in vascular diseases and coronary heart diseases, is due to Hyperlipoproteidemia. In the long-term perspective, therefore, the effects of physical inactivity and substances usage like tobacco smoking would have many hazardous consequences. This increases the risk of developing atherosclerosis, stroke, coronary heart diseases, non-insulin dependent diabetes mellitus and pulmonary diseases (Rimmer, 2000; Cooper *et al.*, 1999; Vuori *et al.*, 1996).

The consequences are severe. An individual who already has a primary disability is susceptible to other risky secondary complications due to a poor choice of lifestyle. According to Swart and Reddy (1998), tobacco smoking contains 43 known cancer-causing agents. Swart and Reddy (1998) further noted that the abuse of tobacco can lead to a wide range of chronic diseases of lifestyle including ischaemic heart diseases, cerebrovascular diseases, chronic obstructive lung diseases and tobacco-induced cancers. In addition, the participants would further be susceptible to the other effects of a physically inactive lifestyle in their old age. These include neuromuscular diseases and skeletal problems, such as degenerative diseases like osteoporosis. Consequently, this would lead to secondary complications, which would result in further deterioration of life status and a decrease in participants' quality of life.

The use of different substances by physically disabled individuals with LLA is similar to findings in other studies (Motet-Grigoras and Schuckit, 1986; Steele *et al.*, 1996; Stewart, 1987). It has been indicated that alcohol consumption and drug use, when combined with a physical impairment, may increase the risk for accidents resulting in other physical disabilities and emotional crises (Dean *et al.*, 1985; Motet-Grigoras and Schuckit, 1986). Furthermore, the premise for an association between handicaps due to diverse disabilities and substance use has been indicated. Firstly, alcohol and drug use may have predated the handicap and might even have contributed to it by increasing the risk for accidents (Finkle, 1982). Secondly, the additional stresses of learning to adjust to the physical disability and to the attitudes of the larger society may have contributed to experimentation with drugs and other substances (Zola, 1982; Motet-Grigoras and Schuckit, 1986). The latter is more evident from the findings of the qualitative data as explained by one participant,



“...I wouldn't like to take drugs, smoke or even drink alcohol, but my friend, if you were in my place, you would find yourself doing all this too. To me life has changed. When I lost the first leg, at least, but now things are not easy. I feel low in society...[shakes head]...inferior to others and have to accept any job. Certainly life plans have changed, some how I try to swallow it but...[stops].

Expressing similar views, another participant explained,

“... I started to take drugs nine years ago before I lost a leg. When I lost my leg, I found myself taking more of it [drugs]. More because when I am in low spirits,

may be depressed, and I take it, I feel delighted and tend to forget lots of troubles..."

The consequences of leading a physically inactive lifestyle, together with tobacco smoking, drug use or alcohol consumption are severe. The causes of drug-related deaths in most cases may be difficult to ascertain due to the poor quality of statistical data on these events (Jones, 2000). However, it is evident that most people die from either the high toxicological effects, or the effects of drugs may accelerate morbidity rates due to an already existing problem. Lack of relevant information on the use of drugs is a major challenge in many countries (Hall and Zador, 2000). The use of tobacco in particular has been indicated to be a major problem among individuals with low socio-economic status, including those with disabilities (Kaplan and Weiler, 1997). Analyses in the number of deaths due to alcohol, tobacco and other substances over a period, indicate that all ages and social classes are at risk (Unwin and Codde, 1999). Major mortality causes resulting from tobacco and other smoked drug substances are chronic obstructive lung diseases and lung cancer (Tashkin, 1990). The use of different substances by disabled individuals in the study would certainly exacerbate the level of existing primary disability. This would result in secondary complications, deterioration of life status, and in most cases would lead to increased mortality rates.

5.7.2 Effect on the country's health service provision

The development of secondary complications and diseases of lifestyle would have an adverse impact on the already under-staffed health care services. The sector of

rehabilitation therapy seems to be the most short-staffed due to higher physical disabilities as a consequence of the 1994 civil war. The consequences of physical inactivity, tobacco smoking, drug use and alcohol consumption, would lead to increased morbidity rates. This would result in an early on-set of higher mortality rates, thus tremendously decreasing the participants' life expectancy, In consequence, such trends would have an unfavourable social and economic impact on the participants' health status and immediate family members.

The consequences of physical inactivity would place a severe burden on the health of the majority of individuals with lower limb amputation as they reach older adulthood. This would further impact negatively on the health service provision as it will be much more costly to manage most diseases of lifestyle such as cardiovascular and pulmonary diseases. Furthermore, management of diseases of lifestyle like chronic obstructive lung diseases or ischaemic heart diseases is very expensive. This would have an increased deficit on the already insufficient national health budget (Office of the Minister of Finance and Economic Planning, 2000). Thus, such effects on an already strained national economy would result in an unremitting cycle of health problems borne by the majority of the population.

5.8 AMELIORATION OF THE IMPACT OF THE FINDINGS IN RWANDA

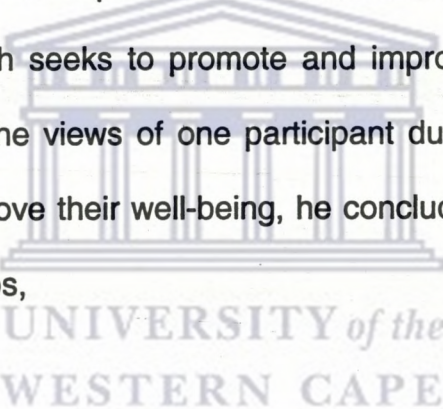
There is an imperative need to reverse the current state of affairs regarding the risky lifestyle behaviours of individuals with lower limb amputation in Rwanda. Individuals

with LLA need to be empowered to participate in health-promoting activities and practise wellness-enhancing behaviours. Physical activity and exercise programs need to be promoted in order to attain a higher level of physical endurance to cope with the already existing physical disabilities. In addition, the need for a good quality of life, which does not only include physical activity participation, has already been indicated (Fusetti *et al.*, 2001). Similarly, other studies have urged all people, and especially those with disabilities to refrain from risky health behaviours including the use of tobacco, drug abuse and alcohol consumption (Driessen *et al.*, 2001; Hughes *et al.*, 1999; Vollrath *et al.*, 1999; Zellweger, 2001).

It is important for health care professionals and policy makers to dovetail their efforts in encouraging health-promoting behaviours among people with physical disabilities, particularly those with lower limb amputation. From the study sample, participants' health-risk behaviours could be predicted using equation models. Although such models need to be validated using a larger sample size, it was evident that intervention can base on study findings to educate the participants' on the appropriate behaviours. The need to join efforts in developing and promoting health-enhancing activities for the general population was emphasised (Davis, 2000). However, Rimmer (1999) recommends a greater need to involve physically disabled persons, who need more attention since they are the most vulnerable members in society. Given the urgency of the matter, all policy makers should aggressively promote wellness-enhancing behaviours. In a recent review, Stanley (2001) indicated how vital it is to

promote well-being through education, behavioural change and research involving the most vulnerable groups of people in society.

The essence of health promotion is an active and self-care strategy. The maximisation of the "self-care strategy" would be more realized through the formation of support groups for individuals with physical disabilities, and in particular, those with lower limb amputation. It is true that nobody outside this subgroup of people can know their needs better. Health care professionals should come in, only to advise people with physical disabilities on the appropriate health-promoting behaviours. People with physical disabilities should spearhead all fundamental processes, including behavioural change, which seeks to promote and improve their quality of life. This argument is reflected in the views of one participant during interviews. In proposing programs that would improve their well-being, he concludes with an emphasis on the formation of support groups,



"I would think there are many things to do for us, the disabled- we need to earn a better living. Most of us do not work. When I was injured, I was hospitalised for two months, I then left school immediately after the war, and that was all. I am sure something like vocational training can help example carpentry, motor mechanics, welding and so on. We would even be better organised together, say in one place, to share views and experiences, and to do several activities ourselves, like exercises, and so on..."

The potential for the formation of mutual support groups and self-reliance cannot be underestimated. In a study based in KwaZulu-Natal, South Africa, Stewart and

Bhagwanjee (1999) demonstrated the importance of self-led support groups of people with spinal cord injury in self-reliance and group participation.

Health professionals should motivate disabled persons by offering them access to relevant information during early rehabilitation and treatment sessions. Information on risky behaviours needs to be provided early during initial treatment or rehabilitation sessions. Efforts to educate each disabled individual on wellness-enhancing behaviours should be proportionate to other rehabilitation or treatment goals. Actually, given the longer period people with disabilities spend during rehabilitation compared to other clinical interventions, rehabilitation has stronger potential to make health promotion successful and people-centred. Rehabilitation professionals are therefore challenged to assume the relevant roles to ensure this task.

The holistic approach to health promotion and behavioural change is a challenging one. Intervention strategies should take into account the interaction of major tasks to reverse the current situation. Educational programs for disabled amputees should be done through the media like radio, television and newspapers. One participant in the qualitative interview suggested the type of educational input needed:

“...You can teach us also other good things [behaviours]. You can possibly do it through the Friday radio teachings on health issues. You can also gather us on certain occasions, like how you have done it”.

However, one-to-one talk by clinicians and rehabilitation therapists is more highly recommended. Zellwelder (2001) recommended that the one-to-one method be included in the promotion of appropriate healthy behaviours, such as the cessation of tobacco in the daily practice of health care providers. Furthermore, Parrot *et al.*, (1998) emphasized the usefulness and cost-effectiveness of one-to-one talk in health intervention against health-risk behaviours including tobacco smoking.

Health promotion interventions that encourage participation in health-promoting behaviours would certainly improve the quality of life of lower limb amputees. Interventions would seek to include all people with physical disabilities. Such interventions would help to ameliorate or alleviate the effect of both the disability, modify certain risk factors, and set a path for a better quality of life in future. In their study, Zajicek and Michaela (1998) recommended this argument, in which health professionals ought to increase their commitment to promoting healthy lifestyles with a view to enhancing the disabled persons' self-direction in making optimal life choices.

The implementation and success of health-promoting strategies require an interdisciplinary approach. Such an approach would need to maintain strong commitment to research, evaluating the successes and failures of the programs. Since some health promotion programs, though not based on this study, have already started in Rwanda, the current study serves as a kind of 'process evaluation' for health promotion interventions among lower limb amputees. The high response rate of 86.5%

in this study is encouraging, and would be an essential foundation for developing and encouraging health promotion programs aimed at wellness-enhancing activities.

Despite the possible constraints in resources, evaluations of program activities need to encompass process evaluation, impact and outcome assessments. According to Coulson *et al.* (1998), both impact and outcome evaluations are essential in health promotion. In impact evaluation, the immediate effects of the interventions are often determined to ensure that activities or interventions meet the intended effects. However, Naidoo and Wills (2000) mainly commend outcome evaluations. Although outcome evaluations are more complex and costly, these evaluations are more reliable since they indicate maintained changes over a longer period. In most cases, outcome evaluations need to encompass control groups of participants who did not receive the interventions. This helps to avoid the possibility of attributing all lifestyle behavioural changes to particular interventions.

5.9 LIMITATIONS OF THE STUDY

1. Although a reasonably large number participated in the study, a response bias cannot be completely ruled out. However, in a country like Rwanda where it is very rare to do a research project in various Provinces, participants from various socio-economic backgrounds appear to have participated.

2. The questionnaire could not assess certain things. For instance, it only assessed frequency of participation in physical activity or exercise but did not assess the intensity of participation.
3. Substance usage, which assessed the number of cigarettes or rolls of tobacco smoked daily and frequency of alcoholic consumption, did not include the frequency of drug use.
4. For alcohol consumption, the questionnaire could have assessed how often the respondents got drunk say for the previous month. However, cigarette smoking and drugs are also addictive substances. People who start to use them are most likely to continue in the absence of information education from health care professionals. However, considering these limitations, a number of conclusions can still be drawn from this study.

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CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

In this final chapter, a concise summary of the study is provided. Details of the major issues in the study are given in the conclusion, and thereafter recommendations arising from the study are proposed.

6.2 SUMMARY

The purpose of this study was to determine the health promotion needs of individuals with LLA in Rwanda. The study specifically identified the participants' health-related behaviours, factors that influenced their behaviours, and major issues that needed to be targeted in health promotion.

This study was carried out on the premise that there had been an increase in the number of people with physical disabilities, especially those with LLA, following the 1994 civil war. Due to the presence of a primary disability, individuals with LLA are more at risk of secondary conditions than their non-disabled peers. In addition, poor choices of lifestyles, such as physical inactivity and substance usage can further result in a deterioration of their status in life. Traditionally, rehabilitation services have been designed mainly for individuals experiencing sudden on-set traumatic disabling conditions. Despite the potential of the rehabilitation process to impact on the disabled

lifestyles, few or no programmes have addressed issues to minimise secondary complications by promoting health-enhancing behaviours. This has left people with physical disabilities, particularly those with LLA, to face major challenges of promoting and maintaining their quality of life with little or no help from health care professionals.

The findings of the study present a grim picture. Over 50% of individuals with LLA in the sample were involved in risky health behaviours including physical inactivity and substance usage such as tobacco use, alcohol consumption or drug abuse. Participation in physical activity seemed to decrease with age. There was no significant difference in physical activity participation between males and females. Although participants in all age groups were involved in substance usage, the majority of substance users were in the age group 21-30 years. Substance usage was greater in males than females, although a higher percentage of females used tobacco substances more frequently every day than males. Lack of access to relevant information, participants' psycho-social status and self-perception, as well as negative peer influence played a major role in the participants' involvement in risky health behaviours.

6.3 CONCLUSIONS

Clearly, individuals with lower limb amputation in Rwanda had a number of health promotion needs, mainly resulting from risky health behaviours. The majority lived sedentary lifestyles, participating in less physical activity or exercise. A good number of participants were involved in substance usage like tobacco use, drug abuse or

alcohol consumption. In addition, participants were vulnerable to emotional disorders due to low psycho-social status and self-perception.

It was apparent that participants were at risk from additional or secondary disabilities including chronic obstructive lung diseases, cardiovascular diseases and ischaemic heart diseases. Physical activity or exercises needed to be promoted since in the long-term, the impact of physically inactive lifestyles might have serious risks of chronic diseases of lifestyle. Moreover, physical activity also needed to be promoted for short-term purposes, such as sociological gains including new relationships and friendships, experiences, and countering stigmatisation. It might further be promoted due to possible psychological benefits like reduction in anxiety and depression, increased self-esteem, and self-efficacy.

Furthermore, participants were susceptible to secondary conditions due to their involvement in risky health behaviours particularly substance usage. Although the majority consumed alcohol, a number of them were involved in use of tobacco and drug abuse. Alcohol consumption and drug use, for individuals who already have physical impairment may increase the risk for accidents resulting into other physical disabilities and emotional crises. Substance usage therefore may compound the existing physical disability.

In addition, participants were vulnerable to emotional disorders due to low psycho-social and self-perception. These appeared to be indicators of poor socio-economic status and well-being, which could have likely predisposed to drug abuse, alcohol

consumption or use of tobacco. Indeed, qualitative findings indicated that such psycho-social symptoms adversely increased participants' involvement in substance usage.

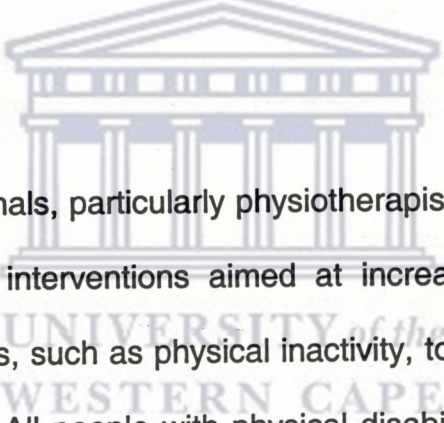
Taken as a whole, therefore, the impact of such lifestyle behaviours was detrimental to the participants' health status. If no health promotion programmes were put in place, this would result in poor quality of rehabilitation services. Consequently, this would increase morbidity and mortality rates, leading to an increase in the health care costs of a country whose health budget is already overstrained.

6.4 RECOMMENDATIONS

Based on the findings of the study, a number of recommendations are made:

1. There is an urgent need to intensify the de-mining program in the country, which has, at the time of this study, already started to remove the land mines that are still at large after the 1994 armed conflict.
2. It is recommended that health promotion interventions are incorporated in rehabilitation programs for people with physical disabilities, particularly those with LLA. Rehabilitation has great potential for the success of health promotion interventions. During this process, rehabilitation therapists, mainly physiotherapists, have the opportunity and expertise to provide educational programs on appropriate lifestyle behaviours. However, all other clinical interventions may encompass the health promotion programs.

3. There is a critical need to promote, encourage and develop physical activity participation among individuals with LLA in Rwanda. Since there are hardly any such programs in the country, preliminary interventions need to focus more on health promotion strategies such as setting up and developing participation in exercise programs. Physical activity programs need to aim at improving the muscular endurance levels of the physically disabled, so as to increase their ability to perform the activities of daily living. Thus exercise programs could include games like volley ball, cycling, jogging and encouraging other physical activities of daily living. These include fetching water, collecting firewood often far from the homestead, working in the gardens and looking after animals like cattle in the field.



4. Health care professionals, particularly physiotherapists, have an obligation to set up health promotion interventions aimed at increasing awareness of health-related risk behaviours, such as physical inactivity, tobacco use, drug abuse and alcohol consumption. All people with physical disabilities, particularly those with LLA should be urged to refrain from drug abuse, alcohol consumption and tobacco use. It is often argued that people should “start exercising and quit smoking” in order to prevent a wide range of chronic diseases of lifestyle. Secondly, health promotion interventions need to aim at identifying other health-risk behaviours.

5. Access to relevant information was found to be a remarkable resource influencing participants' behaviours. Therefore, health professionals need to offer adequate

information to help physically disabled people to refrain from health-risk behaviours, while encouraging health-promoting behaviours. For instance, adequate basic information needs to be offered on amputees' self-care to prevent skin break down or hair follicle infections, which can significantly affect the level of physical activity. Practising proper hygiene will help these skin problems. Stump socks (of the right size) need to be changed daily, and care should be taken to change them when they are damp or wet following an exercise programme. All these are essential as a prerequisite to participation in physical activity to prevent skin irritations and blisters.

6. A number of other recommendations include:

- (a) A number of factors influenced participation in health-related behaviours. The majority reported a number of barriers to physical activity participation. Thus, all interventions to promote physical activity or exercise among physically disabled individuals, particularly those with LLA, need to alleviate or eliminate such barriers.
- (b) Since the condition of ambulatory appliances significantly affected participants' mobility, likelihood of employment, absenteeism and productivity, it is important that the lower limb amputee uses an appropriate ambulatory device. Thus, the prosthesis needs to be in a good functional and comfortable condition that is suited to the activities or exercises of choice. It is hence recommended that the amputees work with respected orthopaedic technologists or prosthetists in obtaining the needed adaptations for their prosthetic limbs.

- (c) Physically disabled individuals, particularly those with LLA, need to maximize their health potential along various dimensions. To all, living a healthy lifestyle includes, among others, a dynamic balance of physical activity, social relationships and emotional considerations, while refraining from risky health behaviours such as substance usage.
7. It is further recommended that health policy makers consider the use of resources upstream, integrating health promotion and the prevention of complications into the rehabilitation process, instead of using resources only for expensive downstream care, after certain complications are irreversible.
8. Finally, a number of issues need to be studied further using a relatively larger sample size. Studies need to focus more on the precise health-promoting behaviour profiles like the physical activity of specific subgroups of people with physical disabilities. In addition, studies need to specifically establish barriers and determinants of involvement in various health-related behaviours. Since a number of participants did not consider themselves candidates for exercise programs, studies need to design and test intervention strategies to promote physical activity for different groups of people with disabilities. Lastly, an exploratory in-depth qualitative study is highly recommended to explore issues related to participants' self-perception and involvement in health-risk behaviours.

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DEPARTMENT OF PHYSIOTHERAPY

Date: 15/01/2001

The Minister of Health,
Republic of Rwanda,

Sir,

Subject: Request to conduct a research study in Rwanda

I am a postgraduate Rwandan student doing a masters degree programme in Physiotherapy at the University of the Western Cape in South Africa. I am expected to conduct a research project as part of the requirement for a masters degree in Physiotherapy. The title of my research thesis is ***'Health Promotion needs of physically disabled individuals with lower limb amputation in selected areas of Rwanda.'***

I hereby request your permission to conduct a research study based at Central Hospital of Kigali, Ruhengeri Provincial Hospital and Gatagara Centre for the Handicapped. Since the former is a referral hospital, participants in the study will likely come from various Provinces.

From this study, it would be possible to address the health promotion needs of physically disabled individuals with lower limb amputation, a strategy that is more cost-effective, and certainly more humane than waiting until there is deterioration in their function due to lack of good health maintenance. In a letter to the participants, it will be indicated that participation in this study will be anonymous and voluntary; and that all the information collected will be highly confidential.

Looking forward to your co-operation,

Eugene MUTUMURA 



Professor SL Amosun

Supervisor

REPUBLIQUE RWANDAISE

Kigali, le 19/01/2001

N° 20/118 /SG.I.1/2001



MINISTERE DE LA SANTE
B.P 84 - KIGALI.

Mr. Eugene MUTIMURA
Physiotherapy Department
University of the Western Cape
Private Bag X 17, Bellville 7535
Bellville – Cape Town
South Africa

Dear Mr. Eugene,

Concerns : Your request to do a research study
in three prefectures of Rwanda.

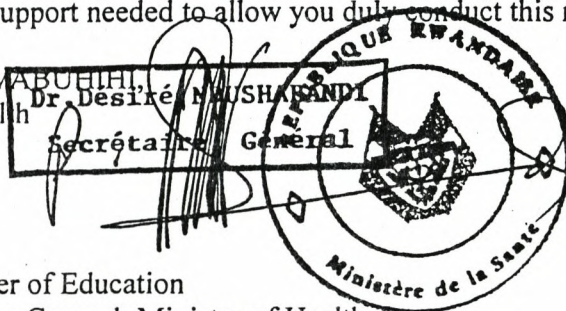
In reference to your letter dated January 15, 2001 requesting a permission to carry out a research study entitled "Health Promotion needs of people with disabilities in Rwanda: Lower limb amputation",

Acknowledging that little research has been conducted in this field in Rwanda given the current increasing number of people with disabilities; and that this study will be a boost to the Health sector as far as Physiotherapy is concerned,

I have the pleasure to inform you that the Ministry of Health has no objection concerning the above mentioned research study you are intending to carry out in Kigali, Gatagara and Ruhengeri, as part of the requirement for a Master's of Science degree in Physiotherapy. Also, I take this opportunity to recommend that competent authorities of the concerned hospitals give you all the assistance and support needed to allow you duly conduct this research.

Dr Ezéchias RWABUHIHI,
Minister of Health

Dr. Désiré NASHABANDI
Secrétaire Général



C.C. :

- Hon. Minister of Education
 - The Secretary General, Ministry of Health
 - The Director of CHK
- KIGALI
- The Director of Ruhengeri Provincial Hospital
RUHENGERRI
 - The Director of Gatagara Centre for the Handicapped
GATAGARA

MINISTRY OF DEFENCE
Directorate of Medical Services,
Kigali -Rwanda.

14/05/2001

Mr. Eugene MUTIMURA
University of the Western Cape,
Physiotherapy Department,
Private Bag X 17, Bellville 7535
Bellville-Cape Town
South Africa.

Dear Eugene,

In reference to your letter dated 11/05/2001 requesting to do a research study at Kanombe Military Hospital and Nyagatare Military Demobilization Settlement on "Health Promotion needs of physically disabled individuals with lower limb amputation in selected areas of Rwanda",

I am glad to inform you that you are allowed to conduct this study with patients who have lower limb amputation. I also take the opportunity to request the Director of Kanombe and head of Nyagatare Settlement to facilitate you to conduct the study.

I wish you the best of luck in your study,

Yours Sincerely,

Dr. MUREGO Charles
Director Medical Services
Ministry of Defence



c.c:

- The Director, Kanombe Hospital
- The Head of Nyagatare Settlement



University of the Western Cape

Private Bag X17 Bellville 7535 South Africa Telegraph: UNIBELL
 Telephone: (021) 959 -2542 Fax: (021) 959 -2804/3125

DEPARTMENT OF PHYSIOTHERAPY

Date: 23/04/2001

Dear Respondents,

I am a post graduate student doing a masters degree program in the department of Physiotherapy at the University of the Western Cape in South Africa. I am expected to conduct a research project as part of the requirement for a Master's of Science degree in Physiotherapy. This study will also be important to plan health promotion programs for you and other people in our country. The Title of my research topic is "**Health Promotion needs of Physically Disabled Individuals with Lower Limb Amputation in Selected Areas of Rwanda**".

I request you to complete this questionnaire; it will take only 15 to 25 minutes. However, if you do not like to answer these questions, feel free not to participate. Do not write your names on this questionnaire since the information you will give is highly confidential. Please strictly seal the completed questionnaire in the provided envelope.

Kindly return this questionnaire by 12/05/2001

Looking forward to your co-operation,

Eugene MUTUMURA

Central Hospital of Kigali
 Physiotherapy
 B.P 655 Kigali
 Tel: 7555 or 75158,
 Cell/ mobile: 08533586

QUESTIONNAIRE: PLEASE SELECT ONE OR MORE RESPONSES BY USING A TICK- {✓} IN THE BOX NEAR YOUR CHOICE. GIVE WRITTEN RESPONSES WHERE SPACES ARE PROVIDED.

SECTION A: SOCIO-DEMOGRAPHIC DATA

Please tell us about yourself

1. **What is your age?** Years
2. **What is your gender?** Male... Female...
3. **What is your marital status?**
 - Single.....
 - Married...
 - Separated...
 - Widowed...
4. **State your home province and district?**
 - Commune.....
 - District.....
5. **What is your highest education?**
 - Never went to school...
 - Primary, 1-6.....
 - Secondary, 1-3.....
 - Secondary, 4-6.....
 - Tertiary education.....
6. **What is your current employment or duty status?**
 - Active Duty.....
 - Dependent.....
 - Retired.....
 - Unemployed.....
 - Other (specify).....
7. **At what level of amputation did you lose your leg?**
 - Toe or partial foot (symes)..... Bilateral below-knee.....
 - Unilateral below-knee..... Bilateral above/ below knee.
 - Unilateral above-knee..... Bilateral above knee.....
 - Knee, hip disarticulation.....

8. **What caused the loss of your limb?**

- Land mine.....
- Gunshot.....
- Diseases, such as Vascular,
diabetes or cancer.....
- Trauma, such as accident,
- Other (specify).....

9. **Do you use any ambulatory device or appliance?**

- Yes.....
- No.....

10. **If yes, what type of ambulatory device or appliance do you use?**

- Wooden provisional (prosthesis)..
- A pylon.....
- Polypropylene definitive.....
- Axillary crutches...
- Wheelchair.....
- Elbow crutches.....

11. **What is the condition of your ambulatory device or appliance?**

- Good and functional....
- Repairable condition.....
- Very poor condition.....
- Other (please specify).....

SECTION B: HEALTH-RELATED BEHAVIOURS

Please tell us about your health

12. **Do you participate in any kind of physical activity or exercise like walking, weight lifting or cycling on a regular basis for a half an hour each time?**

- Yes... No....

13. How often do you participate in physical activity or exercise for at least half an hour each time? (If you never participate, indicate "Hardly ever or never").

- Everyday.....
- 3 times a week.....
- Once a week.....
- Hardly ever or never.....

14. If you do not participate in any kind of physical activity, what could be the reasons? (Tick {√} one or more answers)

- Do not know where to exercise.....
- Cost of transport or no ambulatory devices
- Have other health concerns
- Lack of motivation.....
- Lack of energy/ not sure if I can manage.....
- Other reasons (please specify).....

15. Do you smoke cigarettes, local tobacco or chew tobacco?

- Yes... No...

16. If yes, about how many times do you use cigarettes, local tobacco or chew tobacco daily?

- 1-5.....
- 6-10.....
- 11-20.....
- 21-30.....
- Over 30....

17. Do you use drug substances, like marijuana, opium, cocaine etc

- Yes..... No...

18. Do you drink alcoholic drinks like local brews ('ikigage' or 'Urwangwa'), beers, whisky or Uganda Waragi?

- Yes..... No...

19. If yes, how often do you drink these alcoholic drinks per week?

- Every day.....
- 3-4 times.....
- Once a week.....
- Hardly ever or never.....

SECTION C: SOME INFLUENCES ON HEALTH-RELATED BEHAVIOURS

Please indicate if you agree or disagree by using YES or NO response

20. *Facilities such as availability of appropriate playgrounds, availability of exercise equipment and other facilities influence your participation in physical activity or exercise.*

- YES.....
- NO.....
- NOT SURE.....

21. *Lacks of self-esteem, guilt of burdening others, frustration, depression, irritability influence your choice to use drugs, tobacco or alcohol.*

- YES.....
- NO.....
- NOT SURE.....

22. *Information support from friends, family members and health care professionals influences your choice to engage in physical activity or other behaviours.*

- YES.....
- NO.....
- NOT SURE.....

23. *Having ambulatory devices like wheelchairs, prostheses, crutches influence your participation in physical activity or exercise.*

- YES.....
- NO.....
- NOT SURE.....

24 Demands of the disability like unable to do things with/ for the family or conflict over amount and quality of work, result into frustration, depression, and thus influence your lifestyle behaviours.

YES.....	<input type="checkbox"/>
NO.....	<input type="checkbox"/>
NOT SURE.....	<input type="checkbox"/>

25 Changes in life due to loss of a limb influences your choice to accept a new lifestyle or engage in certain health-related behaviours.

YES.....	<input type="checkbox"/>
NO.....	<input type="checkbox"/>
NOT SURE.....	<input type="checkbox"/>

26 State briefly what you think you need most to improve your health?

.....
.....
.....

27 Which of the following best describes your peers or friends? Answer all.

(a) My friends drink a lot.

Strongly agree.....	<input type="checkbox"/>
Agree.....	<input type="checkbox"/>
Disagree.....	<input type="checkbox"/>
Strongly disagree.....	<input type="checkbox"/>
I do not know.....	<input type="checkbox"/>

(b) My friends smoke cigarettes, or pipe tobacco or chew tobacco a lot.

Strongly agree.....	<input type="checkbox"/>
Agree.....	<input type="checkbox"/>
Disagree.....	<input type="checkbox"/>
Strongly disagree.....	<input type="checkbox"/>
I do not know.....	<input type="checkbox"/>

(c) My friends spend a lot of time in clubs watching TV / video films a lot

Strongly agree.....	<input type="checkbox"/>
Agree.....	<input type="checkbox"/>
Disagree.....	<input type="checkbox"/>
Strongly disagree.....	<input type="checkbox"/>
I do not know.....	<input type="checkbox"/>

Please tell us about health information support

28 Do you receive or seek information about your health on the following?

Care for the stump.....	Yes.. <input type="checkbox"/>	No.... <input type="checkbox"/>
Participation in physical activity/ exercise	Yes... <input type="checkbox"/>	No.... <input type="checkbox"/>
Tobacco smoking.....	Yes... <input type="checkbox"/>	No... <input type="checkbox"/>
Alcohol consumption.....	Yes... <input type="checkbox"/>	No... <input type="checkbox"/>
Nutrition strategies/ eating practices.....	Yes... <input type="checkbox"/>	No... <input type="checkbox"/>
Stress management techniques.....	Yes... <input type="checkbox"/>	No... <input type="checkbox"/>

29 Who gives you information or advice about your health?

Health care professionals	<input type="checkbox"/>
Parents and relatives.....	<input type="checkbox"/>
Spouses.....	<input type="checkbox"/>
Other (specify).....	

30 Mark with {x} YES or NO your psycho-social status and self-perception

Do you have friends (one or more)?	YES.. <input type="checkbox"/>	NO.... <input type="checkbox"/>
Do you have self-confidence?	YES.. <input type="checkbox"/>	NO.... <input type="checkbox"/>
Do you have happiness in life?	YES.. <input type="checkbox"/>	NO.... <input type="checkbox"/>
Do you have 2 or more evenings out a week?	YES <input type="checkbox"/>	NO.... <input type="checkbox"/>
Do you feel isolated?.....	YES... <input type="checkbox"/>	NO.... <input type="checkbox"/>
Do you feel lonely?.....	YES... <input type="checkbox"/>	NO.... <input type="checkbox"/>
Do you feel very low in society?	YES... <input type="checkbox"/>	NO.... <input type="checkbox"/>

SECTION D: PERCEIVED HEALTH-RELATED NEEDS

Please tell us what programs you would like to attend

- | | | | |
|----|---|---------------------------------|--------------------------------|
| 31 | Teachings about Exercise Options & Programs: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 32 | Teaching about Weight Management Tips: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 33 | How you can stay Physically Active in Daily Activities: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 34 | Prevent Adult Diabetes: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 35 | Low Salt, Low Fat, Low Cholesterol Cooking: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 36 | Teaching About How to Improve Wellness: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 37 | Teaching About How to Manage Stress: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 38 | Back Care Management to prevent Back Pain: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 39 | Teaching About Why Smoking is Deadly: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 40 | About Safety Facts to keep you and Your Family Healthy: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 41 | Your Blood Pressure and What You Can Do About it: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 42 | New lifestyle habits to improve your health: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 43 | Health Risk Screening for you and your family: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 44 | Teachings about HIV/ AIDS awareness and prevention: | Yes... <input type="checkbox"/> | No... <input type="checkbox"/> |
| 45 | State anything else you would like to be taught to improve your well-being: | | |

.....

.....

.....

THANK YOU FOR YOUR PARTICIPATION



University of the Western Cape

Private Bag X17 Bellville 7535 South Africa Telegraph: UNIBELL
Telephone: (021) 959 -2542 Fax: (021) 959 -2804/3125

DEPARTMENT OF PHYSIOTHERAPY

le 23/04/2001

Muvandimwe,

Niga ibyerekeye ubuvuzi bwitwa 'Physiotherapy' muri Kaminuza ya Western Cape mu gihugu cya Afrika y'Epho, mu cyiciro cy'impamyabumenyi ihanitse ya Kaminuza. Kugirango nshobore kubona impamyabumenyi y'icyiciro nigamo ngomba kubanza gukora ubushakashatsi bujyanye n'byo niga. Ubwo bushakashatsi buzanafasha kandi mukugena gahunda za ngombwa kuri wowe ubwawe no ku bandi batugage b'igihugu cyacu mu kwirinda imibereho mibi ishobora kongera ingaruka mbi zaterwa n'ubumuga. Ubwo bushakashatsi buzaba bwerekeye **'Ibikenewe mu guteza imbere ubuzima bwabamugaye ariko kubulyo bwumwihariko abacitse amaguru. Ubwo bushakashatsi buzibanda kubijyanye n' imibereho mibi ishobora kongera ingaruka mbi zaterwa n'ubumuga, kandi buzabera muri tumwe mu duce tw'u Rwanda'**.

Murwego rw'ubwo bushakashatsi rero nagusabaga gusubiza ibibazo biri kumugereka w'uru rupapuro. Bizagusaba igihe kiri hagati y'iminota cumi n'itanu na makumyabili n'itanu gusa, kandi wunva utifuza kubusubiza, si agahato wabireka. Ntiwandike amazina yawe kuri uru rupapuro usubirizaho kuko ibisubizo utanga bigomba kuba ibanga ryawe. Nurangiza gusubiza, ubishyire mu ibahasha yabigenewe kandi witwararike kuyifunga neza maze uyigarure bitarenze nibura tariki ya 12 Gicurasi 2001.

Ngushimiye ubufatanye uzagaragaza,

Eugene MUTUMURA

C/o Ibitaro bya Kigali
Ishami ry'ubuvuzi bwa 'Physiotherapy'
B.P 655 Kigali Tel: 7555 or 75158,
Cell/ mobile: 08533586

IBIBAZO BY 'UBUSHAKASHATSI: Turabasaba ngo mukoreshe aka kamenyesho {v} mugusubiza. Tanga igisubizo kimwe cyangwa bibiri.

IGICE CYAMBERE

Tubwire muri rusange ibikurikira

1. **Ufite imyaka ingahe?**
2. **Igitsina cyawe nikihe?** Gabo Gore
3. **U'ingaragu cyangwa se warashatse?**
Nd'ingaragu.....
Ndubatse.....
Nd'umupfakazi.....
Natanye nuwo twashakanye.....
4. **Intara ukomokamo (Province) n'akarere (District) nibihe?**
Intara (Province).....
Akarere (District).....
5. **Amashuri wize nayahe?** Ntabwo nize rwose.....
Amashuri abanza.....
Icyiciro cya mbere.....
Icyiciro cya kabili.....
Kaminuza.....
6. **Urakora ubu ?** Ndakora.....
Ndafashwa.....
Nahawe pansiyu.....
Ndumushomeri.....
Ikindi (Vuga murimake)....

UNIVERSITY of the
WESTERN CAPE

7. **Ukuguru kwawe kwacikiye he?**

- Ino cyangwa ikirenge.....
- Nacitse ukuguru kumwe hepfo y'ivi.....
- Nacitse ukuguru kumwe hejuru y'ivi.....
- Nacikiye ukuguru mwivi/ mwitako.....
- Nacitse amaguru abiri hepfo y'ivi.....
- Nacikiye amaguru abiri hejuru y'ivi.....

8. **Ni iki cyatumye ucika ukuguru/amaguru?**

- Mine (Igisasu).....
- Barandashe.....
- Narwaye indwara zimitsi, sukari
(diabetes) cyangwa indi ndwara..
- Narakomeretse.....
- Indi mpanvu (vuga muri make)....

9. **Ukoresha icyuma gisimbura ukuguru cyangwa se imbago?**

- Yego.....
- Oya.....

10. **N'ubuho bwoko bwicyuma gisimbura ukuguru cyangwa bw'imbago ukoresha?**

- Icyuma gisimbura ukuguru cy'igiti cyagateganyo.....
- Icyuma gisimbura ukuguru cya polypropylene.....
- Ngendera mukagare.....
- Icyuma gisimbura ukuguru cy'igiti ntakirenge (a pylon).....
- Imbago zo mumaaha.....
- Imbago zoku inkokora.....

11. *Icyuma gisimbura ukuguru cyangwa imbago ukoresha biracyakora neza cyangwa birashaje?*

Icyuma cyange cyirakomeye, cyirakora neza...

Icyuma cyange gicyeneye gusanwa.....

Icyuma cyange cyirashaje cyane bikabije.....

Ikindi gisubizo (vuga muri make).....

IGICE CYAKABIRI

Tubwire ibyerekeye ubuzima bwawe

12. *Hari imyitozo cyangwa siporo ujya ukora nibura iminota mirongo itatu buri uko ukoze imyitozo?*

Yego.....

Oya.....

13. *Niba ukora imyitozo, uyikora incuro zingaha?*

Buri munsu.....

Gatatu mu cyumweru.....

Rimwe mu cyumweru.....

Ntabwo nyikora rwose.....

14. *Niba udakora imyitozo na rimwe, ni ukubera iki utayikora ? (watanga impanvu nyishi)*

Ntabwo nzi aho imyitozo (siporo) ikorerwa.....

Nta kagare, imbago cyangwa icyuma nfinite.....

Narahangayitse, narihebye kubera gucika ukuguru.....

Ntababingiramo inama arababyeyi, inshuti nabandi

Sinzi niba nabishobora, ntambaraga mba nfinite.....

Izindi mpanvu (tubwire muri make).....

15. *Unywa itabi, nk'isegereti, itabi rya kinyarwanda (igikamba) cyangwa utapfuna ubugoro?*

Yego.....

Oya.....

16. *Niba unywa itabi, urinywa nk'incuro zingaha ku muni?*

- 1-5.....
6-10.....
11-20.....
21-30.....
over 30.....

17. *Unywa ibiyobya bwenge nk'urumogi, marijuana, opium nibindi.....?*

- Yego.....
Oya.....

18. *Unywa izoga nk'ikigage, urwagwa, byeri, whisky, cyangwa kanyanga?*

- Yego.....
Oya.....

19. *Niba unywa izoga nk'ikigage, urwagwa, byeri, whisky na Uganda waragi, nink'incuro zingaha mu cyumweru?*

- Buri muni.....
Gatatu mu cyumweru.....
Rimwe mu cyumweru.....
Ntabwo nywa inzoga rwose..

IGICE CYAGATATU

**TUBWIRE NIBA WEMERA CYANGWA UTEMERA RWOSE IBI
BIKURIKIRA (KUVANA 20-25)**

20. *Kubura aho umuntu akinira, kubura imipira se n'ibindi byatuma udakora imyitozo, cyangwa atajya mu imikino.*

- YEGO.....
OYA.....
SIMBIZI.....

21. *Kutiyubaha, gutinya kuvuna abandi, kwiheba, nokwiheba bijyana n'ubumuga byatuma umuntu anywa itabi cyangwa n' inzoga, ndetse nibiyobya bwenge.*

YEGO.....
OYA.....
SIMBIZI.....

22. *Inama ugirwa n'inshuti, abo mumuryango se, abavuzi batandukanye; nko kugufasha kujya aho imyitozo ikorerwa byagufasha gukora imyitozo, cyangwa kujya mu imikino itandukanye.*

YEGO.....
OYA.....
SIMBIZI.....

23. *Kutagira imbago, akagare se, cyangwa icyuma gisimbura ukuguru byafasha udakora imyitozo, cyangwa ntujye mumikino.*

YEGO.....
OYA.....
SIMBIZI.....

24. *Ingaruka z'ubumuga zituma adafasha neza uwo mwashakanye, cyangwa abana bawe nkuko ubishaka, udakora se imirimo nk'uko bisanzwe. Ibyo byose byatuma uhindura imibereho ye.*

YEGO.....
OYA.....
SIMBIZI.....

25. *Impinduka mubuzima kubera gucitse ukuguru byatumye uhindura imikorere yawe mubuzima kubulyo*

YEGO.....
OYA.....
SIMBIZI.....

26. *Tubwire muri make icyo wakwifuzza kugirango ugire ubuzima bwiza?*

.....
.....
.....

27. **Dusobanurire neza ibyerekeye inshuti zawe**

(a) **Inshuti zanjye zinywa inzoga cyane**

Ndabyemera cyane.....	<input type="text"/>
Ndabyemera.....	<input type="text"/>
Simbyemera.....	<input type="text"/>
Simbyemera na busa.....	<input type="text"/>
Simbizi.....	<input type="text"/>

(b) **Inshuti zanjye zinywa cyangwa zitapfuna itabi cyane**

Ndabyemera cyane.....	<input type="text"/>
Ndabyemera.....	<input type="text"/>
Simbyemera.....	<input type="text"/>
Simbyemera na busa.....	<input type="text"/>
Simbizi.....	<input type="text"/>

(C) **Inshuti zanjye zijya kureba televiziyo no mumakwe cyane**

Ndabyemera cyane.....	<input type="text"/>
Ndabyemera.....	<input type="text"/>
Simbyemera.....	<input type="text"/>
Simbyemera na busa.....	<input type="text"/>
Simbizi.....	<input type="text"/>

Tubwire abakugira inama mu buzima

28. **Hari uwo usaba inama cyangwa ujya akugira inama mubyerekeye ibi bikurikira?**

Kureberera ukuguru kwacitse	Yego <input type="checkbox"/>	Oya <input type="checkbox"/>
Gukora imyitozo cyangwa siporo	Yego <input type="checkbox"/>	Oya <input type="checkbox"/>
Ibyerekeye kunywa itabi	Yego <input type="checkbox"/>	Oya <input type="checkbox"/>
Ibyerekeye kunywa inzoga (zisindisha)	Yego <input type="checkbox"/>	Oya <input type="checkbox"/>
Ibyerekeye imyifatire kumirire	Yego <input type="checkbox"/>	Oya <input type="checkbox"/>
Ibyerekeye imyifatire kubera guhangayika	Yego <input type="checkbox"/>	Oya <input type="checkbox"/>

29. **Ninde ujya aguha inama cyangwa uwo ugisha inama mubyerekeye ubuzima bwawe?**

Abavuzi, batandukanye	<input type="checkbox"/>
Ababyeyi, abavandimwe cyangwa inshuti.....	<input type="checkbox"/>
Umugore cyangwa umugabo wanjye.....	<input type="checkbox"/>
Abandi ?.....	<input type="checkbox"/>

30. **Subiza ukoresheje aka kamenyetso {X} Yego cyangwa Oya ibyerekeye imibereho, nimibanire yawe nabandi.**

- | | | |
|--|-------------------------------|------------------------------|
| Nfite inshuti imwe cyangwa nyishi..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| Kugira akanyabugabo..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| Nishimiye ubuzima ndimo | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| Nsohoka nibura 3 mucyumweru..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| Ntabantu bakunda kwicarana najye..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| Nkunda kwigunga..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| Ntabwo nubahwa aho mba..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |

IGICE CYAKANE : IBYEREKEYE IBYO WUNVA UKENERA GUKORA NGO AGIRE UBUZIMA BWIZA

Tubwire muri izi nyigisho izo wakwiga

- | | | |
|--|--------------------------------------|-------------------------------------|
| 31. Inyigisho y'imyitozo itandukanye na gahunda yayo..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 32. Inyigisho zo kumenya uko umuntu agabanya ubilo..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 33. Uko umuntu yahora akora burigihe ngo agire imbaraga..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 34. Uko umuntu yankwirinda indwara ya sukari ('diabeti')..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 35. Kwiga uko umuntu atarya umunyu, amavuta n'ibinure..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 36. Inyigisho zerekeye uko umuntu yagira ubuzima bwiza..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 37. Inyigisho zerekeye kwihanganira guhangayika..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 38. Imyifatire myiza y'umugongo ya kubuza kurwara umugongo...Yego | <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 39. Inyigisho zerekeye ububi bwo kunywa itabi..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 40. Inyigisho zatuma umulyango wawe ugira ubuzima bwiza.... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 41. Ibyerekeye umuvuduko w'amaraso yawe nicyo wabikoraho.. | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 42. Uko wakwitwara ngo ugire ubuzima bwiza..... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 43. Inyigisho wakwiga kugiti cyawe ngo ugire ubuzima bwiza.... | Yego <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 44. Inyigisho zerekeye uko umuntu yakwirinda indwara ya sida.....Yego | <input type="checkbox"/> | Oya <input type="checkbox"/> |
| 45. Ikindi wakwifuzaga ngo ugire ubuzima bwiza n'iki? | | |

.....

Urakoze cyane

Map of Rwanda illustrating various locations of research setting

