# PHYSICAL ACTIVITY PARTICIPATION AMONG ADULTS WITH HYPERTENSION IN MBABANE, SWAZILAND

**By**

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## ABSTRACT

Scientific studies have shown that chronic diseases of lifestyle (CDL) such as hypertension and diabetes mellitus are major causes of mortality and morbidity, accounting for about 60% of the disease burden globally. Available statistics for Swaziland indicate that hypertension and heart diseases are on the increase and are responsible for 33,540 and 3,146 cases per year respectively. Regular physical activity (PA) is widely recognised as a means for the primary and secondary prevention of CDL due to their multi-factorial beneficial effects on an individual's health. Therefore, the aim of this study was to determine PA participation among adults with hypertension in Mbabane, Swaziland and the extent to which they are encouraged to be physically active. A cross-sectional design, utilising quantitative methods was employed in the study and three validated standardised interview administered questionnaires were used to collect data from both hypertensive individuals and health professionals. A sample size of 422 hypertensive individuals and 72 health professionals was included in the study. Statistical Package for Social Sciences (SPSS) version 20 was used to analyse the data. Descriptive statistics were employed to summarise data and was expressed as means, standard deviation, frequencies and percentages. The Students't-test was used to compare mean age and PA. Chi-square tests were used to test for associations between categorical variables with significant levels set at 5% ($p < 0.05$). Blood pressure was classified into controlled ($\leq 140/\leq 90$ mmHg) and uncontrolled ($\geq 140/\geq 90$ mmHg). PA was dichotomised into active (> 600 MET-minute/week) and sedentary (< 599 MET-minute/week). BMI was classified as underweight (<18.5), normal (18.5-24.9), overweight (25-29.9) and obese (>30). The findings of the current study revealed that a considerable number of individuals with hypertension (53%) were physically inactive with poorly controlled blood pressure (57%). A statistical significance was found between mean age and PA (sedentary and active) ($P= 0.000 < 0.05$).


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The study also revealed that the perceived benefits of PA as reported by individuals with hypertension outweighed the perceived barriers. In addition, the majority of health professionals were found to be poor counsellors of PA (58%). Most health professionals informed their patients on becoming physically active but did not include important components of PA counselling such as the types of PA, intensity and duration. The common reasons for not including PA as part of the daily routine include: not my area of specialty and lack of time. These factors could significantly contribute to sedentary behaviour among hypertensive individuals in developing countries such as Swaziland. For this reason, an urgent need for PA promotion programmes which will motivate hypertensive individuals to participate in sufficient levels of PA as recommended by public health research has been established. The programmes should include educating health professionals on current trends in the promotion of PA. A combination of these approaches will help to reduce morbidity and mortality from cardio-vascular disease (CVD), in particular hypertension.

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**KEY WORDS**

BARRIERS

BENEFITS

CARDIO-VASCULAR DISEASE

CHRONIC DISEASES OF LIFESTYLE

HEALTH PROFESSIONALS

HYPERTENSION

MBABANE

PHYSICAL ACTIVITY

PHYSICAL ACTIVITY PARTICIPATION

SWAZILAND

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## DECLARATION

I declare that "Physical activity participation among adults with hypertension in Mbabane, Swaziland" is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

**Sharon MASONA**

**SIGNATURE: ……NOVEMBER 2013**

**WITNESS: ……**

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**Prof. Julie Phillips**

## DEDICATION

This thesis is dedicated to God Almighty. I also dedicate this work to the greatest gift of my life, my mother Lepha Masona for her continued prayers, support and encouragement throughout my studies. To my son Maphalo Jayden, I am sure you would have loved mommy to be home with you the past years but thank you for making that sacrifice. In addition I would like to say to my sister Marlene Masona, thank you for being my pillar of strength.

*God bless you!!*

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***May God bless you!***

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# CHAPTER ONE

# INTRODUCTION

## 1.1 INTRODUCTION

This study focuses on physical activity (PA) participation among adults with hypertension in Mbabane, Swaziland. The introductory chapter provides an overview of chronic diseases of lifestyle (CDL) globally, in Africa and Swaziland in particular with specific reference to hypertension and PA. In addition, the problem statement presented in this chapter highlights the inadequate attention that has been paid to CDL and the overwhelming burden of these diseases together with HIV/AIDS. The aim, objectives and significance of the study are also outlined in this section.

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## 1.2 RATIONALE OF THE STUDY

Chronic diseases of lifestyle such as hypertension, diabetes mellitis and cancer are a global public health problem with a growing trend in developing countries (Kelishadi et al., 2011; Yach, Hawkes, Linn, Gould & Hofman, 2004). As alerted by Booth, Scott, Gordon, Carlson and Hamilton (2000, pp. 775), "Our society and the world`s population is at war against a common enemy and that enemy is CDL". Historically, infectious diseases were the main cause of death globally, but as the world`s population is undergoing socio-economic changes, scientific evidence has described a global change in the disease pattern (Forrester, Cooper & Weatherall, 1998). As early as the 1990`s, a decline in infectious diseases and an escalation in CDL was reported, especially in developed countries. However, in Africa, a continent of 53 diverse countries with a population of 1 billion people has not been spared from the global tide of CDL (Alwan, 2011).

In this regard, emerging evidence now shows that the pattern of diseases in Africa in general and Sub-Saharan Africa in particular is also changing, with CDL such as cardio-vascular diseases (CVD) being responsible for mortality rates of about 11 % and 9.2% respectively (WHO, 2010; WHO, 1999). These findings have been confirmed by Sani (2007) and Addo, Smeeth and Leon (2007) who reported a general escalation in the prevalence of CDL, especially CVD in African countries. Damasceno et al. (2009) has pointed out that Hypertension is the most common CVD risk factor and therefore, a major public health problem globally.

Kaerney et al. (2005) estimated the global prevalence of hypertension in the adult population to be about 972 million. The majority of these hypertension cases (639 million) are found in developing countries. In addition, hypertension is predicted to be as high as 1.56 billion by the year 2025. Information with regard to the prevalence rates of hypertension in Sub-Saharan Africa is scarce, but the World Health Organisation (WHO) regional committee for Africa has reported that, more than 20 million people are affected, with national prevalence levels ranging from 25% - 35% (WHO AFRO, 2005). However, in a recent study conducted in Ghana, crude prevalence rates ranging from 25% to 48% were reported (Bosu, 2010). This shows that hypertension, once a rare condition in Sub Saharan Africa, now has become a major public health problem (Mafunda et al., 2006; Agyemang, 2006). It is no longer confined to affluent societies, nor does it only affect those who have consciously chosen unhealthy lifestyles (Strong, Mathers, Leeder & Beaglehole, 2005). Despite established scientific evidence which has clearly highlighted the fact that hypertension is highly preventable, hypertension has been identified as the leading risk factor for mortality, and is ranked as the third cause of increased disability-adjusted life-year (DALY) (Chockalingam et al., 2006). DALY is a measure of overall disability burden expressed as the number of years lost due to ill-health, disability or early death. It extends to the concept of potential years of life lost due to premature death, including equivalent years of healthy life lost by virtue of being in a state of poor health or disability (Boutayeb & Boutayeb, 2005). One DALY is considered to be one lost year of healthy life.

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The progression of hypertension is propelled by demographic, economic, and social factors, of which urbanisation, industrialisation, and globalisation are the main determinants especially in developing countries (Reddy, Shah, Varghese & Ramadoss, 2005). These factors have led to a global epidemiological transition (Yusuf, Reddy, Ounpuu & Anand, 2001).

Sub-Saharan Africa in particular is known to be entering this epidemiological transition (Omran, 2005). Epidemiological transition is the term used to describe the changes in the disease pattern associated with socio-economic and demographic development (Yusuf et al., 2001). Furthermore, this epidemiological transition is related to changes in the ways of living which brings about increased behavioral and biological risk factor levels in the population. Such risk factors include, changes from traditional to westernised diet, use of tobacco, harmful use of alcohol, high sodium intake as well as a large shift towards sedentary life (Sparling, Owen, Lambert & Haskell, 2000). For this reason, WHO (2010) has anticipated that CDL will account for 80% of the global burden of diseases, causing seven out of every ten deaths in developing countries by the year 2020, therefore becoming the number one cause of death in Africa by the year 2030 if no action is taken (WHO, 2010; Boutayeb & Boutayeb, 2005). In response to these public health alarms, WHO proposed a global framework for action on CDL namely: WHO Convention on Tobacco Control and the Global Strategy on Diet, Physical Activity and Health (WHO, 2003). In addition, WHO, in its action plan 2008-2013, has urged all African countries to plan the surveillance on modifiable risk factors correlated to these diseases. One of the objectives of the 2008-2013 action plan is to support cost effective strategies such as the use of physical activity (PA) in managing and preventing CDL such as hypertension. This has been supported by numerous studies which have established that hypertension is highly preventable through lifestyle modification (Gupta & Guptha, 2010; Hankinnson, 2008).

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Scientific evidence shows that PA can be used to promote health as well as treat physical and mental illnesses (WHO, 2010, Fagard & Cornelissen, 2007). In addition, Kruk (2007) and Booth et al. (2000) have recognised PA as a means for the primary and secondary prevention of CDL such as hypertension. This is due to the multi-factorial beneficial effects of PA on an individual's health and well-being. The evidence with regard to the intensity of PA which have beneficial effects on hypertension and the mechanism underlying this association is unclear and scant (Abramson & Vaccarino, 2002; Hu & Tian 2001; Hagberg et al., 2000). However, some scientific evidence have supported the effects of dynamic cardio-respiratory exercises in the treatment of hypertension and that accumulation of moderate PA on most, if not all days of the week, is recommended for the treatment of hypertension as well as for the prevention of prehypertension progressing to hypertension (Pescatello, Franklin, Fagard, Farquhar, Kelly & Ray, 2004; Chobanian et al., 2003). In more recent studies, Bronas & Leon (2009) reaffirm an inverse association between leisure time activity and development of hypertension by pointing out that lifestyle modification has a direct effect on the reduction of the incidence of hypertension and blood pressure levels.

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Despite this established evidence with regard to the link between PA and decreased hypertension, PA is now identified as the fourth leading risk factor for global mortality (WHO, 2004). In Africa, PA participation is becoming consistently low and the incidence of hypertension is on the rise (Guthold et al., 2011; Sobngwi et al., 2002). However, Kolt and Snyder-Mackler (2003) have alerted that individuals with chronic diseases such as hypertension often avoid exercises for fear of making their condition worse or over exerting themselves, yet these individuals are the ones that stand to benefit more from PA participation. In addition, Lorig (2003) has also established that individuals with hypertension are frequently faced with a number of challenges with regard to medical management, difficulty in maintaining life obligations and managing negative emotions such as fear and depression.

These factors might affect the patient's self-image and their ability to adopt and maintain the recommended levels of PA (Carter-Edwards, 2004). For this reason, the health care system should support these individuals with information about the benefits of PA and CDL, in particular hypertension (Whitlock, 2002).

The general global picture of CDL and the prevalence of physical inactivity outlined above has not spared Swaziland. The World Bank classifies Swaziland as a low to middle-income country ranked at 140 as of the year 2009. This is based on its per capita income which is estimated at US$2280. However, the country`s real growth rate of domestic product (GDP) has been deteriorating from a high of 9% per annum during 1986-1990 to an average of 2.4% in 2008. Moreover, Swaziland`s income distribution is markedly uneven, with a GINI index of 51%. Approximately 70% of Swaziland`s population live below the national poverty line. The country's labour force is estimated to grow at an average annual rate of 2.9%, whilst the growth in employment opportunities for both public and private sectors is 1.7%. The private sector accounts for 69% and the public sector 31% of total formal employment. The informal sector has consequently become the key sector absorbing most of the school leavers, unskilled and disadvantaged members of the Swaziland society. With this kind of economic situation, one cannot help but conclude that the health care system is financially strained especially with the double burden of diseases sweeping across Swaziland.

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Swaziland`s health system is comprised of both private and public health facilities which are spread around the country. The country's health care delivery system is divided into three main levels namely primary, secondary and tertiary levels (Zwane, 2005). The primary level comprises of clinics, community based health workers and outreach services, and is the first level of contact. The second level of health care is the secondary level comprising of health care centres which offer out-patient and in-patient services serving as referral points for the primary level facilities.

The tertiary level comprises of regional hospitals, specialised hospitals and the national referral hospitals. Even though Mbabane Government Hospital is the only referral hospital in the country, it also attends to walk-in patients on a daily basis. The health care programmes in Swaziland are coordinated at the central level by the Ministry of Health and at regional level by the regional health management teams. Most of the CDL are managed at primary and tertiary level of health care (Ministry of Health, 2007).

According to the Swaziland National Non-communicable Diseases Strategic Plan 2012-2017, there has been an increase in the prevalence of CDL since the 1990`s in Swaziland. Sketchy evidence suggests that the country is experiencing an epidemiological transition that has resulted in a serious challenge for CDL, particularly hypertension, diabetes mellitus and cancer. However, a more recent survey conducted by STEPS (2007) has shed more light on the significance of the burden of CDL in Swaziland. The mortality rate from CDL, led by CVD such as hypertension (12%) is unacceptably high (Ministry of Health, 2007). The annual statistics report for the Ministry of Health (2007), has also reported that out-patient data from all health facilities reveal that hypertension and heart diseases were responsible for 33,540 and 3,146 attendances respectively. A total of 43% of hypertensive cases were diagnosed in primary health care facilities, whereas 39% of heart diseases were diagnosed in tertiary health care. STEPS (2007) has attributed these findings mainly to the high rates of obesity, smoking, alcohol consumptions and physical inactivity in the Swazi population. For this reason, Swaziland as a country, through the Ministry of Health has responded to the burden of CDL by establishing the National Non-communicable disease (NCD) programme with focus on CVD, diabetes, cancer and other CDL related conditions. In addition, the Ministry of Health is currently developing a National NCD Policy and a Strategic Plan for 2012-2017 (Ministry of Health, 2007). This is in order to direct the implementation of CDL prevention, management and control strategies.

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These strategies will usher in a serious need for up-to-date scientific data and public health principles. Therefore, quantifying levels of PA among individuals with hypertension will help attract the needed attention in tackling the burden of hypertension in Swaziland. The results of this study will facilitate planning and implementation of interventions for the prevention and management of hypertension, by adding new scientific information to the existing one. A need for the involvement of health professionals has not been strongly pointed out in the drafts of the National NCD Strategic Plan and the National NCD Policy, yet health professionals as pointed out by Whitlock (2002) have a significant role to play in the management and prevention of CDL as they are believed to have scientific knowledge with regard to PA. Therefore, hypertension should not be treated as an individual problem, but all efforts should be societal in nature. Urgent involvement of health professionals in tackling the problem of hypertension and PA is necessary. In addition, Strategies aimed at the prevention and management of hypertension will also call for strong political involvement especially that, just like any other developing country, Swaziland is currently battling with communicable diseases such as TB and HIV and the government has limited resources and health budgets (Addo et al., 2007).

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## 1.3 PROBLEM STATEMENT

WHO has continued to highlight the importance of CDL globally, especially in developing countries. Based on personal observation by the researcher, there has been an increase in the number of individuals with hypertension attending specialised hypertensive clinics at Mbabane Government Hospital in Swaziland. The increase in the number of individuals with hypertension became evident following the abolishment of hospital fees for senior citizens (over 60 years). On the other hand, the Swaziland National Health Policy (2007) has pointed out that CDL have received inadequate attention, given the overwhelming double burden of disease from CDL and HIV/AIDS that is prevailing in Swaziland. A general insight into CDL in Swaziland has also revealed limited literature.

The first study to gather baseline epidemiological data on the prevalence of CDL in Swaziland was conducted by WHO, through STEPS in 2007 and the results showed a high prevalence in CDL, particularly diabetes mellitus and hypertension, and a reduction in PA in the general population was also reported. From these results, interventions aimed at curbing these CDL have been put in place, but the focus is on primary prevention. The aims of these interventions are to provide the general public with education on risk factors by means of the media and social mobilisation (Swaziland National NCD Strategic Plan, 2012). This kind of approach might not address the specific needs of individuals who are already affected by CDL, in particular hypertension, leading to a continuation of the trend of physical inactivity and exposure to other risk factors. For this reason, the study is aimed at determining PA participation among adults with hypertension in Mbabane, Swaziland and the extent to which health professionals encourage them to be physically active. In addition, factors associated with PA and the benefits of, and barriers to PA participation will also be analysed.

## 1.4 RESEARCH QUESTION

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Are adults with hypertension in Mbabane, Swaziland participating in physical activity and are they encouraged to be physically active by health professionals?

## 1.5 OVERALL AIM

The overall aim of this study was to determine the physical activity participation among adults with hypertension in Mbabane, Swaziland and the extent to which they are encouraged to be physically active by health professionals.

## 1.6 SPECIFIC OBJECTIVES

(i) To determine physical activity participation among individuals with hypertension in Mbabane, Swaziland.

(ii) To determine factors associated with participation in physical activity among adults with hypertension in Mbabane, Swaziland.

(iii) To determine perceptions regarding the benefits of, and barriers to, participation in physical activity among adults with hypertension in Mbabane, Swaziland.

(iv) To determine health professionals' physical activity counselling practices in the management of adults with hypertension in Mbabane, Swaziland.

## 1.7 SIGNIFICANCE OF THE STUDY

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The WHO (2004) has earmarked physical activity as a strategy in the reduction of the prevalence of CDL such as hypertension. However, most individuals and health professionals do not seem to realise the benefits related to being physically active (Colberg, 2008). It is in this regard that the researcher has found a need to determine the levels of PA participation among adults with hypertension, perceptions regarding the benefits of, and barriers to PA participation as well as health professionals' PA counselling practices in the management of individuals with hypertension in Mbabane, Swaziland. The results of this study will help to inform individuals with hypertension, health professionals and policy makers on the need to utilise PA as a cost effective strategy in managing and preventing hypertension as recommended by WHO (2004). In addition, the results will also establish a foundation for evidence-based practice. Understanding the causes of inactivity among individuals with hypertension may help in developing effective PA programmes leading to accumulation of adequate PA of 30 minutes or more of moderate intensity PA on most, preferably all days of the week as recommended by public health.

## 1.8 DEFINITION OF KEY WORDS

**Barriers:** One's opinion of the tangible and psychological costs of the advised or recommended action (Glanz, 1998).

**Benefits:** One's opinion of the efficacy of the advised or recommended action (Glanz, 1998).

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

**Chronic diseases of lifestyle/Non- communicable diseases:** These are diseases which are classified as non-infectious, as they cannot be transmitted onto others, and include diseases such as cancer, diabetes mellitus, hypertension, and cardiovascular diseases. In this study non-communicable diseases will mainly refer to hypertension and diabetes (Tsolekile, 2007).

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**Controlled hypertension:** Controlled hypertension is defined as pharmacological treatment of hypertension associated with an average systolic blood pressure of < 140 mm Hg and an average diastolic blood pressure < 90 mm Hg (Chobanian et al., 2003).

**Counselling practices:** The process of giving professional advice and counsel, recommending a course of action, or correcting deficiencies in the performance of a task or function (Workforce Development Definitions, 2009).

**Exercise:** is defined as a physical activity that is planned, structured, repetitive, with the objective of improving the general physical fitness through increased strength, endurance and flexibility (Durstine & Moore, 2003).

**Health professional:** A person trained to work in any field of physical or mental health (Random House Kernerman Webster's College Dictionary, 2010).

**Hypertension or High blood pressure:** A sustained elevation of optimal or normal blood pressure levels that equals or exceeds 140 mmHg systolic and 90 mmHg diastolic. It is considered a syndrome with multiple phenomena in which arterial pressure stays high for an extended period of time (McPhee at al., 2003).

**Lifestyle:** Lifestyle comprises the aggregate of an individual's actions and behaviours of choice, which can affect health-related fitness and health status (Bouchard, Shephard & Stephen, 1993).

**Mbabane:** Capital city of Swaziland (Swaziland Country Profile, 2012).

**MET- minutes/ week**: The Metabolic equivalent (MET) - minutes per week is a unit used to measure the energy expenditure during a physical activity. It is calculated as the MET intensity multiplied by the minutes for each activity over a seven day period (Craig et al., 2003).

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**Obesity and overweight:** They are defined as abnormal or excessive fat accumulation that presents a risk to health. A measure of obesity is the body mass index (weight in kilograms divided by the square of his height in meters). A person with a BMI of 30 or more is generally considered obese, while BMI equal to or more than 25 classify the person as overweight (WHO, 2006b).

**Physical activity participation:** Taking part in any bodily movement which is associated with contraction of skeletal muscles that substantially increases energy expenditure (Hankinson, 2008).

**Physical inactivity:** Lack of physical activity and is an independent risk factor for CDL (WHO, 2010).

**Sedentary:** The original meaning of the word "sedentary" is related to the higher propensity to be sitting down without performing any physical activity that requires energy expenditure (Varo et al., 2003).

**Swaziland:** Swaziland is a small, landlocked country in Southern Africa covering an area of about 17,363 sq. km (Swaziland National Health Policy, 2007).

**Uncontrolled hypertension:** Uncontrolled hypertension is associated with an average systolic blood pressure of > 140 mmHg and a diastolic blood pressure of > 90 mmHg (Chobanian et al., 2003).

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## 1.9 ABBREVIATIONS

**ACSM:** American College of Sports Medicine

**AIDS** Acquired Immune-Deficiency Syndrome

**BHS:** British Hypertension Society

**BMI:** Body Mass Index

**BP:** Blood pressure

**CDC:** Center for Disease Control and Prevention

**CDL:** Chronic diseases of lifestyle

**CVD:** Cardiovascular diseases

**EBBS:** Exercise Benefits Barrier Scale

**HIV** Human Immuno-Deficiency Virus

**IPAQ:** International Physical Activity Questionnaire

**MET:** Metabolic Equivalent of Task

**MMHG:** Millimeters of mercury

**MMOL:** Milli mole

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**NCD:** Non-Communicable Diseases

**PA**: Physical activity

**PAEI:** Physical Activity Exit Interview

**SD:** Standard Deviation

**SPSS**: Statistical Packages for Social Sciences.

**TB** Tuberculosis

**USA:** United States of America.

**USPSTF:** The United States Preventive Services Task Force

**UWC:** University of the Western Cape

**WHO:** World Health Organisation

## 1.10 THESIS OUTLINE

**Chapter One** comprises of the introduction and the background to the study. The aim, the objectives and the significance of the study are also highlighted.

**Chapter Two** entails a review of literature related to CDL globally, in Africa and Swaziland in particular. The role of physical activity in the prevention and management of hypertension as well as the role of health professionals in promoting physical activity is outlined. Additionally, the benefits of and barriers to physical activity are also reviewed.

**Chapter Three** describes the methodology that was utilised to perform this study including the research setting, study design, population and sampling, study instrument, study procedures, data analysis methods and the ethical considerations.

**Chapter Four** presents the results of the study including the demographic profile of the study sample, the prevalence of uncontrolled hypertension and the physical activity participation levels of the participants. The socio-demographic factors influencing physical activity participation among individuals with hypertension and physical activity counselling practices of health professionals are also presented. Benefits of and barriers to physical activity participation, the reasons for failure to counsel patients on physical activity by health professionals are also outlined.

**Chapter Five** discusses the results in comparison with similarities and differences from previous similar studies and explains the gaps in line with physical activity levels and counselling practices, while **Chapter Six** is a summary, conclusion as well as recommendations that are based on the findings of this study.

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# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 INTRODUCTION

Clear evidence from research worldwide has continuously established that hypertension is a public health problem in both developing and developed countries. Literature has also shown the benefits of the inclusion of physical activity (PA) in both the management and prevention of hypertension as well as the role of health professionals in raising awareness and promotion of PA. Therefore, this narrative literature review will highlight the prevalence of hypertension globally and in Africa in particular, the risk factors associated with hypertension, the benefits of and barriers to PA, the role of PA in both the prevention and management of hypertension and lastly, the current practices regarding management and prevention of hypertension.

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## 2.2 DEFINING HYPERTENSION

In medical terms, hypertension is also known as high blood pressure and a clear distinction between secondary and primary hypertension has been made (Abdullahi & Amzat, 2011). Secondary hypertension results from other medical conditions such as chronic kidney diseases, renal artery stenosis or adrenal tumours, whereas primary or otherwise known as essential hypertension has no specific known underlying cause and accounts for about 95% of all cases of hypertension (Rosendorff et al., 2007). According to the Seventh Joint National Committee on Prevention, Detection, Evaluation and Treatment of High blood Pressure (Chobanian et al., 2003), blood pressure classification for adults should be based on two or more seated blood pressure readings performed during at least two office visits. Based on these guidelines, the classification of hypertension has been provided.

Normal blood pressure is defined as systolic blood pressure of ≤120 and a diastolic blood pressure of ≤ 80 mm Hg. Systolic blood pressure of 120–139 mm Hg or diastolic blood pressure of 80–89 mm Hg is classified as pre-hypertension. Individuals in the pre-hypertensive group have been reported to have increased risk for progression to hypertension (Liszka, Mainous, King, Everett & Egan, 2004). Hypertension is defined as systolic blood pressure ≥140 mm Hg or diastolic blood pressure ≥90 mm Hg or when there is reported use of anti-hypertensive medication (Fagard & Cornelissen 2007; Mahmood, Prakash, Srivastava, Zaidi & Bhardwal, 2013). The prescription of anti-hypertensive drugs is aimed at controlling blood pressure to optimum levels. Controlled hypertension is defined as pharmacological treatment of hypertension associated with an average systolic blood pressure of < 140 mm Hg and an average diastolic blood pressure of < 90 mm Hg, while uncontrolled hypertension is associated with an average systolic blood pressure of ≥ 140 mm Hg and a diastolic blood pressure of ≥ 90 mm Hg (Chobanian et al., 2003). Hypertension is further divided into stages; stage one hypertension comprises individuals with systolic blood pressure of 140–159 mm Hg or diastolic blood pressure of 90–99 mm Hg. Stage two includes individuals with systolic blood pressure of ≥160 mm Hg or diastolic blood pressure of ≥100 mm Hg as outlined in Table 2.1.

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**Table 2.1: Classification of blood pressure for adults**

| BP Classification | Systolic BP (mm Hg) | | Diastolic BP (mm Hg) |
|---|---|---|---|
| Normal | ≤ 120 | **and** | ≤ 80 |
| Pre-hypertension | 120–139 | **or** | 80–89 |
| Hypertension | ≥140 | **or** | ≥90 |
| Stage 1 hypertension (Moderate) | 140-159 | **or** | 90-99 |
| Stage 2 hypertension (Severe) | ≥160 | **or** | ≥100 |

BP : Blood pressure

## 2.3 GLOBAL PREVALENCE OF HYPERTENSION

Hypertension is a major public health concern globally affecting both developed and developing countries and is the most common cardio-vascular disease (CVD) risk factor (Damasceno et al., 2009). The magnitude of the burden of hypertension varies around the world and blood pressure disproportions also exist within different settings depending on the social economic status (Grotto, Huerta & Sharabi, 2008). Despite the impact of hypertension being widely reported in various parts of the world, very limited literature has been compiled with regard to its prevalence and absolute burden globally (Wolf-Maier et al., 2003). An analysis of the global burden of hypertension in the year 2000 revealed that more than 36%, nearly 1 million of the world's adult population had hypertension, and the proportion is expected to increase by 29% by the year 2025 (Kearney et al., 2005). Nearly two thirds of the disease burden of hypertension occurs in developing countries (Hajjar, Kotchen & Kotchen, 2006). In addition, Kearney, Whelton, Reynolds, Whelton & He (2004) have alerted that the prevalence of hypertension in developing countries seem to have increased in recent years, while it has remained stable or decreased in developed countries. Data from a recent systematic review revealed that in most countries and different regions of the world, between one quarter and one-third of the population, both men and women, have elevated blood pressure (Kearney et al., 2004). The results from this analysis suggest that, the global prevalence of hypertension is approximately 30%. Furthermore, in as much as there are variations in the prevalence of hypertension in different parts of the world, the overall results from different studies are dependable, ranging from 30%-36%.

### 2.3.1 DEVELOPED COUNTRIES

Despite evidence suggesting that there is a decline in the burden of hypertension in developed countries, hypertension has continued to be a public health concern in these countries (Kearney et al., 2004). In this context, the prevalence rate of hypertension in developed countries is reported to be between approximately 20% and 50%.

In a study conducted in 6 European countries, the prevalence of hypertension was highest in Germany (55%), followed by Finland (49%) (Wolf-Maier et al., 2003). The results from the same study revealed that the United States had the lowest prevalence rates of 28%. However, Hagberg et al. (2002) findings indicated that more than 50 million Americans and more than 50% of America`s population over the age of 60 years have hypertension. According to Bronas and Leon (2009), because blood pressure tend to increase with age, the number of people with hypertension is likely to rise drastically as the United States population continues to age. The Centre for Disease Control and Prevention (CDC, 2003) has pointed out that approximately 950,000 Americans die from CVD each year. Additionally, 31 million Americans are currently living with some form of CVD. The age-adjusted rate of hypertension is 30.9%, rates by gender being 30% for men and 31% for women (Cheung, Ong, Man, Lam & Lau, 2006). Moreover, an estimated 69 million adults over the age of 20 years in the United States have pre-hypertension, with the majority of these individuals being women and this is of great concern because it is associated with 1.5 to a 2 fold increase in the risk of a major CVD event in individuals under the age of 60 years (Go, 2013; Wolf-Maier et al., 2003; Hernandez-Hernandez, Armas-Padilla, Armas-Hernandez & Velasco, 2000). Chockalingam, Campbell & Fodor (2006) have also reported a general decline in mortality and morbidity rates from hypertension in many other developed countries as compared to developing countries. This is attributed to relatively high levels of awareness and treatment (Kearney et al., 2004).

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### 2.3.2 DEVELOPING COUNTRIES

The World Bank defines countries with gross national income per head of US$12 195 or less as developing countries and more than 80% of the world`s population live in developing countries (Ibrahim & Damasceno, 2012). While the prevalence of hypertension is reducing in developed countries, the prevalence of hypertension has significantly increased in the past few decades in developing countries (Ibrahim & Damasceno, 2012).

Extensive epidemiological studies have shown that hypertension is one of the common CVD in Africa and that it becomes much more prevalent with the aging of the population (Cappuccio et al., 2004). Almost three-quarters of individuals with hypertension (639 million people) live in developing countries where health resources are very limited with very low levels of awareness which leads to poor blood pressure control (WHO, 2005; WHO, 2002). The existing prevalence in many developing countries, especially among people living in urban areas is said to be already as high as those seen in developed countries (BeLue, 2009; Vorster, 2002; Khor, 2001). However, data available with regard to the prevalence of hypertension in developing countries is usually obtained from self-reports by individuals which may lead to misdiagnosis thereby giving a wrong picture about hypertension in developing countries such as Africa. To this effect, international organisations such as the WHO (2004) have encouraged developing countries, including those in Sub-Saharan Africa, to strengthen the surveillance and standardise data collection methods (Guthold et al., 2011; Hankinson, 2008). The WHO`s recent update has highlighted that hypertension has remained the most important CVD, labelled as the seventh contributor to premature death in developing countries (WHO, 2009; Sani, 2007; Deepa, Shanthirani, Pradeepa & Mohan, 2003).

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In Sub-Saharan Africa, hypertension is a widespread problem with huge economic importance because of its high prevalence, poor diagnosis, and the severity of its complications (Opie & Seedat, 2005)**.** Several studies have confirmed the differences in blood pressure levels between rural and urban areas throughout Sub-Saharan Africa (Opie & Seedat, 2005). This increase is associated with social transformation brought about by adoption of westernised lifestyles and industrialisation sweeping across developing countries (Olutayo & Akanle, 2009; Fezeu et al., 2010). WHO projections suggest that mortality rates from hypertension is likely to continue its rapid escalation in developing countries if no control measures are put in place (WHO, 2002b).

The prevalence of hypertension in Sub-Saharan Africa is therefore likely to be of momentous consequences as very few people will get treatment and control is likely to be very low (Addo et al., 2007).

According to the Ministry of Health of Swaziland, despite the country having the highest HIV and AIDS prevalence rates in the world (36%), CDL, especially hypertension, have also appeared to be on the increase, posing significant challenges to the health system of the country (Swaziland Ministry of Health, 2007). Therefore, there is an urgent need for the development of effective interventions for the prevention, detection, treatment and control of hypertension in Sub-Saharan African countries such as Swaziland (Addo et al., 2007). This is supported by Chockalingam et al. (2006), who have emphasised the significance of awareness, prevention, treatment and control of hypertension if the battle against CVD is to be won.

The relationship between blood pressure and the risk of cardio-vascular events is continuous and consistent. Recent studies have clearly shown that untreated hypertension is a risk factor for myocardial infarction, heart failure, stroke, blindness, kidney disease and metabolic syndrome (Tee et al., 2010, WHO/ISH, 2003). It has been shown that every 2 mm Hg rise in systolic blood pressure is associated with a 7% increased risk of mortality from ischaemic heart disease and a 10% increased risk of mortality from stroke (Verdecchia, 2000). People who have hypertension are usually unaware that they have the condition hence the term “silent killer” and because of this, hypertension is usually under-diagnosed or inadequately treated resulting in extensive target-organ damage and premature death (Papazafiropoulou et al., 2011). The Seventh Joint National Committee on Prevention, Detection, Evaluation and Treatment of High blood Pressure (2003) has further warned that death from both ischemic heart disease and cerebral vascular accidents increases progressively and directly from blood pressure levels as low as 115/75 mm Hg and doubles with each increase of 20/10 mm Hg and people who are classified as pre-hypertensive have double the risk of developing hypertension.

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In addition, longitudinal data obtained from the Framingham Heart Study has indicated that systolic blood pressure values in the range 130 to 139 and diastolic blood pressure in the range of 85 to 89 mm Hg is associated with more than two-fold increase in relative risk from CVD compared with those with blood pressure levels below 120/ 80 mm Hg (Vassan et al., 2001).

## 2.4 RISK FACTORS

The underlying causes for hypertension are unknown, however the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High blood Pressure (2003) has identified non-modifiable risk factors such as genetic, race, age and gender as factors associated with its occurrence. However in most cases, hypertension has been reported to result from a complex interaction of these factors together with environmental and demographic factors (Kunes & Zicha, 2009; Oparil, Zaman & Calhoun, 2003). Recent studies have found that the genetic contribution to blood pressure variation, range from 30% to 50% (Timberlake, O'Connor & Parmer, 2001). Hypertension has also been found to be more prevalent in different races. The prevalence is particularly common among blacks and it often develops at an earlier age than it does in the white population (Tee et al., 2010). The risk of hypertension is also known to increase with age. Research has demonstrated that age plays an important role in increasing blood pressure values, especially systolic blood pressure (Hanon, 2009). Scientific evidence from a number of international studies in almost all populations with diverse geographical, cultural, and socio-economic characteristics has shown that there is a strong relationship between hypertension and advancing age (Al-Nozha et al., 2007). The association between increasing age and increasing systolic blood pressure is thought to reflect the length of time people are exposed to modifiable risk factors (Bronas & Leon, 2009). In terms of gender, hypertension is higher among males until the age of 45 years, the prevalence of hypertension in both genders from age 45 to 64 years is similar, after that hypertension becomes much more common among women. The effects of menopause are attributed to the high prevalence of hypertension in women (Reckelhoff, 2001).

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In addition to the above outlined risk factors, WHO has pointed out that behaviour and lifestyle-related factors put people at a higher risk of developing high blood pressure and these habits among others include: high intake of salt, low intake of potassium, obesity, high intake of alcohol, smoking as well as physical inactivity (BeLue et al., 2009; WHO, 2004). Derman et al. (2007) has also pointed out stress as a risk factor for hypertension. The American Heart Association has further considered diabetes mellitus and its pre-cursor condition, abnormal glucose metabolism due to insulin resistance, as seen especially in the metabolic syndrome a risk factor. It has also been proven that a majority of individuals with diabetes have a chance of developing hypertension (Chobanian et al., 2003). On the other hand, having blood pressure ranging from 120 - 139 / 80 - 89mm Hg is considered to be a potential risk factor for developing hypertension (Liszka et al., 2005). Likewise, recent studies have also shown that medication such as Anti-retroviral Therapy (HAART) is implicated as a cause of lipodystrophy, dyslipidaemia and insulin resistance that may be associated with an increase in the incidence of hypertension (Sani, 2007).

In a survey conducted in Swaziland by STEPS (2007), the results showed high rates of exposure to some of the risk factors of hypertension. In this survey, it was found that 7.9% (male/females) of the population was smoking tobacco. In addition, about 25% of men and 21% of women reported that they did not regularly consume fruit or vegetables which are a good source of potassium. With regard to alcohol, 42% of women and 36% of men reported consuming alcohol on a weekly basis. Obesity was found to be more common in women than men averaging 27% in women of all age groups and 25% in men. Physical inactivity was very common in the youngest age group 25-34 years (32% in women and 40% in men). Physical inactivity is predominantly as a result of changes in the environment and an increase in labour-saving technology which has reduced the demand for manual work (Sobngwi et al., 2002).

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## 2.5 PREVENTION AND MANAGEMENT OF HYPERTENSION

Blood pressure can be lowered by both pharmacological and non-pharmacological means but much emphasis is placed on lifestyle measures and drug management is just an add-on (Chobanian et al., 2003: Kaplan, 2006). There is a wide range of anti-hypertensive medications that can be prescribed to manage hypertension. For this reason, the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High blood Pressure (2003) has formulated a protocol to guide clinicians in treating and managing hypertension. Five pharmaceutical agents have been identified in controlling blood pressure and these include agents such as thiazide diuretics and beta-blocking agents, dihydropyridine calcium channel blockers (CCB), angiotensin converting enzyme (ACE) inhibitors, and angiotensin receptor blockers (ARB) (Chobanian, 2003). According to the British Association of Hypertension, more than two thirds of hypertensive individuals cannot be controlled on one agent and will require two or more anti-hypertensive agents selected from different drug groups (Cushman et al., 2002). However, even in combination therapy, anti-hypertensive agents are mainly for lowering elevated blood pressure rather than eliminating the risks of developing CDV and can cause adverse reactions, adverse events and unwanted biochemical changes (Costa, 2002). Since the final goal of treatment is not that of normalising blood pressure, but that of reducing as much as possible the global cardio-vascular risk in hypertensive individuals, lifestyle modification can play a significant role in the management and prevention of hypertension (Gupta & Guptha, 2010).

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Substantial amount of evidence has reinforced recommendations and the concept that lifestyle modification can reduce the incidence of hypertension and blood pressure levels in patients with established hypertension (Appel et al., 2003). The lifestyle interventions include regular PA, dietary modification and weight loss, stress management, cessation of smoking and reduced intake of alcohol (Derman et al., 2009; JNC-7, 2003). According to Huang, Duggan and Harma (2008), lifestyle modification is indicated for all patients with hypertension, regardless of drug therapy, because it may reduce or even abolish the need for anti-hypertensive drugs.

Therefore, all individuals with high blood pressure and those with borderline or high normal blood pressure should be given advice about lifestyle modification (Williams et al., 2004). In normotensive individuals, including those with pre-hypertension, lifestyle modification has the potential to prevent hypertension and more importantly to reduce blood pressure and lower the risk of blood pressure related clinical complications (Gupta & Guptha, 2010). In addition, lifestyle modifications can serve as a first line treatment before the start of drug therapy and as an adjunct to drug therapy in individuals already on medication. Hypertensive individuals who successfully control blood pressure through antihypertensive drugs, lifestyle modification such as PA participation can facilitate drug therapy provided their lifestyle modifications are maintained (Gupta &Guptha, 2010).

With regard to nutrition modification, public health approaches recommend lowering sodium content or caloric density in food supplies. He and MacGregor (2004) have reported a strong relationship between excess sodium intake and hypertension. It is known that a reduction in sodium intake can also help reduce blood pressure levels in patients with hypertension. In addition, it is also known that a daily restriction of 100 mmol of sodium intake during the first 55 years of life could result in a 16% lifetime reduction in mortality from coronary artery disease, a 23% reduction in mortality attributable to stroke, and a 13% reduction in death from all causes . The recommendation is that patients with hypertension should reduce sodium intake to 3 g or less per day. For this reason, other studies have recommended the use of these approaches as an adjunct to pharmacotherapy in patients with hypertension (Gupta & Guptha, 2010). On the other hand, some clinical trials have also suggested that increasing dietary potassium by approximately 2100 mg (54 mmol) per day can reduce systolic blood pressure by 4-8 mm Hg in individuals with hypertension and 2 mm Hg in normotensive individuals (Haung et al., 2008).

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Moderate alcohol consumption has been known since ancient times to have protective health benefits including a lower risk of coronary artery disease, whereas heavy consumption of alcohol was found to have adverse consequences on cardio-vascular health, leading to cardiac muscle disorders, cardiac arrhythmias, hypertension, cerebro-vascular accidents and is attributed to anti-hypertensive drug resistance (Zakkari, 1997). However, evidence for cardio-vascular benefits of light drinking has been challenged by a recent meta-analysis (Mancia et al., 2007). Emerging evidence shows that all levels of alcohol intake increase blood pressure (Haung et al., 2008). To this effect, Dickinson et al (2006) has reported that reducing alcohol consumption can lower systolic blood pressure by an average of 3.8 mm Hg in patients with hypertension.

Smoking is one of the most important risk factors for hypertension and a cause of major morbidity and mortality. Scientific evidence to demonstrate that cigarette smoking causes various adverse cardio-vascular events emerged as early as in the 1990`s (Menotti et al., 1996). This finding has been reinforced by the findings of a more recent study which have reported that smoking causes an immediate increase in blood pressure and heart rate that persists for more than 15 minutes after one cigarette and that people who smoke show higher ambulatory blood pressure levels than non-smokers (Mancia et al., 2007). Papathanasiou et al. (2012) has also found that smoking reduces the capacity of the circulatory system which leads to lower exercise tolerance, an acute increase in blood pressure as well as elevated heart rate. This forces muscle cells to switch to an inefficient metabolic process that hampers exercise and prompts the accumulation of lactic acid within the cells.

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Recent evidence indicates a direct association between blood pressure and body weight (Appel et al., 2006). According to Wamala, Karyabakabo, Ndungutse and Guwatudde (2009), most individuals with hypertension are usually overweight or obese. On average, a rise of systolic blood pressure of 2-3 mm Hg and diastolic blood pressure of 1-3 mm Hg is seen for each 10-kg increase over normal body weight (Daly et al., 2008). Therefore, loss of excess weight can reduce both systolic and diastolic blood pressure levels (Mancia et al., 2007).

This reduction has been reported even in obese individuals with hypertension who moderately lose weight as low as 4.5 kgs. Various researchers have recommended weight loss strategies such as change in diet and PA (Harsha & Bray, 2008; Chobanian et al., 2003). The ideal amount of weight loss for the treatment and prevention of hypertension as recommended by Appel et al. (2006) is attaining a BMI of < 25 kg/m$^2$. In addition, weight loss has been linked to a reduction of risk factors of CVDs and strokes. For this reason, Harsh and Bray (2008) have strongly advocated for long-term weight loss strategies. In this context, Appel et al. (2006) have recommended Dietary Approaches to Stop Hypertension (DASH) which is a diet rich in fruits, vegetables, and low-fat dairy foods and low in total saturated fat (Appel et al., 2006).

Mental stress has been mostly associated with hypertension by lay individuals. However, emerging evidence has indeed confirmed this idea and explained that exposure to stress increases sympathetic outflow, and repeated stress-induced vasoconstriction may result in vascular hypertrophy, leading to progressive increases in peripheral resistance and blood pressure (Derman, et al., 2009, Kaplan & Nunes, 2003). Therefore, stress management therapy in the management of elevated blood pressure levels, enhance the feeling of well-being, reduces muscular tension and improves sleep, which indirectly can reduce sympathetic stimulation (Bronas & Leon, 2009). These effects can in turn reduce systolic blood pressure from -2.3 mm Hg to +4.3 mm Hg and diastolic blood pressure from -2.0 mm Hg to +2.4 mm Hg (Rainforth et al., 2007). For this reason, Derman et al. (2009) has recommended stress management programmes in the management of hypertension.

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**Table 2.4: Relative reduction in resting blood pressure by different lifestyle modification**

| Modification | Systolic blood pressure reduction |
|---|---|
| Weight reduction | 5-20 mm Hg for every 10kg of weight lost |
| Adoption of DASH eating plan | 8-14 mm Hg |
| Dietary sodium restriction | 2-8 mm Hg |
| Physical activity (at least 30 minutes per day or most days of the week) | 4-9 mm Hg |

As highlighted above, reduction of blood pressure is associated with a wide range of benefits. In clinical trials, anti-hypertensive therapy has been associated with reduction in stroke incidence averaging 35%-40%, myocardial infarction, 20% to 25% and heart failure, more than 50% (Neal, MacMahon & Chapman, 2000). It is estimated that in patients with stage one hypertension, achieving a sustained 12 mm Hg reduction in systolic blood pressure over 10 years will prevent one death for every eleven patients treated (Chobanian et al., 2003). In the presence of CVD or target organ damage, only nine patients would require such blood pressure reduction to prevent a death (Ogden, He, Lydick & Whelton, 2000). Even just a reduction of 5 mm Hg in diastolic blood pressure over a period of five years has been associated with at least 34% less stroke and at least 21% less coronary heart disease. Furthermore, reductions of 7.5 mm Hg and 10 mm Hg are associated with a 46% and 56% decrease in the incidence of stroke and a 29% and 37% decrease in the incidence of coronary heart disease, respectively. Therefore, these findings underscore the significance of blood pressure control because even just a small reduction of blood pressure is associated with a reduction in morbidity and mortality from CVD (Kokkinos, Gianneloui, Manolis & Pittaras, 2009).

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## 2.7 ROLE OF PHYSICAL ACTIVITY IN THE PREVENTION AND MANAGEMENT OF HYPERTENSION

*"All parts of the body, if used in moderation and exercised in labours to which each is accustomed, become thereby healthy and well developed and age slowly; but if they are unused and left idle, they become liable to disease, defective in growth and age quickly*"(Kokkinos & Myers, 2009, pp.1637).

Undisputable results of several studies from as early as the 19th century have emphasised the use of regular PA in managing and preventing the occurrence of hypertension (Blair & Connelly, 1996; Lee et al., 1995). This concept has been re-enforced by global results carried out in a number of studies at the dawn of the 20th century (WHO, 2002; Lebrun et al., 2006). The association between physical inactivity and hypertension is so strong that a number of international organisations and agencies have recommended increased PA as a first line intervention for the prevention and management of patients with pre-hypertension and hypertension (Wallace, 2003). Warburton, Nicol, Shannon and Bredin (2006) have further reported that, while physical inactivity to a great extent contributes to the development of CDL and premature death, there is overwhelming evidence with regard to the effectiveness of regular PA in the primary and secondary prevention of hypertension. PA is predominantly a recommended strategy because of its multi-factorial effect on other CVD risk factors as well as it being a cost effective intervention with very few adverse side effects if undertaken according to scientifically proven guidelines (American College of Sports Medicine, 2004). PA has also been found to be an effective strategy in the cessation of smoking, alcohol consumption as well as weight reduction which are independent risk factors for hypertension (Huang et al., 2008). Therefore, regular PA can be a practical means to achieving various health gains, either directly or indirectly, through its positive impact on other major risks in particular, high blood pressure, high cholesterol, obesity, tobacco use and stress (Frantz, 2004).

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As defined by Hankinson (2008), any bodily movement produced by contraction of skeletal muscles that substantially increases energy expenditure is referred to as PA. This can be achieved through planned activity or accumulation of daily activities such as house chores (Halm & Amoako, 2009). Sparling et al., (2000) pointed out that even though the human species was designed for movement, within only a few centuries, PA has significantly decreased nearly to non-existent. In addition, occupations demanding PA are rare and generally restricted as compared to our ancestor's way of living which demanded much more PA. The reduction in the levels of PA is mainly due to innovations and other societal changes both at home and work places which has led to a more sedentary lifestyle in individuals (Sparling et al., 2000). Therefore, it has become increasingly clear that many of the chronic diseases we face today, including hypertension, have an association with the persistent sedentariness of modern life (Warburton et al., 2006). Even though the efficacy of PA in the reduction of elevated blood pressure is no longer questionable, the challenge now is to verify the amount and the frequency of exercise that have beneficial effects without a risk of detrimental side effects.

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Studies to compare the effects of different PA intensities have been done and low to moderate intensity PA has been found to be more effective in lowering blood pressure than PA of relatively high intensities (Haskell et al., 2007; Fagard & Cornelissen, 2005; American College of Sports Medicine, 2004; Chobanian et al., 2003). The preferred types of moderate PA as recommended by Mancia et al. (2013) and the American College of Sports Medicine (ACSM) (2007) are activities which incorporate large muscle groups and these activities include cycling, walking, jogging, swimming and aerobic dance. These types of PA if done regularly at a light to moderate intensity can bring about a reduction in blood pressure in 75% of individuals with hypertension and is therefore, a key component of lifestyle modification for the prevention and management of hypertension. Fagard and Cornelissen (2007) have also added that, these types of PA have a direct effect on both systolic and diastolic blood pressure in both normotensive persons and those with hypertension.

The reduction in blood pressure following exercise treatment as pointed out by Wallace (2003) ranges from 5-25 mm Hg for systolic and 3-25 mm Hg for diastolic blood pressure. Despite established evidence of the beneficial effects of moderate activities in the treatment of hypertension, others have remained unclear on the specific intensity that produces optimal blood pressure reduction (Hankinson, 2008; Warburton et al., 2006). On the other hand, Whelton et al. (2002) have argued that the favourable effect of PA on blood pressure is not totally dependent on the intensity but can sometimes be minimally influenced by factors such as the frequency, type and duration. The variations in the recommendations highlighted above underscore the need for more research to specify optimal PA intensity to reduce blood pressure. However, the use of cardiorespiratory mode exercise programmes of mild to moderate intensity has been a consistent finding in many well-controlled studies (Fagard & Cornelissen, 2005; Fagard, 2001; Kokkinos, Narayan, & Papademetriou, 2001). The general conclusion from most studies is that low to moderate intensity PA performed for 30 minutes or more on most days of the week successfully lowers elevated blood pressure levels (Haskell et al., 2007; Fagard & Cornelissen, 2005; Chobanian, 2003; WHO, 2003). These activities can readily be implemented for many populations of men and women (Pescatello et al., 2004). Moderate exercise programmes are also maintained easily and put less strain on the musculo-skeletal system especially in individuals who are not accustomed to vigorous PA (Hillman & Len Kravitz, 2013). Based on current trends, lifestyle modification that includes regular PA is often recommended to patients with hypertension as one of the first line treatments for lowering blood pressure, as well as improving overall risks for cardio-vascular events (Sharman & Stowasser, 2009). However, in patients with more severe types of hypertension the incidence of other co-morbidities is also high and interferes with the patient's ability to tolerate PA (Kokkinos et al., 2009). In such situations, the safety and effectiveness of PA in lowering the blood pressure has been questioned by some studies.

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To this effect, in a 16 weeks study conducted to compare blood pressure between the moderately physically active and the non-physically active groups with type two hypertension, after 16 weeks of moderate-intensity exercise training, resting systolic blood pressure was lowered by 7 mmHg and diastolic by 5 mm Hg (Kokkinos et al ., 2009). Blood pressure was reported to have continued to decrease as exercise training continued for another 16 weeks, allowing a 33% reduction in anti-hypertensive medication for the entire physically active group while the blood pressure in the non-physically active group increased slightly during the same period. These findings suggest that patients with more severe stages of hypertension can also safely tolerate PA of moderate intensity. Kahn et al. (2002) have therefore made it clears that the indication for PA depends on the patient's needs and capabilities. However for safety purposes, it is important to advise patients on exercise-related warning symptoms, such as chest pain or discomfort, abnormal dyspnoea, dizziness or malaise, which would necessitate medical supervision or evaluation (Fagard & Cornelissen, 2007). Even though PA is regarded as a cornerstone in non-pharmacological interventions, adherence is an essential element in achieving and maintaining the maximum benefits of PA in the management of hypertension (Whelton et al., 2002).

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As outlined above, CDL such as hypertension is a worldwide growing concern as PA levels of the populations keep reducing. The solution to this problem does not depend only in the prescription of anti-hypertensive drugs. PA could be an adjunct to drug therapy leading to better management of high blood pressure as compared to the medication therapy alone. Lifestyle modification strategies such as PA have been recommended as the first line of treatment for hypertension. These strategies should be strongly recommended because they are cost-effective, safe and side effect free. Developing countries in particular should be encouraged to adopt such strategies to reduce the costs directed at drug therapy, especially that allocated health budgets have to be shared between infectious diseases and the emerging CDL.

## 2.8 BENEFITS OF, AND BARRIERS TO, PHYSICAL ACTIVITY

Despite substantial scientific evidence with regard to the benefits of PA as indicated in the above section, there are many factors that can influence PA participation negatively (Lovell, El Ansari, & Parker, 2010; Reichert, Barros, Domingues & Hallal, 2007). Many people do not engage in sufficient levels of PA due to low perceived benefits and high perceived barriers to PA participation (Vaughn, 2009). WHO (2010) has added that apart from the well-known physical and mental health benefits of PA, regular PA can also improve the quality of life of individuals with chronic diseases such as hypertension. Therefore, to develop suitable and effective programmes, it is necessary to identify the factors that can be changed in order to improve PA participation (Trost, Owen, Bauman, Sallis & Brown, 2002; Dishman & Sallis, 1994). For this reason, studies with regard to barriers to PA have been conducted in countries such as the United States, Australia, Japan and Brazil (Reichert et al., 2007; Andajani-Sutjahjo, Ball, Warren, Inglis & Crawford, 2004). However, Reichert et al., (2007) have made it clear that the results from these studies differ mainly due to the differences in characteristics of the population under study. Parks, Housemann and Brownson (2003) have added that even within countries, the association between these barriers and the level of PA may vary according to the region in which individuals live.

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Lack of time is one of the most frequently reported barriers to PA in the general populations of both developed and developing countries (Kabanda & Phillips, 2011; Reichert et al., 2007). According to Grubbs and Carter (2002), the key motivational factors to participation in PA are the perceived benefits and perceived barriers. Within this context, Vaughn (2009) reported that individuals who perceived more benefits from being physically active and fewer barriers were in a better position to engage in PA than those who reported high perceived barriers and low perceived benefits. Understanding why individuals do not participate in sufficient PA is complex and multi-faceted, encompassing personal, interpersonal, environmental, and policy determinants (Lovell et al., 2010).

Some of the commonly reported barriers to PA in individuals with hypertension as reported by Kabanda and Phillips (2011) and Vaughn (2009) are: poor health status, lack of motivation, lack of time, fear of worsening the disease, cultural barriers, lack of family support and lack of awareness.

On the other hand, the factors that drive people to become physically active are considered as benefits. Pippin (2013) has defined perceived benefits for PA as a person's opinion of the value or usefulness of PA for improving physical and mental health. However, Nahas and Goldfine (2003) have reported that perceived barriers could be more influential on positive behaviour than perceived benefits. This finding is consistent with the findings of Lovell et al., 2010 who found in their study among university students, many benefits of being physically active and few barriers but the study sample remained inactive. The most important motivation for people to participate in PA in a healthy population is to maintain good health, to release tension and to get fit (Zunft et al., 1999). However, the perceived benefits tend to differ in different populations. According Grubb and Carter (2000) in their study on exercise behaviour among 147 undergraduate university students, regular PA habits were found to be related to physical performance and appearance. In a study conducted by Umuvandimwe (2011) in Rwanda among adults with hypertension, the commonly reported benefits of PA among hypertensive individuals were to feel better, weight management, feeling healthy, enhance physical mobility and to increase strength. Studies on the benefits of, and barriers to, PA among adults with hypertension in Mbabane, Swaziland are still lacking, which makes it difficult for policy makers and health professionals to design interventions which suit the current situation of PA. Therefore, this study aims to determine benefits of, and barriers to, PA participation that contribute to inactivity in adults with hypertension in Mbabane, Swaziland. The findings are aimed at assisting policy makers and health professionals in implementing protocols and guidelines which are culturally appropriate in the Swazi context.

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## 2.7 THE ROLE OF HEALTH PROFESSIONALS IN THE PROMOTION OF PHYSICAL ACTIVITY

Interventions that help people change unhealthy behaviours often require repetition for sustainability and the healthcare system has been found to be a natural setting for health behaviour counselling (Rehman et al., 2003). The United States Preventive Services Task Force (USPSTF, 2002) has pointed out that, the key element of clinical preventive services in health care settings is counselling. Health professionals play a unique and significant role in encouraging and influencing healthy behaviour, such as participation in PA, as they have access to patients and are an expected valued source of health information and recommendations (Whitlock et al., 2002). Van Doorslaer, Masseria and Koolman (2006) and Lucas, Schiller and Benson (2004) reported that health professionals especially those in general practice are an ideal group of people to identify sedentary individuals and give advice on PA as more than 80% of adults make consultations at least once a year. Moreover, these consultations increase with the aging process (McPhail & Schippers, 2012). This kind of untapped potential seen among health professionals has led to repeated outcries on incorporating PA counselling into routine clinical practice of health professionals (Briffa et al., 2006; Jacobson, Strohecker, Compton & Katz, 2005). In response to this, some developed countries have strengthened PA counselling in their clinical practice. The United States of America, through the USPSTF recommends counselling on prescription to promote regular PA, but many health professionals are said to be lacking the time and skills to provide counselling to hypertensive individuals (Halm & Amoako, 2008). However, after assessment of this intervention, the USPSTF found that few individuals receive PA counselling to help lower blood pressure and improve their health. Another example of a country practicing inclusion of PA in the management and prevention of hypertension is Australia, where PA is considered one of the first line treatment measures.

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Health practitioners in Australia play an important role in the management of individuals with hypertension by influencing and reinforcing appropriate lifestyle behaviours to achieve blood pressure control (Sharmana & Stowasserb, 2009). This approach is indicated for all patients with hypertension, regardless of drug therapy, because PA may reduce or even abolish the need for anti-hypertensive drugs which is an expensive way of management (Huang et al., 2008). It is important for the health professionals in Swaziland to emulate such practices by encouraging and supporting the patients and the population at large to increase their PA to sufficient level for health.

Despite health professionals valuing their role as promoters of healthy behaviours in their patients, there are a number of barriers to PA counselling which have been reported in literature by health professionals. The frequently reported PA counselling barriers identified include a lack of sufficient time, lack of financial incentives or reimbursement, lack of standard protocols, lack of a successful counselling role, lack of appropriate skills, tools and training (Petrella & Wright, 2000). This scenario could be true for Swaziland. In this regard, there is a great need for health professionals to be motivated by improving their knowledge of current PA recommendations and considering the development of tools to support individual assessment and PA counselling to suit individual circumstances. Therefore, there is need for researchers to determine the common barriers to PA counselling in order to enhance PA counselling among health professionals. Health professionals should have the knowledge of the benefits of PA and their interactions with anti-hypertensive drugs in order to influence their patients' PA to the recommended guidelines. In addition, all health professionals should give their hypertensive patients advice on PA to assist them in making well informed choices with respect to their health and management of hypertension.

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## 2.8 CONCLUSION

From the literature reviewed above, it is still evident that hypertension is a growing public health concern in Africa and the world at large. The industrialisation and westernised lifestyles are some of the risk factors highlighted above. It is also evident that a change to a more physically active lifestyle would be beneficial for the hypertensive individuals. Studies from different parts of the world have shown that there has been a significant increase in the incidence of hypertension in relation to the total population. Therefore, establishing data in Swaziland in particular is important for addition of scientific evidence and knowledge to the existing data, thereby positively influencing practices that promote PA in the prevention of CDL. In addition, significant role players need current and precise data about the prevalence, PA awareness and control of hypertension for sound planning of health policies.

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# CHAPTER THREE

# METHODOLOGY

## 3.1 INTRODUCTION

This chapter will outline the methods and procedures used to meet the research objectives of the study. A clear description of the research setting, study design, study population and sampling are given. In addition, the description of the study instrument and data analysis procedure is presented. Finally, permission and ethical clearance procedures are also detailed.

## 3.2 RESEARCH SETTING

The kingdom of Swaziland is ruled by a Monarchy, with executive and legislative powers vested in the King who is traditionally known as "Ingwenyama". Swaziland is a landlocked country sharing borders with Mozambique in the east and the Republic of South Africa in the south, north and west. It covers a surface area of about 17,363 sq. km (SNHP, 2007, Zwane, 2005) and has four distinct topographical regions which are the Highveld, Middleveld, Lowveld and the Lubombo plateau. In addition, the country is divided into four administrative regions namely: Hhohho, Shiselweni, Manzini and Lubombo regions. These regions are under an Administrator who is politically appointed. Furthermore, the country is sub-divided into 55 administrative centres known as Tinkhundla, under which there are 360 chiefdoms and towns. The Chiefs have control and authority of the country's land. According to 2010 estimates, Swaziland has a population of about 1.4 million people. The country is made up of a young population, the median age being 17.6 years (Zwane, 2005). The average life expectancy of Swaziland is 36.9 years in males and 33.4 years in females per 1,000 populations. Death rate is estimated to be 14.21 deaths per 1,000 populations while birth rates estimates stand at 26.16 births per 1,000 popula**ti**ons.

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The current study was conducted in Mbabane the capital city of Swaziland. According to the Swaziland Country Profile (2010), Mbabane is home to 74,000 people. The study was conducted at Mbabane Government Hospital which is the main referral hospital in Swaziland. The hospital has a bed capacity of approximately 500 beds. Besides being the main referral hospital offering consultation to both in and out-patients from all over the country, Mbabane Government Hospital is also open to walk-in patients on a daily basis and specialised hypertensive clinics are run once a week. In addition, the specialised clinic receives the biggest number of hypertensive individuals from both rural and urban areas who come for hypertension treatment and follow-up care. At the end of the year 2012, a total number of 7600 cases where recorded (Hospital records). The figure was derived at by considering an average of 640 patients seen per week and this figure represents both new and old cases. The new cases are seen once a week for blood pressure monitoring purposes. Once they have become stable, they are seen once every month for their medication refills.

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### 3.3 STUDY DESIGN

The research design was a cross-sectional study, utilising quantitative methods. According to Burns and Grove (2005), quantitative research uses numerical data and statistical analysis to obtain information about the world, giving the opportunity to describe and examine possible relationship among variables. Cross-sectional studies provide information on the situation of people in a population at a certain point in time and provide baseline data upon which other studies can be built (Olsen & George, 2004). To this end, there is generally limited information with regards to hypertension and PA in Swaziland hence this study helped to describe PA participation among individuals with hypertension, the associated factors, and the PA counselling practices of health professionals directly involved in their management.

## 3.4 STUDY POPULATION AND SAMPLE

The study involved two population groups. The first group is a group of hypertensive individuals who attend weekly treatment and follow-up care at Mbabane Government Hospital in Swaziland. The inclusion criteria for hypertensive individuals was all adult males and females aged between 18-65 years and are able to perform PA on a daily basis. On the other hand, individuals with orthopaedic or other medical conditions that hinder participation in normal daily PA were excluded. Furthermore, pregnant women as well as individuals under the age of 18 and those above 65 years were also excluded. A systematic random sampling technique was applied to sample individuals with hypertension whereby every 2$^{th}$ individual visiting the clinic was approached to participate in the study bearing in mind the inclusion criteria. As pointed out by Castillo (2009), systematic random sampling allows the researcher to add a degree of system into the random selection of subjects and ensures that the population is evenly sampled. Yamane's formula: $\boldsymbol{n = \frac{N}{1+N\,(e)^2}}$, was used to determine the minimum representative sample of 380 hypertensive individuals, where **n** stands for sample size; **N** for study population and **e** is the magin error which is equal to 0.05. To cater for non-response rate, the researcher decided to over sample with 42 cases. Therefore in total, 422 individuals with hypertension were approached for participation. A total number of 410 ndividuals agreed to participate setting the response rate at 97%.

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The second group is a group of health professionals who are directly involved in the management and prevention of hypertension in Mbabane Government Hospital. The whole population (72) of health professionals dealing with individuals with hypertension was approached for participation in the study. However, only 59 agreed to participate hence the response rate was 82%. The participants included: doctors (9), physiotherapist (4), occupational therapists (3), dieticians (3) and nurses (40).

## 3.5 METHODS OF DATA COLLECTION

Data for both individuals with hypertension and health professionals was collected quantitatively using interview questionnaires. This section presents the research instruments used in the study.

### 3.5.1 Questionnaire for hypertensive individuals

The questionnaire for hypertensive individuals was an interview administered questionnaire with four sections. Both the English and the SiSwati versions where made available to participants.

**Section A** assessed socio-demographic traits of the participants and it was composed of 9 items. These items include gender, sex, tobacco use, alcohol use, education level and marital status. Physical measurements such as height, weight and blood pressure were also recorded in this section. In addition, BMI was calculated and recorded.

**Section B** assessed hypertensive individual's perceptions with regards to their health status and PA counselling received during their treatment and follow up visits. These components were measured by two items, the first item which read "considering you have hypertension, how would you describe your general health"? To this question, the respondents were asked to rate their health as excellent, very good, good, fair or poor. The second item was "has your health care provider advised you to follow an exercise programme". To this question the respondents were asked to indicate yes or no by ticking in the boxes provided.

**Section C** was the short version of the International Physical Activity Questionnaire (IPAQ) which can be self or interview administered. It was developed by the WHO in 1998 and was used to elicit information from individuals with hypertension regarding their participation in PA. The IPAQ consist of 7 items which request information regarding PA in work, transport, domestic and leisure domains. Question 1 and 2 elicit information regarding vigorous activity, 3 and 4 moderate, 5 and 6 walking and 7 sitting on week days. In order to determine active or sedentary PA levels, the time spent is requested for each domain.

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**Section D** was the Exercise Benefit Barrier Scale (EBBS) and assessed perceptions regarding benefits of and barriers to PA participation among individuals with hypertension. It was designed by Sechrist, Walker and Pender (1985) in response to a need for an instrument to determine perceptions of individuals concerning the benefits of and barriers to participating in exercise. The Benefits sub-scale has 29 items and the Barrier sub-scale has 14 items making a total of 43 items. Both sub-scales are in a 4-point Likert format that ranges from strongly agree (4) to strongly disagree (1), which helps in obtaining an ordinal measure of strength of the agreement with each item. The possible range of scores for the complete scale is 43-172. The Benefits sub-scale score range from 29-116 while the Barriers sub-scale ranges from 14-56, the higher the score the greater the perceived benefit or barrier to PA (Sechrist, et al., 1985). The EBBS was chosen for data collection in this study because it has good properties to be used among adults (Davila, 2010). In addition, the scale measures physical, physiological and social benefits and also measures several types of barriers to performing PA, such as environmental, physical and socio-cultural.

### 3.5.2 Questionnaire for health professionals

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The questionnaire for health professionals was self-administered in the original language of construction which is English and comprised of two sections.

**Section A** assessed socio-demographic information of the participants and contained five items. These items included age, gender, level of education, occupation and number of years of practice.

**Section B** was the Physical Activity Exit Interview questionnaire. It was used to measure the content of PA counselling of health professionals (Sciamanna, Goldstein, Marcus, Lawrence & Pinto, 2004). It consists of 12 yes and no questions covering the main content that health care providers may discuss pertaining PA. The score of the questionnaire range from 0-12 whereby a score of 0-4 reflects a poor quality of PA counselling content while 5-8 is a moderate quality content and 9-12 is a high quality content.

## 3.6 VALIDITY AND RELIABILITY

Validity can be defined as the degree to which a test measures what it is supposed to measure while reliability is defined as the extent to which results are consistent over time (Joppe, 2000). To ensure reliability in this study, measurements of blood pressure, height and weight were taken twice and an average of the two reading was recorded. The validity and reliability of each scale will be outlined below:

- **International Physical Activity Questionnaire:** Validity and reliability of the scale has been tested extensively by WHO across 12 countries around the world following a common protocol. The final results suggest that these measures have acceptable properties for use in many settings and in different languages and have been proven to have acceptable measurements (Craig et al., 2003). In addition, a study done in South Africa among community dwelling individuals found the IPAQ-S English version to be reliable for the Southern African context too. Steyl (2013) reported a Chronbach's alpha of 0.785.
- **Exercise Benefits Barrier Scale Questionnaire:** Validity and reliability of the questionnaire was evaluated by the authors by testing a sample of 650 individuals from a general community (Sechrist et al., 1985). The participant's age ranged between 18-88 years with a mean age of 38.7 years. Internal consistency of the 43 item scale was measured using Cronbach's alpha, and the standardized alpha for the total scale was 0.952. The standardised alpha for the Benefits sub-scale was 0.953 and 0.866 for the Barriers sub-scale. In addition, test-retest reliability over two weeks was 0.889 for the total scale, 0.893 for the Benefits sub-scale and, 0.772 for the Barriers subscale. Benefits Barrier Scale psychometric properties have been widely used and supported by previous research studies and it has demonstrated good reliability and validity in older, middle and young adults (Stutts, 2002).

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- **Physical activity exit interview:** Validity and reliability was tested on a sample of 43 medical doctors in a hospital setting (Sciamanna et al., 2004). The PAEI was found to have been reliable in determining the content of physical activity counselling and scored an alpha coefficient of 0.87 as reported by Sciamanna et al. (2004).

Additional measures to ensure the reliability and validity of the questionnaires were taken. The original questionnaire of the IPAQ and the EBBS were designed in English. Therefore, both questionnaires were translated by an accredited translator into Siswati, the local language spoken by all Swazis. In order to ensure that the translations have the same meaning as the original English questionnaires, an independent accredited translator translated the Siswati versions back to English. After the back translation, the IPAQ was found to have returned the same meaning as the original English version. Therefore, minor grammar and spelling changes were made. However, one item in the EBBS was found not to have returned the same meaning as the original English version. The phrases "Kuyabita" has a double meaning "costly or taxing" and it was changed to "Kudulile" which only means "costly". Finally, spelling and grammar changes were also made to the questionnaire.

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After satisfactorily making changes to the questionnaires, a pilot study was done for both translated versions of the IPAQ and the EBBS questionnaires. The aim of the pilot was to determine test-retest reliability, face validity and time taken to complete the questionnaire. According to Polit, Beck & Hungler (2001), a pilot study can be used as a "small scale version or trial run in preparation for a major study". In addition, Baker (1994) noted that a pilot study is often used to pre-test or try out a research instrument and recommended an enrolment of a sample size of about 10-20% of the sample size for the actual study. However, smaller samples have been used in literature. In this particular study, fifteen (15) hypertensive individuals for each version who met the inclusion criteria were enrolled to participate in the pilot study after consent was obtained.

In total, thirty questionnaires, 15 English and 15 Siswati questionnaires were administered. It was found that the average time taken to complete the questionnaire was 25 minutes. To determine test re-test reliability, the questionnaires (IPAQ AND EBBS) were administered again after a two week period. The Chronbach`s alpha of the translated versions was 0.894 and 0.766 for the IPAQ and EBBS respectively which was deemed acceptable (Nunally, 1994).

The questionnaire for health professionals was piloted in its original language of construction which is English. This was done in order to determine test re-test reliability, face validity and time taken to complete the questionnaire. Ten health professionals who met the inclusion criteria were enrolled in the pilot study. The average time taken for the questionnaire to be completed was 5 minutes. There were no changes made to the questionnaire even though most participants felt that having to indicate "yes" or "no" was limiting and suggested that "sometimes" and "never" be added to the questionnaire. To determine test re-test reliability, the questionnaire was also administered again after a period of two weeks. A Chronbach`s alpha of the translated versions of the PAEI was 0.735 which was deemed acceptable (Nunally, 1994).

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## 3.7 DATA COLLECTION PROCEDURE

Permission and ethical clearance from the Senate Higher Degree and Research Committee of the University of the Western Cape as well as the Scientific Research and Ethics Committee of Swaziland was obtained. Prior to the main study, one physiotherapist and one nurse were trained in a two day workshop in order to assist with data collection. The research assistants were familiarised with the aims, objectives, procedure and tools for data collection by the principal researcher. During the training sessions, research assistants were given detailed instructions on the administration of the study questionnaire. The role of the research assistants and the researcher was to explain the purpose of the study, distribute informed consent forms, information sheets, taking physical measurements such as blood pressure, height, weight as well as administer questionnaires to the willing participants.

The selection criteria for research assistants was based on the fact that these individuals are medically oriented which made it easy for them to understand the concepts of PA and hypertension thereby contributing positively to the validity and reliability of the results.

### 3.7.1 Hypertensive Individuals

Data from hypertensive individuals was collected on the scheduled day of their weekly visit for treatment and follow-up care. The researcher and the assistants explained the aims, objectives, data collection procedure and the human right protection to the individuals in the waiting area. This was followed by assigning of numbers. On average, one hundred and sixty (160) individuals where recorded on each clinic day. To avoid interruption in the running of the clinic, individuals were only approached after consultation with their doctor. Sampling was done using the assigned numbers where every 2nd individual was approached to participate. The individuals, who declined participation, were thanked and allowed to leave as participation was voluntary, only then the next individual was approached. This process was followed until 422 participants were approached. The willing participants were invited into a nearby private room where they were offered a seat and allowed to rest for 5 minutes. Firstly, the participants were asked to sign or thumbprint the consent forms. This was followed by the principal and the assistant researchers taking physical measurements such as blood pressure, weight and height following the same order. Both height and weight was measured without shoes to the nearest 0.5 cm and 0.5 kg respectively. Blood pressure was taken in a sitting position on the right arm of the participant after a minimum of five minutes rest using a standard mercury sphygmomanometer. BMI was also calculated by dividing the mass by the height (kg/m2) and recorded. All measurements were taken twice to ensure reliability and an average of the two readings was recorded. Lastly, the questionnaire was administered and the participants were thanked. The principal researcher and the research assistants remained available throughout the whole processes for any question that might arise. All completed questionnaires were locked in a safe place only accessible to the principal researcher.

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### 3.7.2 Health Professionals

Taking into consideration the busy schedule of the health professionals, they were given invitation letters with information sheets but were seen individually at their own time.

## 3.8 DATA ANALYSIS

Data was analysed using the Statistical Package for Social Sciences (SPSS) version 21. Descriptive statistics was employed to summarise socio-demographic data of the study. This was expressed as frequencies, percentages, means and standard deviations and illustrated by means of tables, graphs and charts. Inferential statistics were used to determine associations between socio-demographic data, levels of PA, benefits of and barriers to PA. Chi-square tests were done to determine associations between PA and selected socio-demographic data for categorical variables. For continuous variables, Student t-test was used to determine significant associations between mean age and PA (sedentary and active). PA levels were dichotomised into active (≤ 599 MET-minutes/week) and sedentary (≥ 600 MET- minutes/weeks). Blood pressure was classified into controlled (≤ 140/≤ 90 mmHg) uncontrolled (≥ 140/≥ 90 mmHg). BMI was classified as underweight (<18.5), normal (18.5-24.9), overweight (25-29.9) and obese (>30). The level of significance was set at 5% level ($P < 0.05$).

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## 3.9 ETHICAL CONSIDERATION

Permission and ethical clearance was obtained from the Senate Higher Degree and Research Committees of the University of the Western Cape, Swaziland Scientific and Research Committee, Swaziland Ministry of Health, Senior Medical officer and the participants. Participation in this study was voluntary, therefore no incentives were offered to potential participants as an inducement to participate in the study. Participants were allowed to withdraw from the study at any time and in case of any complaint, they were assured of being referred appropriately. Participants were assured that if they should withdraw they would not be penalised or lose any benefit to which they otherwise qualify. In the case of refusal to participate in the study, participants were thanked and the next one in the system was approached.

The nature, aims and importance of the study was explained and written informed consent was obtained from all participants. All research assistants were trained on the privacy and protection of human subjects. To ensure confidentiality and anonymity, no participant was known by name but numbers during data collection, analysis and publications. In addition, all participants were treated with dignity and respect throughout the data collection process. The information obtained from participants was kept under lock and key and only accessed by the researcher. The findings of the study were disseminated to all stake holders.

## 3.10 SUMMARY

In this chapter, the methodology employed to conduct this study was presented. The methodology comprised of the setting, study design and its appropriateness for the study. In addition, the population and sampling, data collection instruments, the procedure and ethical issues were outlined. The results of the study will be discussed in the next chapter.

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# CHAPTER FOUR

# RESULTS

## 4.1 INTRODUCTION

This chapter contains the results of the statistical analysis that attempted to answer the objectives of the study. The results are presented in two sections. The first section presents results pertaining to individuals with hypertension while the second section presents the results pertaining to health care professionals.

## SECTION A: INDIVIDUALS WITH HYPERTENSION

## 4.2 DESCRIPTION OF SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE STUDY SAMPLE

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A total number of 422 individuals with hypertension from Mbabane Government Hospital were approached to participate in the study and out of that number, 410 individuals consented to participate achieving a response rate of 97%. The participants` age ranged from 24 to 65 years with a mean age of 54.08 (SD=8.81) and nearly three quarters (72.2%) of the participants were over 50 years. The study sample consisted of females 74.9% (n=307) compared to males 25.1% (n=103). A large proportion of the participants live in the rural area (61.5%) while the minority (38.5%) live in the urban area with most (83.4%) residing in the Hhohho region. Furthermore, approximately two-thirds (67.6%) of the participants were married and 47.3% had attained high school education. More than half of the participants (56.8%) reported unemployment. Smoking was reported by 2.9% and alcohol consumption by 2.2% of the study sample as illustrated in Table 4.1.

**Table 4.1: Distribution of socio-demographic characteristics of respondents (n=410)**

| Variable | Frequency (n) | Percentage % |
|---|---|---|
| **Age (Mean= 54.08; SD = 8.81)** | | |
| **Age group** | | |
| 39 and less | 29 | 7.1 |
| 40-49 | 85 | 20.7 |
| 50-59 | 153 | 37.3 |
| 60 and above | 143 | 34.9 |
| **Gender** | | |
| Male | 103 | 25.1 |
| Female | 307 | 74.9 |
| **Residence** | | |
| Rural | 252 | 61.5 |
| Urban | 158 | 38.5 |
| **Region** | | |
| Hhohho | 342 | 83 |
| Shiselweni | 20 | 4.8 |
| Lubombo | 8 | 2.0 |
| Manzini | 40 | 9.8 |
| **Marital status** | | |
| Single | 133 | 32.4 |
| Married/widowed/divorced | 277 | 67.6 |
| **Level of education** | | |
| None | 39 | 9.5 |
| Primary | 130 | 31.7 |
| High /Secondary school | 194 | 47.3 |
| Tertiary | 47 | 11.5 |
| **Employment status** | | |
| Employed | 177 | 43.2 |
| Unemployed/retired/pensioned | 233 | 56.8 |
| **Smoking** | | |
| Yes | 12 | 2.9 |
| No | 398 | 97.1 |
| **Alcohol** | | |
| Yes | 9.0 | 2.2 |
| No | 401 | 97.8 |

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Physical measurements including blood pressure, weight, height and body mass index (BMI) were also reported. The mean height of the study sample was 1.63 metres (SD = 0.12) while the mean weight was 82.97kg (SD = 17.75). Body mass index was calculated by dividing the mass by the height ($kg/m^2$). Individuals were then categorised into underweight (2.2%), normal weight (12.2%), overweight (32.75%) and obese (52.9%) and the mean BMI was 31.89 (SD= 6.87) as illustrated in Table 4.2. Blood pressure was measured and categorised accordingly. Those with readings of <140mmHg / < 90mmHg) were categorised as controlled hypertension and those with readings of ≥140mmHg / ≥ 90mmHg where categorised as uncontrolled hypertension. The mean systolic blood pressure was 158.74 (SD=26.50) and diastolic blood pressure was 94.65 (SD= 17.19). More than half (57%) of the study sample`s hypertension was not controlled as illustrated in Figure 4.1.

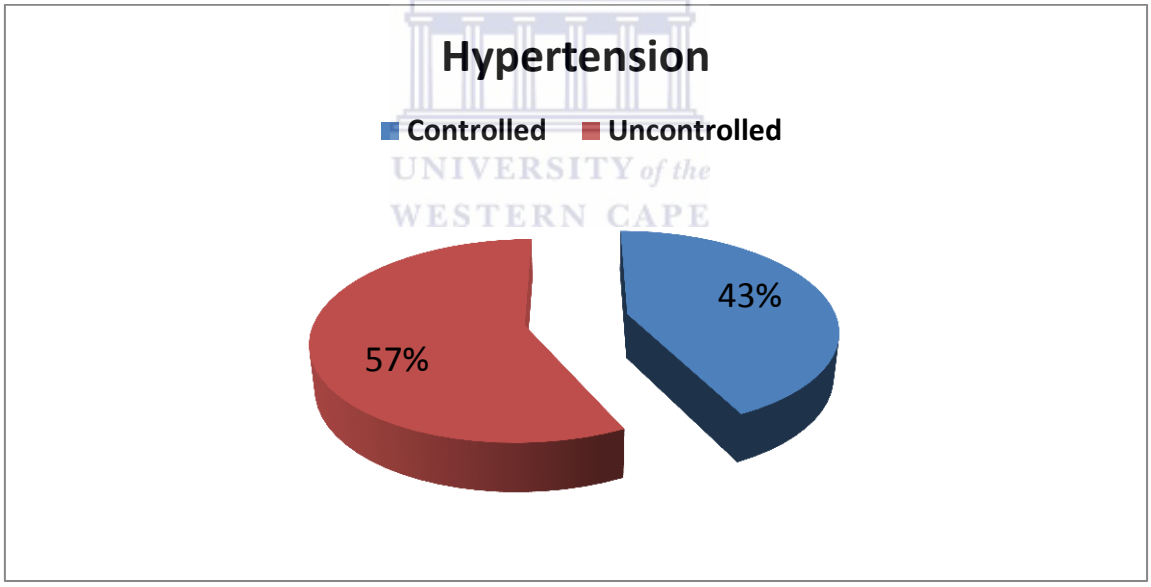

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Figure 4.1: Percent distribution of Hypertension (n=410).

**Table 4.2: Physical measurements of the study sample (n=410)**

| Variable | Mean | Standard deviation |
|---|---|---|
| Weight | 83.61 | 17.412 |
| Height | 1.62 | 0.12 |
| Body Mass Index | 31.89 | 6.87 |
| Systolic blood pressure | 158.74 | 26.5 |
| Diastolic blood pressure | 94.65 | 17.184 |

## 4.3 PERCIEVED GENERAL HEALTH STATUS AND EXERCISE ADVICE

The participants were also asked to report how they perceived their general health and the advice received with regards to exercise. Most participants reported that they perceived their health as poor (65.9%), followed by fair (24.9%), good (5.6%) and very good (3.7%). The number of people who reported excellent health was too small, therefore was removed from the study. In addition, participants were asked if their health care provider had advised them to follow an exercise programme. The majority (64.8%) indicated receiving no advice regarding exercise. These results are summarised in Table 4.3.

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**Table 4.3: Perceived health and exercise advise**

| General health and advice | Frequency | Percentage% | Significance (P-Value) |
|---|---|---|---|
| | | | **11.580 (0.0009)*** |
| **General health status** | | | |
| Very good | 15 | 3.7 | |
| Good | 23 | 5.6 | |
| Fair | 102 | 24.9 | |
| Poor | 270 | 65.9 | |
| **Exercise advise** | | | |
| Yes | 142 | 35.2 | |
| No | 268 | 64.8 | |

*: Significant at 5% level

## 4.4 PHYSICAL ACTIVITY LEVELS AMONG INDIVIDUALS WITH HYPERTENSION

The levels of physical activity (PA) were measured by the short form of the International Physical Activity Questionnaire (IPAQ). The questionnaire consisted of seven items which measure PA in different domains which include vigorous, moderate, walking and sitting. In order to determine levels of PA, participants were requested to report the time they spent doing PA for at least 10 minutes or more during the last 7 days. The level of PA was determined by the sum of all the domains. Participants who accumulated MET-minutes/week of 0-599 were considered sedentary while those who accumulated $\geq$ 600 MET-minutes/weeks were considered to be active. According to these guidelines, 52.9% (n=217) of the study sample was considered sedentary and 47.1% (n=193) was considered active as outlined in Figure 4.2.

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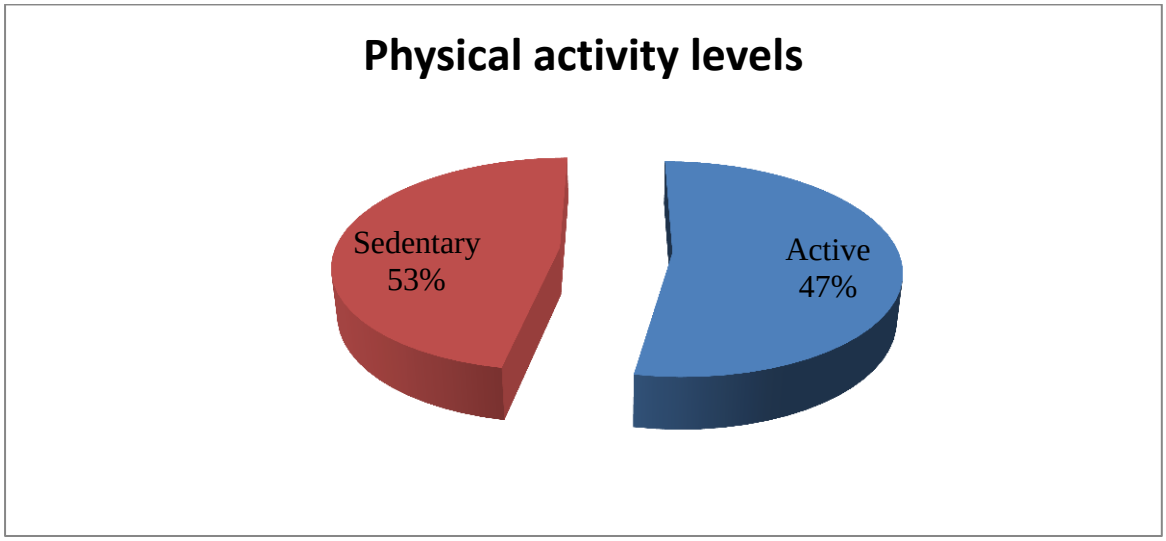


**Figure 4.2:** Percent distribution of physical activity levels of the study sample (n=410)

## 4.5 FACTORS ASSOCIATED WITH PHYSICAL ACTIVITY PARTICIPATION

The association between participants mean age and the level of PA was determined. The results indicated that participants categorised as active had lower mean age score 51.70 (SD=6.92) as compared to those categorised as sedentary 56.19 (SD=6.92) and a Student t-test showed that there was a statistical significance (P=0.000 < 0.05) as summarised in Table 4.4. In addition, other socio-demographic details such as gender, residence, marital status, level of education and employment status were also analysed using Chi-square test. In terms of gender, female participants were found to be more active (57.9%) as compared to their male counterparts (44.7%). A similar pattern was seen between married and single participants. Married participants reported slightly higher levels of PA (53.3%) as compared to single participants (46.6%). The level of education was also analysed, participants who attained primary school education (50%) and those with no form of education (48.7%) recorded the highest PA levels. However sedentary levels across all education categories were more than half. Participants who were employed were less active (40.1%) as compared to the unemployed (52.4%) with sedentary levels of (59.9%). Rural participants were more active (50%) as compared to urban participants (42.4%). Apart from a statistical significance which was found between mean age and levels of PA (P-value = < 0.05), there was no other statistical significance found among the other variable as illustrated in Table 4.4.

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**Table 4.4: Factors associated with physical activity participation**

| Variable | Sedentary (n=217) | | Active (n=193) | | Significance (P -Value) |
|---|---|---|---|---|---|
| **Mean age** | 56.19 (SD=6.921) | | 51.70 (10.032) | | 0.000* |
| | **Frequency** | **Percentage %** | **Frequency** | **Percentage %** | |
| **Gender** | | | | | 0.321(0.648) |
| Male | 57 | 55.3 | 46 | 44.7 | |
| Female | 160 | 42.1 | 147 | 57.9 | |
| **Residence** | | | | | 2.248(0.155) |
| Rural | 126 | 50 | 126 | 50 | |
| Urban | 91 | 57.6 | 67 | 42.4 | |
| **Marital status** | | | | | 0.160(0.916) |
| Single | 71 | 53.4 | 62 | 46.6 | |
| Married | 146 | 46.7 | 131 | 53.3 | |
| **Level of education** | | | | | 0.877(0.831) |
| None | 20 | 51.3 | 19 | 48.7 | |
| Primary | 65 | 50 | 65 | 50 | |
| High school | 107 | 53.2 | 87 | 46.8 | |
| Tertiary | 25 | 55.2 | 22 | 44.8 | |
| **Employment status** | | | | | 6.056(0.169) |
| Employed | 106 | 59.9 | 71 | 40.1 | |
| Unemployed | 111 | 47.6 | 122 | 52.4 | |

*: Significant at 5% level

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An independent Student t-test was also used to compare mean scores of hypertension (Systolic and Diastolic blood pressure) across PA levels (sedentary and active). The mean score for systolic blood pressure in the sedentary category was much higher (165 .11 (SD=24.959) than the ones seen in the active category (151.59 (SD=26.448) as summarised in Table 4.5. A similar pattern was seen between mean scores of diastolic blood pressure and PA levels (sedentary and active). Furthermore, the Student t-test revealed a statistical significance in the mean scores for both systolic (Mean = 165 .11, SD= 24.959; p=0.000) and diastolic (Mean = 97.53, SD= 18.119; p=0.000) when compared with PA levels as illustrated in Table 4.5.

**4.5: Descriptive data for the mean scores of hypertension by physical activity using t-test.**

| Variable | Sedentary Mean (SD) | Active Mean (SD) | P-value |
|---|---|---|---|
| Systolic blood pressure | 165 .11 (24.959) | 151.59(26.448) | 0.000* |
| Diastolic blood pressure | 97.53 (18.119) | 91.42 (15.489) | 0.000* |

*: Significant at 5% level

## 4.6 ASSOCIATIONS BETWEEN HEALTH-RELATED FACTORS AND PHYSICAL ACTIVITY

Relationships between PA and health-related variables were also determined. With regard to smoking, participants who smoke reported the highest percentage (50.0%) of PA while the participants who did not smoke (47.0%) were less active. A different pattern of PA was observed between participants who did not consume alcohol and those who consumed alcohol. The participants who did not consume alcohol (47.1%) were more active than the participants who consumed alcohol (44.4%). For the body mass index category, the results for underweight were too small (0.2%), therefore were removed from the study. The highest sedentary levels were seen in participants who are obese (55.1%), whereas the participants who were normal weight and overweight reported the highest PA (48.0%) and (50.0%) respectively. Participants with very good health reported the highest PA levels (66.7%) as compared to poor health (46.7%). Even though there was no significant difference between participants who received exercise advice (47.5%) and those who did not (45.8%), participants who received advice had slightly higher PA levels. However, the results indicated that there was no statistical significance at 5% level for all the variables as outlined in Table 4.6.

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**Table 4.6: Associations between health - related factors and physical activity levels (n=410)**

| Variable | Sedentary (n=217) | Active (n=193) | Significance (p-value) |
|---|---|---|---|
| | n (%) | n (%) | |
| **Smoking** | | | 0.043 (1.000) |
| Yes | 6 (50.0) | 6 (50.0) | |
| No | 211 (53.0) | 187 (47.0) | |
| **Alcohol** | | | 0.026 (1.000) |
| Yes | 5 (55.6) | 4 (44.4) | |
| No | 212 (52.9) | 189 (47.1) | |
| **Body mass index** | | | 2.033 (0.566) |
| Normal weight | 27 (52.5) | 24 (48.0) | |
| Over weight | 67 (50.0) | 67 (50.0) | |
| Obese | 124 (55.1) | 101 (44.9) | |
| **Health status** | | | 2.489 (0.477) |
| Very good | 5 (33.3) | 10 (66.7) | |
| Good | 13 (56.5) | 10 (43.5) | |
| Fair | 55 (53.9) | 47(46.1) | |
| Poor | 144 (53.3) | 47 (46.7) | |
| **Exercise advice** | | | 0.110 (0.757) |
| Yes | 78 (54.2) | 66 (45.8) | |
| No | 139 (52.5) | 126 (47.5) | |

Not significant at 5% level

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## 4.7 BENEFITS OF, AND BARRIERS TO, PHYSICAL ACTIVITY PARTICIPATION

The study also analysed the barriers that could have been hindering participants from, and the benefits that could have been motivating the participants to, participating in PA. The 43 items making up the Exercise Benefits Barrier Scale were split into barriers (14 items) and benefits (29 items). Table 4.9 and Table 4.10 summarises the perceived barriers of and benefits to PA participation of the study sample. With regard to the barriers, participants were requested to indicate the degree to which they perceived each of the 14 ideas related to exercise as being a barrier.

A number of ideas were perceived as actual barriers e.g. "*I am fatigued by exercise (72%), exercising takes too much of my time (66.3%), exercise takes too much time from my family responsibilities (61.7%) as well as the idea that exercise takes too much time from family relationships (60%)".* In addition barriers such as *"my family members do not encourage me to exercise (57.8%), there are too few places for me to exercise (57.1%), places for me to exercise are too far (53.9%), Exercise facilities do not have convenient schedules for me (53.2%) and I think people in exercise clothes look funny"* were considered to be substantial barriers to physical activity participation as summarised in Table 4.7.

**Table 4.7: Barriers to physical activity as perceived by hypertensive individuals**

| | **Percentages %** | |
|---|---|---|
| **List of ideas** | **Agree** | **Disagree** |
| I am fatigued by exercise | 72.2 | 27.8 |
| Exercising takes too much of my time | 66.3 | 33.7 |
| Exercise takes too much time from my family responsibilities | 61.7 | 38.3 |
| Exercise takes too much time from family relationships | 60 | 40 |
| My family members do not encourage me to exercise | 57.8 | 42.2 |
| There are too few places for me to exercise | 57.1 | 42.9 |
| Places for me to exercise are too far | 53.9 | 46.1 |
| Exercise facilities do not have convenient schedules for me | 53.2 | 46.8 |
| I think people in exercise clothes look funny | 51 | 49 |
| Exercise tires me | 48.3 | 51.3 |
| My spouse (or significant other) does not encourage exercise. | 47.1 | 52.9 |
| It costs too much to exercise | 43.7 | 56.3 |
| Exercise is hard work | 39.5 | 60.5 |
| I am too embarrassed to exercise | 27.6 | 72.4 |

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A similar analysis was also done for the benefits scale and most of the ideas were perceived as strong benefits of participation in PA. The scores for some of the ideas considered actual benefits include; "*Exercise improves function of my cardio-vascular system (100%), exercise improves overall body functioning for me/ exercise increases my mental alertness (95.5%), exercise improves the way my body looks (95.4%) and I enjoy exercise (92%)* as illustrated in Table 4.8.

**Table 4.8: Benefits to physical activity as perceived by hypertensive individuals (n=410)**

| List of ideas | Agree % | Disagree % |
|---|---|---|
| Exercise improves function of my cardio-vascular system | 100 | 0 |
| Exercise improves the way my body looks | 95.4 | 4.6 |
| Exercise allows me to carry out normal activities without becoming tired | 92 | 8 |
| I enjoy exercise | 92 | 8 |
| Exercise increases my mental alertness | 90.5 | 9.5 |
| Exercise improves overall body functioning for me | 90.5 | 9.5 |
| Exercise helps me sleep better at night | 89.3 | 10.7 |
| Exercise gives me a sense of personal accomplishment | 88.8 | 11.2 |
| Exercise improves the quality of my work | 88.5 | 11.5 |
| Exercise increases my muscle strength | 88.3 | 11.7 |
| Exercise decreases feeling of stress and tension for me | 87.8 | 12 |
| Exercise improves my flexibility | 87.8 | 12.2 |
| Exercise increases my stamina | 86.6 | 13.4 |
| I will live longer if I exercise | 85.6 | 14.4 |
| My muscle tone is improved by exercise | 84.6 | 15.4 |
| My disposition improves with exercise | 84.4 | 15.6 |
| Exercise is good entertainment for me | 83.9 | 16.1 |
| Exercise increases my acceptance by others | 83.9 | 16.1 |
| Exercise increases my level of physical fitness | 83.2 | 16.8 |
| I will prevent heart attacks by exercise | 82.9 | 17.1 |
| Exercise makes me feel relaxed | 81.5 | 18.5 |
| Exercise improves my self-concept | 81.2 | 18.8 |
| Exercise is a good way for me to meet new people | 79 | 21 |
| My physical endurance is improved by exercise | 78.3 | 21.7 |
| Exercise will keep me from having high blood pressure | 78 | 22 |
| I have improved feeling of well-being from exercise | 73.4 | 26.6 |
| Exercise improves my mental health | 66.3 | 33.7 |
| Exercise lets me have contact with friends and persons I enjoy | 61.5 | 38.5 |
| Exercise helps me decrease fatigue | 57 | 43 |

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## SECTION B: HEALTH PROFESSIONALS

### 4.8 DESCRIPTION OF SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE STUDY SAMPLE

A total number of 72 health professionals involved in the management of hypertension in Mbabane Government Hospital were approached to participate in the study and only 59 consented to participate. The response rate was thus 82% and the majority of participants were females (71.2%). The age of the respondents ranged from 24 to 62 years, with a mean age of 38.2 (SD= 9.76). The majority of participants were nurses (67.8%) and 59.3% of the study sample had obtained a degree. The mean years of experience was 12.8 (SD=9.336). The results are summarised in Table 4.9.

**Table 4.9: Distribution of socio-demographic characteristics of participants (n=59)**

| Variable | Frequency | Percentage (%) |
|---|---|---|
| **Age group** | | |
| 29 and less | 12 | 20.3 |
| 30-39 | 22 | 37.3 |
| 40-49 | 16 | 27.1 |
| 50 and above | 9 | 15.3 |
| **Gender** | | |
| Male | 17 | 28.8 |
| Female | 42 | 71.2 |
| **Level of education** | | |
| Diploma | 24 | 40.7 |
| Degree | 35 | 59.3 |
| **Occupation** | | |
| Doctor | 9 | 15.3 |
| Nurse | 40 | 67.8 |
| Therapist | 10 | 16.9 |
| **Years of experience** | | |
| 4 and less | 12 | 20.3 |
| 5-10 years | 19 | 32.2 |
| 11-16 years | 8 | 13.6 |
| 17-22 years | 9 | 15.3 |
| 23 and above | 11 | 18.6 |

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## 4.9 PHYSICAL ACTIVITY COUNSELLING PRACTICES

The Physical Activity Exit Interview questionnaire was used to measure PA counselling content of health professionals. Following the guidelines of this questionnaire, PA counselling content was categorised into three levels whereby a score of 0-4 indicated poor quality, 5-8 moderate and 9-12 high quality physical activity counselling. Due to a very small percentage of high quality PA counselling content (3%), the categories were reduced to poor and moderate quality. Therefore, 58% of health professionals were considered to be poor counsellors of PA while 42% were considered to be moderate counsellors as illustrated in Figure 4.3.

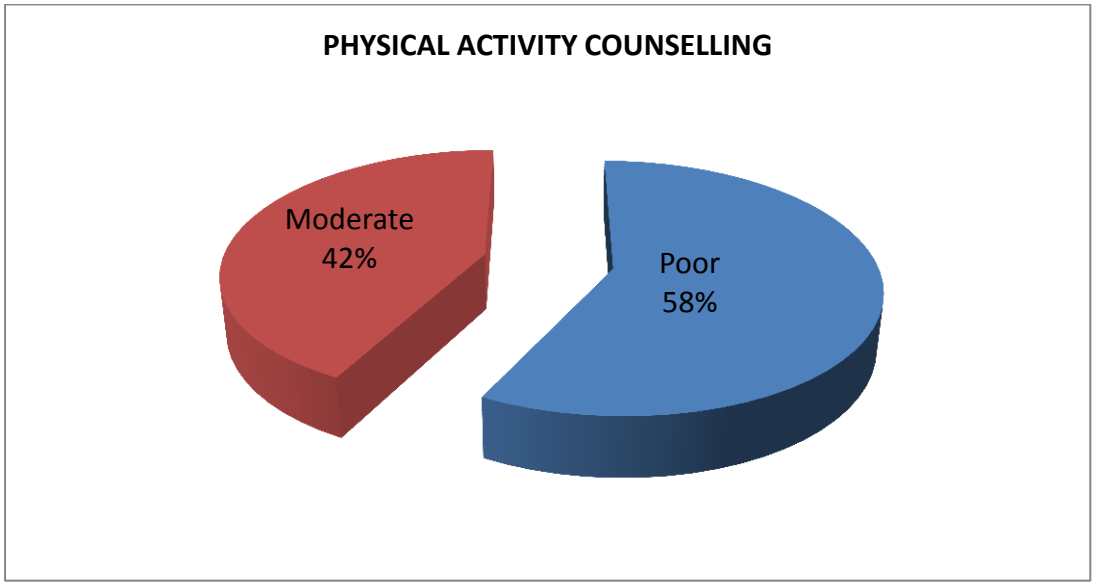

Figure 4.3: Percent distribution of physical activity counselling content

## 4.10 RELATIONSHIPS BETWEEN PHYSICAL ACTIVITY COUNSELLING AND SOCIO-DEMOGRAPHIC INFORMATION

The association between participants mean age and the quality of PA counselling was analysed by using an independent Student t-test. However, the results showed that there was no significant difference between mean age and quality of PA counselling practices between the groups [Active=37.91 (SD = 9.057), Sedentary= 38.16 (SD =10.827)] and no relationship existed. In terms of gender, male participants recorded the highest in moderate quality PA counselling content (58.8%) as compared to female participants (35.7%). Health professionals with a degree recorded the highest moderate quality PA counselling content (45%) as compared to those who obtained a diploma (37.5%). The doctors and therapists had the highest moderate quality PA counselling content (66.7%) and (50.0%) and health professionals with years of experience less than 4 years (58.3%) and 5-10 years (62.5%) recorded the highest in moderate quality PA counselling content. However, no significant relationships were found between PA counselling content and the other socio-demographic variables (p-value < 0.05) as outlined in Table 4.10.

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**Table 4.10: Relationships between physical activity counselling practices and socio-demographic characteristics**

| Variable | Physical activity counselling | | | | Significance (P -Value) |
|---|---|---|---|---|---|
| | Poor | | Moderate | | |
| **Mean age** | 37.91 (SD= 9.057) | | 38.16 (SD=10.827) | | 0.924 |
| | **Frequency** | **Percentage %** | **Frequency** | **Percentage %** | |
| **Gender** | | | | | 2.647 (0.104) |
| Male | 7 | 41.2 | 10 | 58.8 | |
| Female | 27 | 64.3 | 15 | 35.7 | |
| **Level of education** | | | | | 0.393 (0.531) |
| Diploma | 15 | 62.5 | 9 | 37.5 | |
| Degree | 19 | 57.6 | 25 | 42.4 | |
| **Occupation** | | | | | 3.304 (0.192) |
| Doctor | 3 | 33.3 | 6 | 66.7 | |
| Nurse | 26 | 65 | 14 | 35 | |
| Therapist | 5 | 50 | 5 | 50 | |
| **Years of experience** | | | | | 4.476 (0.345) |
| 4 and less | 5 | 41.7 | 7 | 58.3 | |
| 5-10 years | 12 | 37.5 | 7 | 62.5 | |
| 11-16 years | 3 | 63.2 | 5 | 36.8 | |
| 17-22 years | 7 | 77.8 | 2 | 22.2 | |
| 23 and above | 7 | 63.6 | 4 | 36.4 | |

Not significant at 5% level

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PA counselling ideas where further analysed by the most included and the least included ideas. The most included PA idea by health professionals was the idea of *discussing benefits of PA with patients (88.1%),* followed by the idea of "*advising patients to become more physically active (76.3%)".* The ideas which were least included were idea of "*putting a written plan" and "giving out written material on each clinic visit" (6.8%) and (10.2%)* respectively, as illustrated in Table 4.11.

**Table 4.11: Physical Activity Counselling ideas as included in counselling by health professional (n=56)**

| Physical activity counselling ideas | Frequencies | Percentages % |
|---|---|---|
| Do you discuss the benefits of physical activity with your patients? | 52 | 88.1 |
| Do you advise your patients to become more physically active? | 45 | 76.3 |
| Do you inform your patients how frequently they should exercise? | 44 | 73.6 |
| Do you inform your patient the type of exercise they should do? | 29 | 48.2 |
| Do you discuss the topic of physical activity with your patient? | 28 | 47.5 |
| Do you inform your patient on how long they should exercise? | 26 | 44.4 |
| Do you discuss difficult situations patients may encounter or problems that they might have in trying to become more physically active? | 24 | 40.7 |
| Do you discuss with your patients their past experiences in physical activity? | 16 | 27.1 |
| Do inform your patients on how hard they should exercise? | 15 | 25.4 |
| Do you state to the patients that you are planning to discuss physical activity or exercise during each day`s clinic visit? | 12 | 20.3 |
| Do you and your patients put the plan to become more physically active in writing? | 6 | 10.2 |
| Do you give any written material about physical activity or exercise during each day`s clinic visit? | 4 | 6.8 |

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## 4.11 REASONS FOR NOT DISCUSSING PHYSICAL ACTIVITY WITH PATIENTS

The health professionals who indicated that they did not discuss PA with their patients were asked to give reasons. A total of 52.5% (n=31) indicated that they did not discuss PA with their patients and the reasons provided include: *Not my area of expertise (54.8%), Lack of time, (35.5%), lack of knowledge (6.5%) and do not believe it has benefits (3.25%)* as outlined in Table 4.12.

**Table 4.12: Reasons for not discussing physical activity (n=31)**

| Reasons | Frequencies | Percentages % |
|---|---|---|
| Not my area of specialty | 17 | 54.8 |
| Lack of time | 11 | 35.5 |
| Lack of knowledge | 2 | 6.6 |
| It does not have health benefits | 1 | 3.2 |

The most common reason for not discussing PA with patients among health professionals was further assessed according to the occupation. Doctors and therapists indicated lack of time (80%) and (60%) respectively as the main reason for not discussing PA with their patients. While nurses indicated that lack of specialty (67%) was the main reason for not discussion PA with their patients as illustrated in Figure 4.4.

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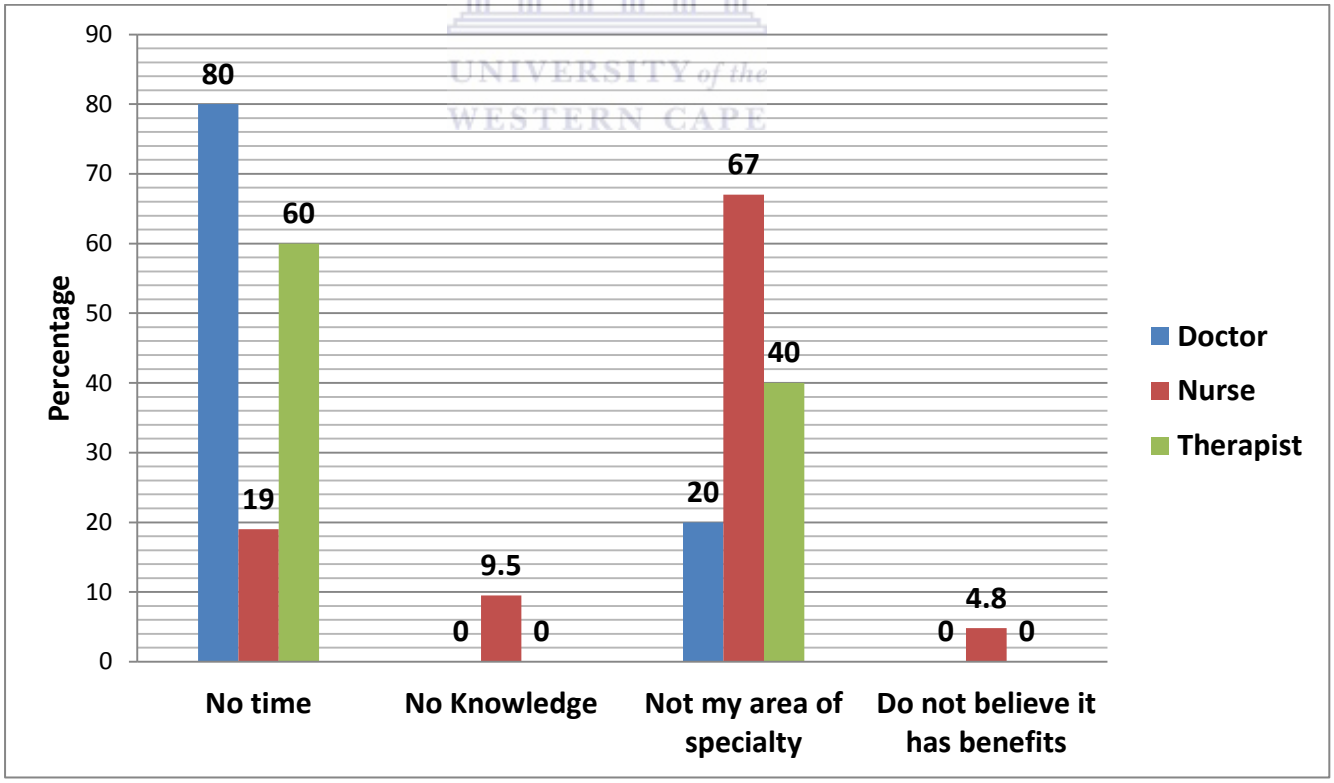


**Figure 4.4: Percent distribution of reasons by occupation (n=31)**

## 4.12 SUMMARY

Chapter four outlined the findings of the study. The aim of this study was to determine the PA participation among adults with hypertension and the extent to which they are encouraged to be physically active by their health professionals. More than half of the hypertensive individuals were categorised as sedentary with very low hypertension control. Despite a significant number of participants having knowledge about benefits of PA, they reported a number of significant barriers to PA participation. The major factor which contributed to physical inactivity was the "feeling of fatigue, time factor, poor health and lack of advice with regards to exercise which was reported by a majority of the participants. In addition, a significant number of health professionals, more than half were categorised as poor counsellors of PA. One significant finding of the study is that despite health professionals discussing the benefits of PA and advice patients to become more physically active, most health professionals do not cover areas such as types of PA, intensity and duration which are the main components of PA counselling. Most health professionals qualify this with lack of time, not area of specialty and lack of knowledge. The impact of these findings is discussed in the next chapter.

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# CHAPTER FIVE

# DISCUSSION

## 5.1 INTRODUCTION

The aim of the study was to determine the physical activity (PA) participation among adults with hypertension in Mbabane, Swaziland and the extent to which they are encouraged to be physically active. This chapter will discuss the results and compare with the salient studies based on literature. The chapter is divided into two sections: the first section will discuss PA participation among individuals with hypertension while the second section will discuss results with regards to health professional`s PA counselling practices in the management and prevention of hypertension.

## SECTION A: INDIVIDUALS WITH HYPERTENSION

## 5.2 SELECTED SOCIO-DEMOGRAPHIC INFORMATION

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In the current study a response rate of 97% was achieved which suggests eagerness of participants to collaborate with health professionals in an effort to find a solution to the burden of hypertension. This kind of participation creates a firm foundation for successful future strategies aimed at promoting and creating awareness with regards to PA and hypertension in Mbabane, Swaziland. The study sample age ranged from 24-65 years with a mean age of 54.08 (SD=8.81). However, the study participants were mainly individuals above the age of 50 years (72.2%) of which the majority were females (74.9%). This shows an over-representation in terms of age and gender, comparable with several studies conducted in other countries which have emphasised the increased general tendency of females to develop chronic diseases of lifestyle (CDL), in particular hypertension, especially with advancement in age. Therefore, women and the elderly should be a public health priority with regard to hypertension and PA.

## 5.3 CONTROL OF HYPERTENSION

Hypertension is a major public health problem of worldwide distribution and is the most common cardio-vascular disease risk factor (Damasceno et al., 2009). Information with regard to the awareness, treatment and control of hypertension has been documented by a number of researchers from different countries (Hajjar & Kotchen, 2003; Hyman & Pavlik 2001). The findings of these studies have associated hypertension with some socio-demographic and geographic factors. Economic factors have also been implicated. Treatment, awareness and control of hypertension are beyond the scope of this study, however the control of hypertension will be briefly discussed to give a brief picture of hypertension control among the population under study.

Lowering systolic and diastolic blood pressure to targets that are <140/90 mm Hg is associated with a decrease in cardio-vascular complications (Chobanian et al., 2003). According to Kearney et al., (2004), it is of concern that despite the efforts being put into the promotion of hypertension control, the rates are reported to be as low as 20% - 30% in the general population. Prevention of hypertension is possible, and early detection and treatment can reduce the incidence of complications and yet the level of control of hypertension is low globally (Israili, Hern´andez-Hern´andez & Valasco, 2007). In a study conducted in Swaziland by STEPS (2007), the results revealed that more than half (53%) of the participants who are already on anti-hypertensive medication had uncontrolled hypertension with a mean systolic blood pressure of 125.20 mm Hg and diastolic blood pressure of 80.50 mm Hg (STEPS, 2007). These findings are comparable to the results of the current study as uncontrolled hypertension was reported to be 57%. However, the mean systolic 158.74mm Hg (SD=26.50) and diastolic 94.65 mm Hg (SD=17.19) blood pressure levels where significantly higher than the ones reported in 2007 by STEPS. Poor compliance to medication and lifestyle modification are the most important causes of uncontrolled blood pressure (Tee et al., 2010).

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The factors which have been found to have a significant effect on compliance are factors such as poor socio-economic status, low level of education, unemployment, lack of effective social support networks, unstable living conditions, long distance from treatment centres, high cost of transport, cultural beliefs about the illness and forgetfulness (Akpa, Agomuoh & Odia, 2005). The individuals with hypertension receiving treatment at Mbabane Government Hospital could probably strongly relate with most of these factors mentioned above. In the current study, low levels of education, long distance from treatment centres which could lead to high transport costs and unemployment were reported by the majority of the participants. In Swaziland, most hypertensive patients are treated at primary and tertiary levels of health care. However, it is known for some reason or the other that patients prefer receiving treatment at tertiary level.

In order to overcome the factors that are likely to lead to non-compliance to both anti-hypertensive and lifestyle modification therapy such as PA, firstly, the Ministry of Health together with all the significant role players should consider standardising hypertension treatment in the country by formulating uniform protocols to avoid differences in the treatment approaches. Secondly, patient referral system between health facilities should be strengthened. Thirdly, education on the importance of compliance to prescribed interventions should be provided and finally, individuals with hypertension should be encouraged to utilise the services that are offered at their nearest facility as most health care facilities are within an 8 km radius (Swaziland National Health Policy, 2007).

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## 5.4 PHYSICAL ACTIVITY PARTICIPATION

Undisputable results of several studies have emphasised the use of regular PA in managing and preventing the occurrence of CDL such as hypertension (Gupta & Guptha, 2010). This concept has been re-enforced by global results from a number of studies at the dawn of the 20th century (Lebrun et al., 2006; CDC, 2003; WHO, 2002; Hagberg et al., 2000).

However, the levels of PA seem to continue to decline due to innovations and other societal changes, both at home and work places which have led to a more sedentary lifestyle in individuals (Sparling et al., 2000). This continuing pattern of inactivity has also been reported in Swaziland`s general population where almost a third (33.1%) of individuals with CDL are sedentary (STEPS, 2007). These sedentary levels seem to be even higher in the current study as more than half (53%) of the study sample was categorised as sedentary. The findings are similar to the findings of Idowu, Adeniyi, Atijosan and Ogwumike (2013) and Ahmed (2009) who in their studies reported low PA levels in more than half of the study sample. In another similar cross-sectional study conducted in Brazil, it was found that 80% of individuals with hypertension were categorised as either low or moderately active (Martins, Guedes, Teixeira, de Oliveira & de Araujo, 2009). The above trends could be explained by the fact that individuals with chronic diseases such as hypertension often avoid PA for the fear of making their condition worse or over-exerting themselves (Kolt & Snyder-Mackler, 2003). Lorig (2003) has also established that individuals with hypertension are frequently faced with other challenges which include among others: difficulty in maintaining life obligations and managing negative emotions such as fear and depression. These factors might affect the patient's self-image and their ability to adopt or maintain the recommended levels of PA (Carter-Edwards, 2004). Therefore, there is a great need for education on levels of PA that are sufficient for health benefits in individuals with hypertension. The education offered should also cover PA related warning signs to ensure the hypertensive individual`s safety. These signs include symptoms such as chest pain or discomfort, dyspnoea, dizziness or malaise, which would necessitate medical supervision or evaluation (Fagard & Cornelissen, 2007). If information with regard to safety is communicated by health professionals, who are already considered as valuable sources of health information by patients, individuals with hypertension could be reassured regarding their safety and the possibility of these individuals to adhere to the prescribed PA could became a reality.

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It is therefore vested upon health professionals to promote and create awareness about lifestyle modification strategies, such as PA because if prescribed correctly, PA is safe for most, if not all individuals with hypertension. PA should be prescribed with the same consideration as prescribing any other effective treatment, which means that adjustments to the progressive goals for PA intensity, duration, frequency, and mode of training should be based on the medical conditions of the clients (Frost & Topp, 2006; Baster & Baster-Brooks, 2005). Finally, with the education and support from health care professionals, hypertensive individuals should adhere to their prescription and learn to integrate PA in their daily routine in order to achieve the desired PA outcomes.

## 5.5 FACTORS ASSOCIATED WITH PHYSICAL ACTIVITY

Several factors have been found to be associated with PA. These include both sociodemographic and health-related factors.

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### 5.5.1 SOCIO-DEMOGRAPHIC FACTORS

Age has been found to be an important determinant of PA by a number of studies (Kabanda & Phillips, 2011; Kagwiza et al., 2005; Owen, Spathonis & Leslie, 2005). The decline in PA with age may be the most consistent finding in PA studies. Chobanian et al. (2003) and Nelson et al. (2010) reported that inactivity is most commonly seen in older patients with hypertension and is often associated with poor health status. The mean age for individuals who are active in the current study is 51.70 (SD=6.921) while the mean age for the sedentary group is 56.19(SD=6.921). This shows that PA levels are higher in the younger age groups as compared the older age groups and a statistical association between mean age and PA was found ($\chi^2_{(3)}$ = 39.28, p- value = 0.000 < 0.05). The findings of the current study differ with the findings of STEPS (2007) who reported that sedentary behaviour in Swaziland is higher among younger age groups as compared to older age groups.

The difference in the findings could be due to the differences in the study samples. In this context, healthcare programmes in line with PA in Mbabane Government Hospital should focus on the elderly who have a higher prevalence of hypertension with higher levels of sedentary behaviour as established in the current study. Moreover, the elderly are also known to be a high risk group for inactivity because they are naturally subjected to a reduction in musculoskeletal frame which is largely due to physical inactivity, as most elderly individuals are commonly unemployed or retired and generally pay less attention to their physical health (Gandasentana & Kusumaratna, 2011). This inactivity due to unemployment or even retirement could be true in the current study as most of the participants are over 50 years. The emphasis on the elderly does not imply that attention should not be given to the younger age groups. PA programmes that cut across all ages should be tailored to encourage the already active groups as well as motivate the age groups with low PA to attain sufficient levels for the management of hypertension.

Gender differences with regard to PA have also been reported in literature. It is believed that males are more physically active than females (Willey, Paik, Sacco, Elkind & Boden-Albala, 2010; Williams, 2008; Azevedo et al., 2007). This is attributed to societal norms and the difference in the nature of employment between the two genders (Willey et al., 2010). In a cross-sectional study done among individuals with hypertension in Rwanda, the study yielded different results as women were found to be more active than their male counterparts (Umuvandimwa, 2011). Similarly, the current study has also established that women (57.9%) were more active than men although no statistical significance was found ($\chi^2_{(1)} = 0.321$, p- value = 0.648 < 0.05). Higher levels of PA among women could be explained by the increase in the demand on PA in women in current times as compared to the olden days. Women in Swaziland are coming from a time when they were considered as minors and were only responsible for all household duties and caregiving activities. With the birth of the new Constitution in 2006, Swazi women are now allowed to assume more demanding positions either in full-time or part-time employment in urban areas.

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On the other hand, rural women are faced with responsibilities demanding PA as they are considered to be the force behind rural agriculture (Lindsey, 2005). Women who are employed even face a double workload as a result of responsibilities of employment in the workplace and household duties. All these demands give women an advantageous position with regard to PA participation. The other factor that has been found to influence women's PA participation positively is the belief that women seem to be more caring and nurturing with higher risk awareness than men who are more ego-oriented and willing to take up risks (Koch, Kralik & Taylor, 2000). This has been affirmed by Mufunda, Albi and Hjelm (2012) and Hjelm and Nambozi (2008), who also reported that, women seem to have better health seeking behaviour for chronic diseases than men. Therefore, the higher levels of PA seen among hypertensive women might be attributed to the knowledge of the health benefits of PA. In some African societies, men tend to leave their wives for healthier women once they get sick (Njoronge & Wanjiru, 2010). This could be particularly true for Swazi women where polygamous marriages are common, therefore women always work towards good health to safeguard their marriages. Comparing the results of the current study with similar studies highlighted above should be done with caution as the difference in the levels of PA observed between the present study and other studies might also be influenced by the difference in the setting, methodology and most importantly the characteristics of the participants. Despite the existing differences, the participation of women in PA should be enhanced and men should be educated and encouraged to participate in PA. The results of the current study highlight the urgent need for developing PA programmes that make men a public health priority in Mbabane Government Hospital.

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The Commission on the Social Determinants of Health (CSDH, 2008) commissioned by the World Health Organisation has highlighted that a place of residence is an important determinant of health. Many scientific studies have reported that rural dwellers are more physically active than urban dwellers (Assah, Ekelund, Brage, Mbanya & Wareham, 2011; Mbanya, Motala, Sobngwi, Assah & Enoru, 2010).

The current study concurs with these findings as rural participants were found to be more active than urban participants, even though no statistical significance was found ($\chi^2_{(1)} = 2.248$, p- value = 0.155 < 0.05). This could be explained by the fact that, unlike people in the urban areas, most people in rural areas of Swaziland are subjected to a lot of PA through long-distance walking as the main means of transportation. In addition, rural dwellers are also subjected to PA demands of food production in agricultural activities. On the other hand, Torun et al. (2002) has reported that the urban environment is known to be associated with increased opportunities for sedentary employment. In this regard, Kagwiza, Phillips and Struthers (2005) have reported that a majority of women who are employed in urban areas in Rwanda are sedentary, thus increasing their risk of developing hypertension. Sobngwi et al. (2002) conducted a study earlier to evaluate and compare PA and its relationship with obesity, hypertension and diabetes in urban and rural areas of Cameroon. The researcher highlighted that urban residents had multiple occupations, reduced walking and cycling times when compared with their rural counterparts. These findings would help conclude that indeed rural dwellers are more physically active than urban dwellers. For this reason, more attention should be paid to educating and encouraging urban dwellers to increase their PA levels. For example, urban dwellers could be encouraged to do PA such as walking, cycling, swimming, gardening or playing with children. In addition, PA could also be incorporated in their day to day routine such as the use of stairs instead of lifts, parking the car a few metres from shopping malls in oreder to create an opportunity to walk.

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Marital status is an important determinant for PA participation (Sobal & Hanson, 2010; Pettee et al., 2006). In addition, married men and women are reported to have higher PA levels as compared to their unmarried counterparts. Even though there was no statistical significance ($\chi^2_{(1)} = 0.016$, p- value = 0.916 < 0.05), the results of the current study have also revealed that a bigger proportion of the married participants are more active (53.3%) than their single counterparts. This could be explained by the findings of Trivedi, Ayotte, Edelman and Bosworth (2008) who reported an association between adherence to medical recommendations and marital status.

The emotional support from a spouse creates a sense of well-being which has been found to be an important component in maintaining important lifestyle changes such as PA. In addition, marriage is an obligation that compels individuals to be involved in PA as they have to run a house and fulfil their household responsibilities. This has been confirmed by Chad et al. (2005) who found that higher levels of PA was noted in individuals living in a household with a spouse, compared to individuals who live alone. From these findings, one can therefore conclude that support from a spouse is a positive factor in PA participation. Furthermore, the commitment to marriage also encourages individuals to stay healthy and hence, these individuals may feel inclined to engage in more positive health-related activities (Wang, 2005). Health professionals should therefore support the single individuals so that they can also be motivated to engage in PA. This can be done at both community and hospital level. In this regard, policy makers together with health professionals should offer support to the single individuals in order for them to become physically active. This can be achieved by setting aside some space in Mbabane Government Hospital for group PA so that these individual could motivate each other.

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Low levels of education have been linked to low levels of PA. In a recent study, educational attainment has been considered to be a strong socio-economic factor that influences PA either through improved economic resources or knowledge of the benefits of PA (Cassetta, Boden-Albala, Sciacca & Giardina, 2007). On the contrary, Duncan, Hannah, Badland and Mummery (2010) and Savio, Da Costa, Schmitz and Da Silva (2008) have reported that higher levels of education and income are related to lower levels of PA. The findings of the current study are in agreement with these findings as more than half (55.2%) of the individuals with tertiary education are categorised as sedentary and reported the lowest PA across all the groups. The explanation for this could be that individuals with low education are exposed to jobs that demand more PA as compared to those with high education. Individuals with low levels of education and those with no form of education have a bigger chance of getting into jobs which demand PA.

Highly educated individuals tend to have lighter or more sedentary jobs and less time for household activities (Miller & Brown, 2004). For this reason people with high education should be targeted with tailored PA programmes at work, home and leisure time. This could be achieved by directing attention to hypertensive individuals with sedentary occupations, particularly individuals with tertiary education.

Studies have indicated that individuals who are employed are more likely to be physically active as compared to unemployed individuals. On the contrary, in a study conducted in Canada, results showed that individuals who are unemployed and not looking for employment are the most likely to be active as compared to those with full time employment (Goechea & Spence, 2003). Colman and Dave (2011) also reported that recreational exercise tend to increase as employment decreases. The findings of the current study are in agreement with these results as a majority of unemployed individuals were active (52.2%). However, Ruhm (2005) have observed that even though unemployment tend to increase the level of PA, the amount of energy expenditure due to employment could be higher than the amount of energy expenditure due to unemployment. Therefore, assessing the levels of PA between individuals who are employed and those who are unemployed should be done with caution. As pointed out by Warburton et al. (2006), it is not necessarily exercise that improves health but rather PA. The different findings could be explained by the difference in the nature of the study and the study sample. In a nutshell, employed hypertensive individuals in Swaziland should therefore be advised to integrate PA in their daily routine.

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### 5.5.2 HEALTH-RELATED FACTORS

Smoking is one of the most important risk factors for CVD such as hypertension and a cause of morbidity and mortality. Scientific evidence to demonstrate that cigarette smoking causes various adverse cardio-vascular events emerged as early as the 1990`s (Menotti et al., 1996).

This finding has been reinforced by the findings of a more recent study which has reported that smoking causes an immediate increase in blood pressure and heart rate that persists for more than 15 minutes after one cigarette and that people who smoke show higher ambulatory blood pressure levels than non-smokers (Mancia et al., 2007). Papathanasiou et al. (2007), has also found that smoking reduces the capacity of the circulatory system which leads to lower exercise tolerance, an acute increase in blood pressure as well as elevated heart rate. This forces muscle cells to switch to an inefficient metabolic process that hampers exercise and prompts the accumulation of lactic acid within the cells (Papathanasiou et al., 2012). In this regard, a study to establish the prevalence of PA among smokers was conducted by DeRuiter, Faulkner, Cairney and Veldhuizen (2008). The authors found that only 22.6% of participants who smoked were physically active. Contrary with the findings of the current study were the majority of smokers was found to be more physically active (50%) as compared to non-smokers (47%). This result is not conclusive as the percentage of smokers in the current study was very small (2.9%) as compared to non-smokers (97.1%). However, it is encouraging to note that only a very small percentage reported smoking. Every effort should thus be made by all the significant role players in Swaziland to maintain or even further reduce the trend of smoking. This can be achieved by encouraging individuals who smoke to participate in regular PA which is also known to be effective in helping individuals to give up smoking (Ussher, Taylor & Faulkner, 2008). Therefore, hypertensive individuals who smoke could benefit from programmes that encourage PA for its double positive effects on smoking cessation and the ultimate goal of having hypertension control (Huang et al., 2008).

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A strong positive correlation between high alcohol consumption and PA exists (Piazza-Gardner & Barry, 2012). This is because alcohol consumption at high levels interferes with cognitive function and impairs physical health leading to inactivity. In addition, excess consumption of alcohol has been consistently shown to have an immediate effect on blood pressure (Chobanian et al., 2003). In individuals who already have hypertension, control of blood pressure to optimum levels is poor (De Gaudemaris et al., 2002).

However, other studies have found moderate consumption of alcohol to be associated with decreased incidence of hypertension (Fuchs, Chambless, Whelton & Heiss, 2001). Huang et al. (2008) has challenged this by reporting that alcohol consumption at any level has detrimental effects on the cardio-vascular system. Although the current study did not measure alcohol consumption levels, it was found that more than half of the study sample who consumed alcohol were categorised as sedentary (55.6%). Therefore, any level of alcohol consumption should be discouraged for all individuals more especially individuals with hypertension. Just like with smoking, individuals should be encouraged to increase PA levels in their daily routine in order to stop alcohol consumption. It is the responsibility of health professionals to identify these individuals in order to advise and support in the process of cessation. However, this is not to say that it is upon health professionals alone, but individuals with hypertension should also take hold of their lives by paying attention to the prescribed interventions in order to leave a health and fulfilled life.

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Recent evidence indicates a direct association between blood pressure and body weight (Appel et al., 2006). According to Wamala et al. (2009), most individuals with hypertension are usually overweight or obese. There is mounting evidence that the current overwhelming prevalence of obesity is more closely related to a decrease in energy expenditure than the imbalance between consumption and expenditure (Sparling et al., 2000). In the current study, more than half of the participants were obese and sedentary levels among the obese were as high as 55.1%. The explanation for a high percentage of obese individuals in the current study could be that, these individuals are not receiving adequate lifestyle modification education (diet and physical activity) and if they do, adherence should be investigated as patient adherence to lifestyle modification is considered to be difficult to initiate and maintain (Cawood, 2006). Therefore, this increase in the prevalence of obesity among individuals with hypertension and increased sedentary lifestyle should call for consented efforts from both the individuals with hypertension and the health care professionals.

In addition, obesity has been implicated as a strong predictor of lack of systolic blood pressure control. Bovet et al. (2000) conducted a study in Dar es Salaam, Tanzania to determine the distribution of blood pressure, body mass index and smoking habits in the urban population and the findings were that body mass index was strongly and independently associated with systolic and diastolic blood pressure. Furthermore, physical inactivity was strongly associated with higher BMIs. The mean body mass index in the current study was 31.89 (SD=6.87). The percentage of participants considered either overweight (body mass index 25-29.9 kg/m2) or obese (body mass index >30kg/m2) was 85.65% which is considerably high than what was reported by STEPS (2007) survey (77.2%). In addition, the obese category was likely to be sedentary. Therefore health promotion programmes should aim to not only increase PA levels but also to decrease weight.

## 5.6 PERCEIVED HEALTH STATUS AND ADVICE RECEIVED

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There is evidence that health professionals can effectively counsel and advise their clients to increase their PA levels through behaviour modification (Bauman, Wright & Brown, 2001). In the current study 64.9% of individuals with hypertension did not receive any PA counselling from their health care providers and poor health is reported by 69.5% of the study sample. Those who had not received PA advice from their health professionals reported poor health and were categorised as being sedentary. This is in agreement with a study conducted by Sobngwi et al. (2001) who reported that good health is associated with an increase in PA levels. Randomised controlled trials have shown that adults can increase their PA and fitness after receiving counselling from their health care providers (Hirvensalo, Heikkinen, Lintunen & Rantanen, 2003). Therefore, health professionals should take an active role in PA counselling of their patients. Studies conducted to evaluate effectiveness of PA counselling have also shown that behaviour change interventions such as motivational interviewing in combination with PA prescription are a sure tool for health care professionals to promote a more physically active lifestyle in individuals with hypertension (Sjoling, Lundberg, Englund, Westman & Jong, 2012).

In the current study, an association was found between general health status and PA advice received ($\chi^2_{(3)}$ = 11.58, P-value = 0.009). With this kind of evidence, health professionals in Mbabane Government Hospital should include PA counselling in their daily routine, especially among patients with CDL such as hypertension.

## 5.7 PERCEIVED BARRIERS TO PHYSICAL ACTIVITY

Many factors that can influence participation in PA negatively have been reported (Lovell et al., 2010; Reichert et al., 2007). In order to develop more successful PA programmes, it is necessary to determine the reasons driving individuals to either adopt sedentary or active lifestyles. In this context, studies on barriers to PA have been conducted in countries such as the United States, Australia, Japan and Brazil (Reichert et al., 2007; Andajani-Sutjahjo, Ball, Warren, Inglis & Crawford, 2004). However, Reichert et al. (2007) have made it clear that the results from these studies differ mainly due to the differences in characteristics of the population under study. For example, lack of money or feeling too tired were the most frequently reported barriers to PA in a Brazilian population (Reichert et al., 2007). While in a Japanese population, time was the most significant perceived barrier (Ishii et al., 2009). It is important to note here that the results with regards to barriers in developing countries are much higher than the ones seen in developed countries (Bowles et al., 2002; Brownson, Baker, Hoiisemann, Brennan & Bacak, 2001). However, lack of time, lack of motivation, poor health conditions, fear of worsening the disease, cultural barriers, lack of family support and lack of awareness are shown to be the common barriers encountered by individuals with hypertension in developing countries (Umuvandimwa, 2011; Kabanda & Phillips, 2011). In the current study, barriers to PA were assessed by using the Exercise Benefits Barrier Scale and the greatest perceived barrier reported were “being fatigued by exercise (72.2%). This finding is similar to the results of a study which was done in the United Kingdom were the study population largely perceived PA as fatiguing and hard work (Lovell et al., 2010).

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In order to overcome this barrier, PA which is practical, convenient and enjoyable should be identified and encouraged. These activities could be incorporated in an individual's daily activities such as work and household chores.

The time factors which were mostly reported in the current study include: exercise takes too much of my time (66.3%), exercise takes too much time from my family responsibilities (61.7%) and exercises takes too much time from family relationships (60%). Rerchert et al. (2007) made similar findings in a study done in Pelotas, Brazil where almost three quarters of the study sample reported lack of time. Lack of time as a barrier could suggest lack of self-motivation rather than a genuine obstacle to regular PA (Bowles et al., 2002). PA that is beneficial to health however does not necessarily need to be planned activities (Halm & Amoako, 2009). A clear distinction must be made between PA and exercise. Exercise has been described as a planned session of PA usually done for personal fitness or health goals (Delisle, Werch, Wong, Bian & Weiler, 2010). According to Plonczynski, Wilbur, Larson and Keith (2008), lifestyle PA is not structured; usually these activities involve a number of activities such as walking, gardening, house chores, or playing with children. Individuals should be encouraged to incorporate these activities in their day to day schedule. This could easily be done at work, home or leisure time. The other barrier which was reported was family support (57.8%). A significant number of studies have reported lack of support from family members as a social barrier to PA (Ishii et al., 2009; Allender, Cowburn & Foster, 2006). This is consistent with the findings of the current study were 57.1% of the study sample reported family support as a barrier to PA. To develop a positive social network for PA, individuals need support and encouragement from family members (Berkman, 2000). Stahl et al. (2001) has added that observing PA patterns of family members could be a motivating factor for individuals to engage in PA. The positive feedback one gets from family members can also motivate individuals to become more physically active. For the individuals with no family support, group PA could be ideal and health professionals should step in to give support. Support from the community members can also make a big difference in inactive individuals.

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In a Malaysian study, Ibrahim, Karim, Oon & Ngah (2013) found that more than 25% of the participants indicated barriers related to exercise facilities. The current study found that 53.2% of the participants reported that exercise facilities do not have convenient time for them while 53.7% reported that places to exercise are too far. This shows that most individuals still perceive exercise as an expensive activity due to the belief that health benefits of PA can only be attained through going to a specific venue, buying expensive equipment or playing certain sports. To this effect, Haskell et al. (2007) has advised that health benefits of PA can be achieved through low to moderate PA that incorporate large muscle groups and these activities include cycling, walking, jogging, swimming and aerobic dance. These types of activities, if done regularly at a light to moderate intensity can bring about a reduction in blood pressure in individuals with hypertension and therefore a key component of lifestyle modification for the prevention and management of hypertension. Therefore, there is a great need for health professionals to enlighten these individuals on the types of PA which have health benefits. Furthermore, health-promotion programmes or interventions should incorporate individual and community education on PA to rectify the misconception about types of beneficial PA.

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## 5.8 PERCEIVED BENEFITS OF PHYSICAL ACTIVITY

According to Buckworth and Dishman (1999), perceived benefits can positively influence individuals to participation in PA. In this regard, a study to identify new approaches to respond to sedentary lifestyle in Europe revealed that most Europeans have sufficient knowledge about lifestyle factors that influence health positively (Zunft et al., 1999). Increased knowledge about the benefit of PA in the prevention and management of CVD were found to be more pronounced in at risk individuals and the individuals who are already affected. The results from a cross-sectional study done in the United States among a non-exercising group of women found similar results where participants agreed with most of the benefits ideas under study (Lovell et al., 2010). Similarly, the current study is in alignment with these findings as most individuals with hypertension agreed to the benefits items.

The only items which participants agreed the least to were "exercise is a good way for me to meet new people" and "my physical endurance is improved by exercise". According to Janz (1984) the likelihood that individuals will engage in a healthy behaviour such as PA largely depends on the degree to which they perceive the barriers and benefits of becoming physically active. Within this context, Vaughn (2009) reported that individuals who perceived more benefits from being physically active and fewer barriers were in a better position to engage in PA than those who reported high perceived barriers and low perceived benefits. In the current study, the fact that most participants agreed to the ideas about benefits of PA and that perceived benefits out-weighed the barriers could imply that they are aware of the benefits of PA. The question then is that why are these individuals not engaging in PA? The most likely reason could be that of lack of motivation from their social networks and most importantly from their health care providers (Berkman, 2000). Therefore, it is of utmost importance that strategies to motivate these individuals at both institutional and community level, are put in place to improve their PA to levels that are beneficial for health. The knowledge about the benefits of PA is a positive finding that will enhance the success of future programmes.

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## SECTION B: HEALTH PROFESSIONALS

### 5.9 PHYSICAL ACTIVITY COUNSELLING PRACTICES

Health professionals have been identified as potentially powerful sources of influence to promote healthy behaviours such as PA as they are strategically positioned to reach a good proportion of individuals through counselling in their day to day practice (McPhail1 & Schippers, 2012; Briffa et al., 2006). In a study conducted by Booth et al. (2000) to determine the most preferred kind of support among inactive Australians, it was found that the most preferred kind of support was to receive appropriate advice with regards to PA from health professionals. Therefore, it seems that patients are willing to listen to the advice from health professionals.

Hinrichs et al. (2011) also reported that health professionals are able to reach a large proportion of patients with chronic diseases as they are likely to be consulted regularly for health problems.

In addition, literature has also pointed out that patients and the general public at large consider the health care system as a reliable institution to provide advice on PA (Rehman et al., 2003). Despite these positive recommendations, medical professionals are still reported to incorporate very little PA counselling into their day to day practice (Glasgow, Eakin, Fisher, Bacak & Brownson, 2001). In a study conducted in the United States, rates of PA counselling of 30%-50% have been reported among health professionals. In another study done in South Korea, the quality of PA counselling among health professionals was 51.1%. In the current study, the response rate being 82%, poor quality PA counselling among health professionals in Mbabane Government Hospital was reported to be as high as 58%. Comparison of the results of the current study with other studies should be done with caution as no high quality physical activity counselling content was reported in the current study.

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Generally in the current study, the ideas mostly included by the majority of health professionals was "discussing the benefits of PA with their patients", "advising patients to become more physically active" and "informing patients on how frequently they should exercise". However, the most significant finding is that health professionals generally did not include the other important components of PA counselling. According to McPhail and Schippers (2012), the benefits of PA are dependent on the intensity, duration and frequency with which it is undertaken. The issue of intensity and frequency of PA were poorly covered by most health professionals. In addition, the health professionals in the current study did not offer PA advice in writing, did not discuss the difficult situations patients might encounter while trying to become physically active and did not discuss PA on each of the visits. From these findings, it appears that, when health professionals do advice about PA, they often stop there with no follow up questions or written prescription. These findings therefore suggest a lack of knowledge with regards to recommendations about exercise that is beneficial for health and a lack of skill to prescribe PA.

Written prescriptions have been found to be a better tool as compared to verbal advice (Swinburn, Walter, Arroll, Tilyard & Russell, 1998).

A number of international organisations have recommended a minimum of five 30-minute sessions of moderate intensity aerobic activity or three 20-minute sessions of vigorous intensity aerobic activity, however, it is important to note here that reducing sedentary time, regardless of how much time is spent in moderate or vigorous PA, has also been associated with reduced mortality (Katzmarzyk, Church, Craig & Bouchard, 2009, WHO, 2004; CDC, 2003). Health professionals should therefore be educated on the international recommendation of PA. The difference in the quality of PA counselling content across different professions was a significant finding. The majority of nurses were poor counsellors of PA (65.0%), similar with the findings of the Brazilian study (Florindo et al., 2013). The doctors and therapist reported the highest moderate quality PA counselling content, 66.7% and 50% respectively. It was surprising to find that doctors have better quality of PA counselling than therapists, contrary to the findings of a study conducted in Canada among health professionals in which therapists were reported to have high quality counselling skills as compared to other health professionals and that their interventions have long term results (Tulloch, Fortier & Hogg, 2006). The general current state of the respondents` skills and knowledge, related to PA recommendations is of serious concern, particularly when most respondents thought they had sufficient knowledge to promote PA. It appears that no pattern or system in the assessment of PA among health professionals exists. It is important that patients receive clear and consistent messages about PA from health professionals. A lack of guidelines or standard protocol to guide health care professionals when they offer counselling to their patients could be a major contributor of poor quality PA counselling as currently health professionals rely on general questions for assessement of individuals with hyperetension.

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An example of such a protocol is the 5As (Ask, Advise, Assess, Assist, Arrange) which is a framework for clinicians to ask about current behaviour, advise change, assess readiness to change, assist with goal-setting, and arrange follow-up. This protocol was formulated for smoking but has been found to be suitable for PA as well (Meriwether, Lee, Lafleur and Wiseman, 2008).

Therefore, the Ministry of Health in Swaziland should see to it that culturally acceptable protocols and guidelines are put in place to motivate the health professionals to offer PA counselling.

## 5.10 ROLE OF HEALTH PROFESSIONALS

According to Wechsler, Levine, Idelson, Schor & Coakley (1996), medical professionals have accepted and value their role of promoting healthy behaviours to their patients. However, they are often faced with a number of challenges in providing lifestyle modification counselling (Yarnall et al., 2002). The commonly reported barriers in literature which are attributed to lack of PA counselling are factors such as: lack of time, knowledge, training, materials, protocols, system support, resources, incentives and reimbursement as well as perception of PA counselling as a secondary task or ineffective, and that patients ignore or are not interested in the advice (Bock, Diehm & Schneider, 2012; Schmid, Eglik, Martin & Bauer, 2009). For the purposes of this study only lack of time, lack of knowledge, not my area of specialty and not believing in the benefits of PA will be considered.

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### 5.10.1 Area of specialty

The best practice for management of CDL involves a multidisciplinary approach. Therefore, the responsibility of motivating the patients to engage in more PA is shared by several health professionals (Persson, Brorsson, Hansson, Troein & Strandberg, 2013). A good number of health professionals in the current study across all occupations indicated “not my area of specialty” as a reason for not discussing PA with their clients. It was reported as a reason among 66.7% nurses, 40% therapists and 20% doctors.

The fact that physical inactivity is a major risk factor for CDL, modern trends in the management of these diseases mandate all health professionals at all levels to be involved if this battle is to be won, therefore training is vital. In this context, Florindo et al. (2013) has highlighted that health professionals who are trained are most likely to provide PA counselling to their patients. However, the differences among health professionals in PA counselling is not surprising given the different levels of knowledge and remuneration.

In addition, PA is considered to be a specialised scope by a number of health professionals (Douglas, Torrance, van Teijlingen, Meloni & Kerr, 2006). Health professionals also feel that PA counselling is an extra workload that demands extra remuneration as there are health professionals such as physiotherapists who are trained to do so. Considering PA counselling as being a specialised area translates into health professionals not knowing their role with regard to health promotion in the prevention and management of CDL. Therefore, this calls for the training of all health professionals on health promotion strategies. Correcting the anomalies highlighted above will require an intervention from policy makers. Meanwhile, health professionals should be provided with training in order to be motivated to include PA counselling in their daily activities with patients.

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### 5.10.2 Lack of time

Lack of time is a frequently reported PA counselling barrier identified by a number of studies (Hebert, Caughy & Shuval, 2012; Petrella & Wright, 2000). In a study conducted among health professionals in Australia, the time factor was identified as the most significant barrier to PA counselling (Rehman et al., 2003). Similarly, the current study has revealed lack of time as a constraint for health professionals, especially among doctors (80%) and nurses (60.0%). In a similar study, doctors and nurses from Scotland and South Africa also cited lack of time as their main reason for not providing PA counselling to the patients (Parker, Steyn, Levitt & Lombard, 2010; Douglas et al., 2006).

It is worth noting here that it is clear that medical doctors and nurses in a hospital setting see a large number of patients on a daily basis. In a study done in Denmark, it was found that doctors and nurses are consulted by approximately 85% of the population over a one-year period (Van Doorslaer et al., 2006; Lucas et al., 2004). Judging from the burden of diseases Swaziland is facing, consultations could even be more than those seen in Denmark. It is therefore justified that medical doctors and nurses in Mbabane government hospital may have limited time to incorporate comprehensive PA counselling in their daily schedule.

Despite being faced with serious human resource shortages, Mbabane Government Hospital is the main referral hospital which runs specialised clinics for CDL and at the same time attends to walk-in patients from different parts of the country, creating an overload. For this reason health professionals are subjected to dealing with long queues on a daily basis which might lead to the failure to incorporate PA in their treatment sessions. This requires strengthening of the referral system in the country so that only patients who need specialised care can be attended to at Mbabane Government Hospital. In a study done in Brazil, a relationship was found between time constraints and workload (Florindo et al., 2013). The most notable findings in the Brazilian study was that, as the weekly patient case load increased, the prevalence of reported lack of time for regular PA counselling as a barrier also increased among health professionals. This finding suggests that seeing an excessive number of patients per week has a direct impact on PA counselling. To ease such challenges, involvement of other health professionals such as physiotherapists who are uniquely suited to educate people about PA is recommended (Leinonen et al., 2007). Therapists tend to spend a lot of time with their patients in their daily practice which puts them in a better position to discuss PA. This in part could explain why the time factor was not a major constraint among therapists. However, this is in no way to undermine the importance of team work and should not encourage other professionals to totally detach themselves from PA counselling practices.

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In addition, the challenge of time could also be alleviated by improving human resources as there are serious shortages in all the departments of Mbabane Government Hospital. It would therefore be appropriate to engage doctors, nurses, therapists and other health professionals in PA counselling so that the workload is shared. A multidisciplinary approach that addresses the individual needs of the patient would offer a better chance for long-term effectiveness.

### 5.10.3 Knowledge

Even if health professionals have the time to offer PA counselling, they often lack the knowledge including lack of knowledge of the types of PA, frequency, duration and the intensity. In addition, lack of knowledge may also imply that health professionals may not be conversant with writing a PA prescription. Lack of knowledge in this study was only reported by nurses (9.5%), even though the questions about the frequency, duration and intensity were not answered by most health professionals. Similarly, a Scottish study also showed that few health professionals had adequate knowledge to cover the important components of PA counselling (Douglas et al., 2006). The lack of knowledge is a problem that should be linked to academic training programmes. Swaziland does not have its own medical school therefore relies on neighbouring countries for its training needs. A programme to train and keep health professionals abreast with current trends should therefore be put in place to overcome this barrier.

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## 5.11 Summary

Chapter Five compared and contrasted the findings of the current study with previous similar studies. It was highlighted that individuals with hypertension are not engaging in sufficient PA as per recommendation by public health research. In addition, health professional's PA counselling practices are of poor quality. The implications of inactivity on hypertension and the inability of health professionals to effectively counsel their patients were also discussed. The following chapter summarises and concludes the study. Recommendations for stakeholders and further studies are also discussed.

# CHAPTER SIX

# SUMMARY, SIGNIFICANCE, CONCLUSION, RECOMMENDATIONS AND LIMITATIONS

## 6.1 INTRODUCTION

This final chapter provides a summary and conclusion of the study. Recommendations based on the findings of this study are also provided.

## 6.2 SUMMARY AND CONCLUSION

The aim of this study is to determine the PA participation among adults with hypertension in Mbabane, Swaziland and the extent to which they are encouraged to be physically active by health professionals. To achieve this, levels of PA were measured and the associated factors were analysed. Furthermore, the benefits of and barriers to PA were determined and the health professionals counselling practices were examined.

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Scientific evidence has recognised the importance of hypertension as a leading cause of CVD morbidity and mortality globally. Moreover, the proportion of hypertension in developing countries is as high as, sometimes even more than the ones reported in developed countries. The prevalence of hypertension is propelled by physical inactivity brought about by demographic, economic and social factors, of which urbanisation, industrialisation, and globalisation are the main determinants. While PA to a great extent contributes to the development of CDL such as hypertension, there is overwhelming evidence with regards to the effectiveness of positive lifestyle modifications, which includes increased PA. PA is predominantly a recommended strategy because of its multi-factorial effect on other CVD risk factors as well as it being a cost effective intervention with very few adverse side effects if undertaken according to scientifically proven guidelines.

Health professional`s counselling and advice on PA is the best established PA intervention as long as it is tailored to meet an individual`s needs and abilities. For this reason, health professionals have been identified as key players in encouraging and influencing healthy lifestyles such as PA promotion and awareness as they are strategically positioned and have access to a good proportion of individuals with CDLs. The rationale for this study was to determine if individuals with hypertension are participating in sufficient levels of PA for health benefits as well as to assess how much PA advice health professionals incorporate in their daily routine as they deal with their clients. It is hoped that the results of this study will help in developing effective programmes to motivate individuals with hypertension and the high risk groups to increases the levels of PA in order to meet public health PA recommendations of 30 minutes or more of moderate intensity. In addition, the results will also establish a foundation for evidence based practice which is necessary in the planning and implementation of PA interventions.

Mbabane Government (referral) Hospital which is located in the capital city of Swaziland was chosen as the research setting. A cross-sectional design utilising quantitative methods was used to determine PA participation among adults with hypertension and the extent to which they are encouraged to become physically active. Data from both hypertensive individuals and health professionals was collected using valid and reliable questionnaires. The study sample included 410 hypertensive individuals and 59 health professionals. Data was analysed using the Statistical Package for Social Sciences (SPSS) version 21. Descriptive statistics was used to summarise the levels of PA as well as the socio-demographic and health-related factors, while inferential statistics was used to test the association between these factors and the levels of PA.

With regard to individuals with hypertension, participants` age ranged from 24 to 65 years with a mean age of 54.08 (SD=8.81). The majority of individuals with hypertension (64.4%) did not receive advice with regards to exercise and most reported poor health (65.9%).

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The International Physical Activity Questionnaire (IPAQ) was used to assess the levels of PA among hypertensive individuals. The results of the study showed that the majority 52.9% of the study sample was considered sedentary. Age, systolic and diastolic blood pressure were found to be significantly associated with PA (P-value < 0.05). In addition, an association between health status and advice received was also found.

The Exercise Benefits Barrier Scale Questionnaire was used to assess the benefits of and barriers to PA participation. The most reported barrier to PA participation among hypertensive individuals was "fatigue and the time factors". With regard to benefits, most individuals demonstrated good knowledge about the benefits of PA. The commonly reported benefits were "improved cardio-vascular system and body image".

The Health professionals age ranged from 24 to 62 years, with a mean age of 38.2 (SD= 9.76). The majority of participants were nurses (67.8%) and 59.3% of the participants had obtained a degree. The mean years of experience of the study sample was 12.8 (SD = 9.34). The Physical Activity Interview Exit Questionnaire (PAIE) was used to assess PA counselling practices of health professionals. The results of the study revealed that the majority of participants (58%) were categorised as having poor quality physical activity counselling content. The most used counselling ideas of PA were: discussing PA (88.1%), advice to become more physically active (76.3%) and advice on how frequently they should exercise (73.6%).

The current levels of PA among hypertensive individuals, the knowledge as well as the quality of PA counselling practices among health professionals is of great concern, particularly because individuals with hypertension thought they were accumulating sufficient levels of PA while the health professionals thought they had adequate knowledge to counsel their patients on matters regarding PA. These findings are consistent with results from similar studies done in various countries globally.

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The increased levels of physical inactivity in developing countries such as Swaziland in particular should attract serious attention from Policy makers and health professionals. PA as an independent strategy has a significant impact in the prevention and management of hypertension or can be used as an adjunct to medication and other treatments, therefore a corner stone for public health. Policy makers should thus be persuaded to invest in both scientifically proven strategies and further research. Meanwhile, health professionals should invest in time to discuss PA with their clients. In addition, strategies aimed at prevention and management of hypertension should also attract strong political involvement in light of the fact that Swaziland like most developing countries, is currently battling with communicable diseases such as tuberculosis and HIV/AIDS with limited resources and health budgets. It is therefore hoped that the information gathered from this study will help to inform individuals with hypertension, health professionals and policy makers on the need to utilise PA as a cost effective strategy in preventing and managing hypertension.

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## 6.3 STRENGTHS

The study achieved reasonable response rates for both individuals with hypertension and health professionals, i.e. 97% and 82% respectively. Questionnaires which have been shown to be reliable and valid for the African context were used for data collection. In addition, pilot studies were undertaken to further ensure reliability and validity. Systematic random sampling which was used to select hypertensive individuals and the inclusion of all health professionals gave the participants an equal chance to participate, limiting bias.

## 6.4 RECOMMENDATIONS

- The role of health professionals in promoting PA should be emphasised. In order for the health professionals to be fully motivated and effective in encouraging and supporting individuals with hypertension to became physically active to public health recommended levels, policy makers and health professionals need to engage in efforts to improve the knowledge of current PA as well as consider the development of standardised protocols and guidelines to support individual assessment and advice.

- In the interim, the physiotherapy department should be of great importance to the facility, not only in secondary but also in primary prevention. Health education and health promotion are an integral component of the physiotherapist profession. Therefore, physiotherapists can offer valuable advice to the rest of the health team on PA prescription covering all areas including the types, intensity, frequency and duration of beneficial PA. In addition, physiotherapists should also be involved in designing programmes for PA promotion. However, in order for the physiotherapy department to be effective, human resources should be improved. Furthermore, the issue of reimbursement of all health professionals involved in PA counselling should be seriously looked into.

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- Management and prevention of hypertension should not be treated as an individual problem but all strategies should be societal in nature. Therefore, peer motivation specifically by family members and friends who share the same challenges in dealing with hypertension would be a major factor in promoting healthy lifestyles through the promotion of PA. Support groups within the communities would be of great benefit and should be encouraged. Furthermore, the groups who are not accumulating sufficient PA levels can be motivated by group PA. Therefore, significant role players of Mbabane Government Hospital should consider setting aside some space within the premises for these groups.

- Integration of PA in work, home, transport and recreation domains should be encouraged to overcome the barriers of lack of time and motivation. Physical activity should be incorporated into individual's daily routine especially the individual's valued activity. Infrastructural suitability such as level playing grounds, pedestrian pavements besides main roads and security is also recommended. The government should therefore look into improving the available infrastructure and establishing recreational facilities to promote PA participation.

- Media messages on PA should not only target the general population but should also be tailored for those who already have hypertension and the high risk groups. In addition, education material in the form of pamphlets, brochures and posters should be made available in the facility to increase hypertension and PA awareness and promotion.

## 6.5 FURTHER STUDIES

The study of hypertension and PA is broad. Another study which combines both quantitative and qualitative study designs (Triangulation) could be conducted among patients with other CDL for a deeper insight into the PA participation and PA counselling practices. In addition, it would also be interesting to know the effectiveness of a multi-disciplinary team in PA promotion.

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## 6.6 LIMITATIONS OF THE STUDY

- The study was a cross-sectional study therefore causal inferences cannot be made. Caution should be exercised in interpreting the results in the absence of longitudinal data.

- Due to self-reported data, a bias may have occurred when assessing physical activity levels of hypertensive individuals and some individuals might have lied about their physical activity pattern or exaggerated the report.

- The questionnaires consisted of close-ended responses. This limited the study to gain deeper information on physical activity participation patterns. A mixed methods study could have produced better results.

- The questionnaire requested the participants to recall their physical activity pattern in the last 7 days that could have encouraged recall bias, which may also represent sources of error.

- A narrow choice of responses (Yes /No) for the PAEI questionnaire might have limited health professional`s responses. An addition of "always and sometimes" could have given more choice for health professionals.

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## APPENDIX A

### QUESTIONNAIRE FOR ADULT HYPERTENSIVE INDIVIDUALS

Dear participant,

Please answer the questions as instructed in every section. Do not write your name on the questionnaire.

Give your answer by **ticking (√)** in the boxes, **circling** or providing **information** in the spaces provided.

### SECTION A: SOCIO-DEMOGRAPHIC INFORMATION.

1. How old are you?
   - ☐ **Years**
   - ☐ **Birth year**

2. What is your gender?
   - ☐ **Male**
   - ☐ **Female**

3. Where do you stay? ☐

4. What is your Region?
   - ☐ **Hhohho**
   - ☐ **Shiselweni**
   - ☐ **Lubombo**
   - ☐ **Manzini**

5. What is your marital status?
   - ☐ **Single**
   - ☐ **Married**
   - ☐ **Divorced**
   - ☐ **Co-habiting**

6. What is your highest education?
   - ☐ **Primary**
   - ☐ **Secondary**
   - ☐ **High School**
   - ☐ **Tertiary**
   - ☐ **None**

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7. What is your employment status level?
   - ☐ **Employed full time**
   - ☐ **Employed part time**
   - ☐ **Unemployed**
   - ☐ **Pensioned**
   - ☐ **Other** _____

8. Do you smoke cigarettes?
   - ☐ **Yes**
   - ☐ **No**

9. Do you take alcohol?
   - ☐ **Yes**
   - ☐ **No**

***OFFICIAL USE***

| | |
|---|---|
| Blood pressure | **mm/Hg** |
| Height | **meter** |
| Weight | **kgs** |
| Body mass index | **kg/m$^2$** |

**SECTION B: THE FOLLOWING QUESTIONS ASK ABOUT YOUR HEALTH AND PHYSICAL ACTIVITY ADVICE RECEIVED.**

1. Considering you having hypertension, how would you describe your general health?

- ☐ **Excellent**
- ☐ **Very good**
- ☐ **good**
- ☐ **Fair**
- ☐ **poor**

2. Has your health care provider advised you to follow an exercise programme?

- ☐ **Yes**
- ☐ **No**

**SECTION C: INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE (IPAQ)**

In this section, we are interested in finding out about the kinds of physical activities that you do as part of your everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

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Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think ***only*** about those physical activities that you did for at least 10 minutes at a time.

**1.** During the **last 7 days,** on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

_____ **Days per week**

☐ No vigorous physical activities ➡ **Skip to question 3**

**2.** How much time did you usually spend doing **vigorous** physical activities on one of those days?

_____ **Hours per day**

_____ **Minutes per day**

☐ Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days. Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

**3.** During the **last 7 days,** on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

____ **Days per week**

☐ No moderate physical activities ➡ **Skip to question 5**

**4.** How much time did you usually spend doing **moderate** physical activities on one of those days?

____ **Hours per day**

____ **Hours per day**

☐ Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days.** This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

**5.** During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

____ **Days per week**

☐ No walking ➡ **Skip to question 7**

**6.** How much time did you usually spend **walking** on one of those days?

____ **Hours per day**

____ **Minutes per day**

☐ Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days.** Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

**7.** During the **last 7 days**, how much time did you spend **sitting** on a week day?

____ **Hours per day**

____ **Minutes per day**

☐ Don't know/Not sure

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**SECTION D: EXERCISE BENEFITS/BARRIERS SCALE (EBBS)**

DIRECTIONS: Below are statements that relate to ideas about exercise. Please indicate the degree to which you agree or disagree with the statements by circling SA for strongly agree, A for agree, D for disagree, or SD for strongly disagree.

| | STRONGLY AGREE | AGREE | DISAGREE | STRONGLY DISAGREE |
|---|---|---|---|---|
| 1. I enjoy exercise. | **SA** | **A** | **D** | **SD** |
| 2. Exercise decreases feelings of stress and tension for me. | **SA** | **A** | **D** | **SD** |
| 3. Exercise improves my mental health. | **SA** | **A** | **D** | **SD** |
| 4. Exercising takes too much of my time. | **SA** | **A** | **D** | **SD** |
| 5. I will prevent heart attacks by exercising. | **SA** | **A** | **D** | **SD** |
| 6. Exercise tires me. | **SA** | **A** | **D** | **SD** |
| 7. Exercise increases my muscle strength. | **SA** | **A** | **D** | **SD** |
| 8. Exercise gives me a sense of personal accomplishment. | **SA** | **A** | **D** | **SD** |
| 9. Places for me to exercise are too far away. | **SA** | **A** | **D** | **SD** |
| 10. Exercising makes me feel relaxed. | **SA** | **A** | **D** | **SD** |
| 11. Exercising lets me have contact with friends and persons I enjoy. | **SA** | **A** | **D** | **SD** |
| 12. I am too embarrassed to exercise. | **SA** | **A** | **D** | **SD** |
| 13. Exercising will keep me from having high blood pressure. | **SA** | **A** | **D** | **SD** |
| 14. It costs too much to exercise. | **SA** | **A** | **D** | **SD** |
| 15. Exercising increases my level of physical fitness. | **SA** | **A** | **D** | **SD** |
| 16. Exercise facilities do not have convenient schedules for me. | **SA** | **A** | **D** | **SD** |
| 17. My muscle tone is improved with exercise. | **SA** | **A** | **D** | **SD** |
| 18. Exercising improves functioning of my cardiovascular system. | **SA** | **A** | **D** | **SD** |
| 19. I am fatigued by exercise. | **SA** | **A** | **D** | **SD** |

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| | | | | |
|---|---|---|---|---|
| 20. I have improved feelings of well-being from exercise. | **SA** | **A** | **D** | **SD** |
| 21. My spouse (or significant other) does not encourage exercising. | **SA** | **A** | **D** | **SD** |
| 22. Exercise increases my stamina. | **SA** | **A** | **D** | **SD** |
| 23. Exercise improves my flexibility. | **SA** | **A** | **D** | **SD** |
| 24. Exercise takes too much time from family relationships. | **SA** | **A** | **D** | **SD** |
| 25. My disposition is improved with exercise. | **SA** | **A** | **D** | **SD** |
| 26. Exercising helps me sleep better at night. | **SA** | **A** | **D** | **SD** |
| 27. I will live longer if I exercise. | **SA** | **A** | **D** | **SD** |
| 28. I think people in exercise clothes look funny. | **SA** | **A** | **D** | **SD** |
| 29. Exercise helps me decrease fatigue. | **SA** | **A** | **D** | **SD** |
| 30. Exercising is a good way for me to meet new people. | **SA** | **A** | **D** | **SD** |
| 31. My physical endurance is improved by exercising. | **SA** | **A** | **D** | **SD** |
| 32. Exercising improves my self-concept. | **SA** | **A** | **D** | **SD** |
| 33. My family members do not encourage me to exercise. | **SA** | **A** | **D** | **SD** |
| 34. Exercising increases my mental alertness. | **SA** | **A** | **D** | **SD** |
| 35. Exercise allows me to carry out normal activities without becoming tired. | **SA** | **A** | **D** | **SD** |
| 36. Exercise improves the quality of my work. | **SA** | **A** | **D** | **SD** |
| 37. Exercise takes too much time from my family responsibilities. | **SA** | **A** | **D** | **SD** |
| 38. Exercise is good entertainment for me. | **SA** | **A** | **D** | **SD** |
| 39. Exercising increases my acceptance by others. | **SA** | **A** | **D** | **SD** |
| 40. Exercise is hard work for me. | **SA** | **A** | **D** | **SD** |
| 41. Exercise improves overall body functioning for me. | **SA** | **A** | **D** | **SD** |
| 42. There are too few places for me to exercise. | **SA** | **A** | **D** | **SD** |
| 43. Exercise improves the way my body looks. | **SA** | **A** | **D** | **SD** |

***This is the end of the questionnaire, thank you for participating.***

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**APPENDIX B**

**QUESTIONNAIRE FOR HEALTH PROFESSIONALS**

Dear participant,

We are interested in knowing your physical activity counselling practices. Please answer the questions as instructed in every section. Do not write your name on the questionnaire. Give your answer by ticking **(√)** in the boxes or providing information in the spaces provided.

**SECTION A: SOCIO-DEMOGRAPHIC INFORMATION.**

1. How old are you? ☐ **Years**

2. What is your gender?
☐ **Male**
☐ **Female**

3. What is your level of education?
☐ **Cert**
☐ **Diploma**
☐ **Degree**
☐ **Msc**
☐ **Other** _____

4. What is your occupation?
☐ **Doctor**
☐ **Nurse**
☐ **Dietician**
☐ **Other** _____

5. What is your number of years of practice?
☐ **Months**
☐ **Years**

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**SECTION B: PHYSICAL ACTIVITY EXIT INTERVIEW QUESTIONNAIRE**

Below are some physical activity ideas that can be discussed between you and the patient. Please answer either **YES** or **NO** by indicating with a tick **(√).**

| | QUESTION | YES | NO |
|---|---|---|---|
| 1 | Do you discuss the topic of physical activity with your patients? | | |
| 1a | If **(1**) above is **NO**, give a reason:<br>Lack of time ☐ Not my area of specialty ☐<br>Lack of knowledge ☐ It does no ha e health benefits ☐ | | |
| 2 | Do you advise your patients to become more physically active? | | |
| 3 | Do you discuss the benefits of physical activity with your patients? | | |
| 4 | Do you discuss with your patients on their past experiences with physical activity? | | |
| 5 | Do you discuss the difficult situations patients might encounter or problems they might have in trying to become more physically active? | | |
| 6 | Do you inform your patients on how **FREQUENTLY** they should exercise? | | |
| 7 | Do you inform your patients on how **LONG** they should exercise? | | |
| 8 | Do you inform your patients on how **HARD** they should exercise? | | |
| 9 | Do you inform your patients on the **TYPES** of exercise they should do? | | |
| 10 | Do you and your patient put the plan to become more physically active in Writing? | | |
| 11 | Do you give any written materials about physical activity or exercise during each day's clinic visit? | | |
| 12 | Do you state to the patients that you are planning to discuss their physical activity on a future visit? | | |

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**APPENDIX C**

**UNIVERSITY OF THE WESTERN CAPE**

Private Bag X 17, Bellville 7535, South Africa

*Tel:* +27(021)959-2542, *Fax:* +27(021)959-2542

## CONSENT FORM

**Title of Research Project:** Physical activity participation among adults with hypertension in Mbabane-Swaziland.

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

| | | | |
|---|---|---|---|
| **Participant's name:** | _____ | **Witness:** | _____ |
| **Study ID :** | _____ | **Signature:** | _____ |
| **Signature/ Thumb print:** | | | |
| **Date:** | _____ | **Date:** | _____ |

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

**Prof. Julie Philips**

**University of the Western Cape**

**Private Bag X17, Belville 7535**

***Tel:* +27(021)959-2542**

**Cell: +27729921549**

**Email: jphillips@uwc.ac.za**

**APPENDIX D**

**NIVERSITY OF THE WESTERN CAPE**

Private Bag X 17, Bellville 7535, South Africa

*Tel:* +27(021)959-2542, *Fax:* +27(021)959-2542

**INFORMATION SHEET**

**Project Title**: Physical activity participation among adults with hypertension in Mbabane – Swaziland.

**What is this study about?**

This is a research project being conducted by **SHARON MASONA** from the University of the Western Cape.You are invited to participate in this research project because you are among the hypertensive individuals receiving treatment at the Mbabane Government Hospital or you are directly involved in the management of hypertensive individuals. The purpose of this research project is to determine physical activity participation among adults with hypertension in Mbabane-Swaziland and the extent to which they are encouraged to be physically active. The information from this study will be useful in informing individuals with hypertension, health professionals and policy makers on the need to utilize physical activity as a cost effective strategy in managing and preventing hypertension. It will also establish a foundation for evidence based practice which will help health professionals improve or implement hypertension prevention strategies.

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

You will be required to sign a written informed consent if you do agree to participate in this study before participating. As an individual with hypertension, you will be asked to complete two closed ended questionnaires either in English or siSwati, giving information regarding how much physical activity you are involved in, the time you spend in these physical activities, the benefits of and barriers to your participation in physical activity.

As a health professional you will be required to complete one closed ended questionnaire in English, giving information regarding your counseling practices in managing hypertension. The questionnaires require ticking or circling the answer which best describe your answer to the question. If you are an individual with hypertension, you will be seen after consulting your medical practitioner at the hypertensive clinic and if you are a health professional you will be seen at your convenient time and place.

**Would my participation in this study be kept confidential?**

We will do our best to keep your personal information confidential. To help protect your confidentiality, there will be no individual names on the questionnaire and other information that personally identify you. If a report is written or an article is published about this research project, your identity will be protected to the maximum extent possible.

**What are the risks of this research?**

There are no known risks associated with participating in this research project.

**What are the benefits of this research?**

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This research is not designed to help you personally, but the results may help the researcher learn more about the need for physical activity in promoting health among hypertensive individuals. We hope that, in the future, other people might benefit from this study through improved understanding of the need for promoting physical activity in combating hypertension.

**Describe the anticipated benefits to science or society expected from the research, if any.**

The study will help in promoting physical activity among hypertensive individuals and encourage health professionals to offer physical activity counseling when managing hypertension in Mbabane government hospital- Swaziland.

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

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time.

If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefit to which you otherwise qualify.

**Is any assistance available if I am negatively affected by participating in this study?**

In case of any complication to you during the study, you will be advised to seek or you will be referred to proper health care providers for further treatment and counselling at no cost.

**What if I have questions?**

This research is being conducted by **SHARON MASONA** from the Physiotherapy department at the University of the Western Cape. If you have any questions about the research study itself, please contact

**SHARON MASONA** at: University of Western Cape, Cape Town, South Africa, Phone: +27735313540/+26878211850, Email: smasona@yahoo.co.uk. Or

**Prof. Julie Philips**

**University of the Western Cape**

**Private Bag X17, Bellville 7535.**

**Telephone number: +2721959 2542**

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**E-mail address: jphilips@uwc.ac.za**

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

**Head of Department:**

**Dean of the Faculty of Community and Health Sciences:**

**University of the Western Cape**

**Private Bag X17**

**Bellville 7535**

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

## APPENDIX E

**LUHLU LWEMIBUTO LOLUBHEKISWE KUBANTFU LABADZALA LABANESIFO SEKUPHAKAMA KWENGATI.**

Wena wekunene,

Phendvula imibuto njengoba ibutiwe kuletigaba letehlukene. Ungabhali libito lakho kuleliphepha lemibuto. Niketa imphendvulo yakho ngekumaka **(√)** ebhokisini noma ukipilitele noma ubhale imphendvulo etikhaleni letiseceleni.

**SIGABA A: IMIBUTO LEPHATSELENE NEKUPHILA KWAKHO**

1. Uneminyaka lemingakhi?
   - ☐ **Iminyaka**
   - ☐ **Umnyaka wekutalwa**

2. Bulili bakho?
   - ☐ **Wesilisa**
   - ☐ **Wesifazane**

3. Uhlalaphi? ☐

4. Ngusiphi sifundza sakho?
   - ☐ **Hhohho**
   - ☐ **Shiselweni**
   - ☐ **Lubombo**
   - ☐ **Manzini**

5. Ushadile noma cha?
   - ☐ **Angikashadi**
   - ☐ **Ngishadile**
   - ☐ **Ngingumfelokati**
   - ☐ **Ngidivosile**
   - ☐ **Nginamasihlalisane**

6. Ugcine kusiphi sigaba sekufundza?
   - ☐ **e-Primary**
   - ☐ **e-Secondary**
   - ☐ **e-High School**
   - ☐ **e-Tertiary**
   - ☐ **Kute**

7. Uyasebenta yini noma cha?
   - ☐ **Ngicashiwe**
   - ☐ **Ngicashiwe kwesikhashane**
   - ☐ **Angisebenti**
   - ☐ **Ngipenishelwe**
   - ☐ **Lokunye** _____

8. Uyalibhema ligwayi?
   - ☐ **Yebo**
   - ☐ **Cha**

9. Uyabunatsa tjwala?
   - ☐ **Yebo**
   - ☐ **Cha**

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***OFFICIAL USE***

| | |
|---|---|
| i-Blood pressure | **mm/Hg** |
| Budze | **meter** |
| Sisindvo | **kgs** |
| Budlelwane besisindvo nebudze | **kg/m$^2$** |

**SIGABA B: LEMIBUTO LELADZELAKO IBUTA MAYELANA NEMPILO YAKO NETELULEKO TEKUSHUKUMA LOKE WATITFOLA.**

1. Njengoba unesifo sekuphakama kwengati, ungayichaza utsi injani imphilo yako?
   - ☐ Yinhle ngalokucicimako
   - ☐ Yinhle kakhulu
   - ☐ Yinhle
   - ☐ Ikahle
   - ☐ Ikabi

2. Umnakekeli wakho uke wakweluleka yini ngekutsi ube neluhlelo lwekushukumisa umtimba?
   - ☐ Yebo
   - ☐ Cha
   - ☐ Angisakhumbuli

**SIGABA C: INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE (IPAQ)**

Kulesigaba lesi, singatsandza kwati ngetinhlobo tekushukuma lotentako imihla nemalanga. Sitakubuta mayelana nesikhatsi losisebentise ekushukumeni kulamalanaga **lasikhombisa lendlulile.** Phendvula yonkhe imibuto noma ngabe awusiye umuntfu loshukumako. Cabangisisa ngekushukuma lokwentako emsebentini, endlini yakho noma wenta umsebenti wasebaleni lakho, lekwenta usuke endzaweni letsite uye kulenye noma ngesikhatsi sakho sekuphumula, sekutivocavoca noma semidlalo.

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Cabangisisa ngako konkhe lokwentile lokufaka ekhatsi kushukuma **ngemandla** kulamalanga **lasikhombisa lendlulile**. Kushukuma ngemandla kufaka ekhatsi yonkhe imisebenti ledzinga tikhwepha, lekwenta uphefumule kamatima kunasemihleni. Cabanga ***kuphela*** ngekushukuma lokutsetse lokungenani imizuzu lelishumi sikhatsi sisinye.

1. Kulamalanga **lasikhombisa lendlulile**, kukangakhi ushukuma ngekwenta **imisebenti lematima** njengekuphakamisa tintfo letesindzako, kugubha, kutivocavoca noma kushova libhayisikili ngemandla?

____ **Ngeliviki**

☐ Angikase ngashukuma ngemandla ➡ **Chubekela kumbuto 3**

2. Singakanani sikhatsi lebewuvamise kusisebentisa ushukuma **ngemandla** ngelilanga?

____ **Wemahora ngelilanga**

____ **Wemimizuzu ngelilanga**

☐ Angati/Anginaso siciniseko

Ake ucabange ngako konkhe kushukuma **lokungadzingi kakhulu emandla** lokwente **kulamalanga lasikhombisa lendlulile**. Kushukuma lokungadzingi kakhulu emandla nguloko lokudzinga emandla lamancane kodvwa lokukwenta uphefumule kakhudlwana kunalokujwayelekile. Cabanga ngekushukuma lokutsetse lokungenani imizuzu lelishumi ngesikhatsi lesitsite.

3. Kulamalanga **lasikhombisa lendlulile**, kukangakhi **ushukuma kancane** ngekwenta imisebenti lenjengekutfwala imitfwalo lelula, kushova libhayisikili ngesineke noma udlala ibhola yemphebeto? Ungakufaki ekhatsi kuhamba.

____ **Wemalanga ngeliviki**

☐ Angikase ngashukuma kancane ➡ **Chubekela kumbuto 5**

4. Bewuvamise kutsatsa sikhatsi lesingakanani **ushukuma kancane** ngelilanga?

____ **Wemahora ngelilanga**

____ **Wemizuzu ngelilanga**

☐ Angati/ngite siciniseko

Ake ucabange sikhatsi losisebentise **uhamba kulamalanga lasikhombisa lendlulile**. Loku kufaka ekhatsi kuhamba usemsebentini, ekhaya, usuka endzaweni lenye uya kulenye noma ngukuphi ke kuhamba kwekutilibatisa, kudlala, kutivocavoca noma kutijabulisa.

5. Kulamalanga **lasikhombisa lendlulile**, mangakhi emalanga lapho **uhambe** khona lokungenani imizuzu lelishumi ungaphumuli?

____ **Wemalanga ngeliviki**

☐ Angikase ngahamba ➡ **Chubekela kumbuto 7**

6. Bewuvamise kusebentisa sikhatsi lesingakanani uhamba ngelilanga?

____ **Wemahora ngelilanga**

____ **Wemizuzu ngelilanga**

☐ Angati/Ngite siciniseko

Umbuto wekugcina umayelana nesikhatsi lositsetse uhleti ekhatsi neliviki **kulamalanga lasikhombisa lendlulile**. Ngabe bewuhleti emsebentini, ekhaya, wenta umsebenti wesikolwa noma ungcebelekile. Loku kungafaka ekhatsi sikhatsi lositsetse uhleti etafuleni, uvakashele bangani, ufundza, uhleti noma ulele phansi ubukela mabonakudze.

7. Kulamalanga **lasikhombisa lendlulile**, singakanani sikhatsi lositsetse uhleti ekhatsi neliviki?

____ **Wemahora ngelilanga**

____ **Wemizuzu ngelilanga**

☐ Angati/Ngite siciniseko

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**SIGABA D: SIKALI SENZUZO/BULUKHUNI BEKUSHUKUMA PHECELETI** Lokulandzelako ngimilayeto lehambisana nemicondvo yekushukuma. Khombisa indlela lovumelana noma longavumelani ngayo nalemicondvo ngekutsi ukipilitele **SA** nangabe uvuma kakhulu, **A** uma uvuma, **D** nangabe awuvumi, noma **SD** nangabe awuvumi mbamba.

| | STRONGLY AGREE | AGREE | DISAGREE | STRONGLY DISAGREE |
|---|---|---|---|---|
| 1. Ngiyakutsandza Kushukumisa umtimba | **SA** | **A** | **D** | **SD** |
| 2. Kushukumisa umtimba kwehlisa lizinga lekucabanga kakhulu. | **SA** | **A** | **D** | **SD** |
| 3. Kushukumisa umtimba kucinisa kusebenta kahle kwengcondvo yami | **SA** | **A** | **D** | **SD** |
| 4. Kushukumisa umtimba kutsatsa sikhatsi sami lesinyenti | **SA** | **A** | **D** | **SD** |
| 5. Ngitawuvikela kubulawa sifo senhlitiyo ngekushukumisa umtimba. | **SA** | **A** | **D** | **SD** |
| 6. Kushukumisa umtimba kungicedza emandla. | **SA** | **A** | **D** | **SD** |
| 7. Kushukumisa umtimba kucinisa emandla emamasela ami. | **SA** | **A** | **D** | **SD** |
| 8. Kushukumisa umtimba kungenta ngitive ngatsi kukhona lengikufezile emphilweni. | **SA** | **A** | **D** | **SD** |
| 9. Tindzawo tekushukumisa umtimba tikhashane nami. | **SA** | **A** | **D** | **SD** |
| 10. Kushukumisa umtimba kungenta ngitive ngiphumulile. | **SA** | **A** | **D** | **SD** |
| 11. Kushukumisa umtimba kungihlanganisa nebangani bami kanye nebantfu lengibatsandzako. | **SA** | **A** | **D** | **SD** |
| 12. Ngitiva nginemahloni nekushukumisa umtimba. | **SA** | **A** | **D** | **SD** |
| 13. Kushukumisa umtimba kutangivikela ekutfoleni i-hayi hayi. | **SA** | **A** | **D** | **SD** |
| 14. Kushukumisa umtimba kudulile | **SA** | **A** | **D** | **SD** |
| 15. Kushukumisa umtimba kwenta umtimba wami ucine. | **SA** | **A** | **D** | **SD** |
| 16. Tindzawo tekushukumisa umtimba atinginiki sikhatsi lesingilungelako kutsi ngiyotivocavoca. | **SA** | **A** | **D** | **SD** |
| 17. Emamasela ami aya ngekucina nangichubeka nekushukumisa umtimba. | **SA** | **A** | **D** | **SD** |
| 18. Kushukumisa umtimba kucinisa kusebenta kwemitsambo yami. | **SA** | **A** | **D** | **SD** |
| 19. Kushukumisa umtimba kungenta ngidzinwe | **SA** | **A** | **D** | **SD** |

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| | | | | |
|---|---|---|---|---|
| 20. Sengitivela ngiphilile ngenca yekushukuma. | **SA** | **A** | **D** | **SD** |
| 21. Lengitsandzana naye akakukhutsati Kushukumisa umtimba | **SA** | **A** | **D** | **SD** |
| 22. Kushukumisa umtimba kungengetela emandla. | **SA** | **A** | **D** | **SD** |
| 23. Kushukumisa umtimba kungenta ngikhone kutelula. | **SA** | **A** | **D** | **SD** |
| 24. Kushukumisa umtimba kutsatsa sikhatsi sami lesinyenti lengabe ngisicitsa nemndeni wami. | **SA** | **A** | **D** | **SD** |
| 25. Similo sami sesincono ngenca yekushukumisa umtimba. | **SA** | **A** | **D** | **SD** |
| 26. Kushukumisa umtimba kungenta ngikhone kulala kancono ebusuku. | **SA** | **A** | **D** | **SD** |
| 27. Ngitawuphila sikhatsi lesidze uma ngishukumisa umtimba. | **SA** | **A** | **D** | **SD** |
| 28. Bayangihlekisa bantfu labagcoke tekushukumisa umtimba. | **SA** | **A** | **D** | **SD** |
| 29. Kushukumisa umtimba kwehlisa kukhatsala. | **SA** | **A** | **D** | **SD** |
| 30. Kushukumisa umtimba yindlela lenhle yekutsi ngihlangane nebantfu lebengingabati. | **SA** | **A** | **D** | **SD** |
| 31. Ngiva ngingapheli mandla mangishukumisisa umtimba. | **SA** | **A** | **D** | **SD** |
| 32. Kushukumisa umtimba kushintja indlela lengitibuka ngayo. | **SA** | **A** | **D** | **SD** |
| 33. Umndeni wami awungikhutsati kutsi ngishukumisa umtimba. | **SA** | **A** | **D** | **SD** |
| 34. Kushukumisa umtimba kukhaliphisa ingcondvo yami. | **SA** | **A** | **D** | **SD** |
| 35. Kushukumisa umtimba kungenta ngikhone kwenta yonkhe imisebenti lejwayelekile ngaphandle kwekukhatsala. | **SA** | **A** | **D** | **SD** |
| 36. Kushukumisa umtimba kwenta umsebenti wami ube secophelweni lelisetulu. | **SA** | **A** | **D** | **SD** |
| 37. Kushukumisa umtimba kutsatsa sikhatsi sami lesinengi lengabe ngisisebentisa kwenta imisebenti yasekhaya. | **SA** | **A** | **D** | **SD** |
| 38. Kushukumisa umtimba yindlela lenhle lengitijabulisa ngayo. | **SA** | **A** | **D** | **SD** |
| 39. Kushukumisa umtimba kungenta ngemukeleke kulabanye bantfu. | **SA** | **A** | **D** | **SD** |
| 40. Kushukumisa umtimba ngumsebenti lomatima kabi kimi. | **SA** | **A** | **D** | **SD** |
| 41. Kushukumisa umtimba kwenta umtimba wami wonkhe usebente kahle. | **SA** | **A** | **D** | **SD** |
| 42. Tincane kakhulu tindzawo lengingashukumisa umtimba kuto. | **SA** | **A** | **D** | **SD** |
| 43. Kushukumisa umtimba kwenta umtimba wami ube muhle. | **SA** | **A** | **D** | **SD** |

***Iphela lapho imibuto yetfu. Siyabonga.***

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**APPENDIX F**

**UNIVERSITY OF THE WESTERN CAPE**

Private Bag X 17, Bellville 7535, South Africa

***Tel:* +27(021)959-2542, *Fax:* +27(021)959-2542**

**LIFOMU LESIVUMELWANO**

**Sihloko selucwaningo:** Kushukumisa umtimba kubantfu labadzala labanesifo sekuphakama kwengati eMbabane-Swaziland

Lolucwaningo luchazwe kimi ngelulwini lengiluvako, futsi ngavuma kuphendvula yonkhe imibuto lebutwekimi. Imibuto lebenginayo ngalolucwaningo iphendvulekile. Ngiyacondzakutsi libito lami gekelibhalwe Kulolucwaningo ngekutsi nginalo lilungelo kuphuma Kulolucwaningo ngapandle kwekushotizatfu, noma ngabenini angifuni futsi lokungeke kungikhinyabetena nome nganguyiphi indlela.

| | | | |
|---|---|---|---|
| **Libito lami:** | _____ | **Fakazi:** | _____ |
| **Inombolo yelucwaningo:** | _____ | **Sayina lapha:** | _____ |
| **Sayina lapha/Sitfupha:** | | | |
| **Lusuku:** | _____ | **Lusuku:** | _____ |

Uma ngabe unemibuto ngalo lucwaningo noma ufuna kubika tingcinambalo hlangabetene nato lusentiwa, tsintsanana lobukelo lucwaningo.

**Prof. Julie Phillips**

**University of the Western Cape**

**Telephone: +27(021)959-2542**

**Cell: +2772991549**

**Email: jphillips@uwc.ac.za**

**APPENDIX G**

**UNIVERSITY OF THE WESTERN CAPE**

Private Bag X 17, Bellville 7535, South Africa

***Tel:* +27(021)959-2542, *Fax:* +27(021)959-2542**

**TINCHAZELO NGALOLUCWANINGO**

**Sihloko selucwaningo:** Kushukumisa umtimba kubantfu labadzala labanesifo senhlitiyo eMbabane-Swaziland

**Lungani lolucwaningo?**

Lolu lucwaningo lolwentiwa ngu **SHARON MASONA** longumfundzi weNyuvesi yeWestern Cape, eSikhwahlande. Uyacelwa kutsi ufake umbono wakho kulolucwaningo njengoba ungulomunye walabelashelwa sifo senhlitiyo eMbabane Government Hospital noma ke uyaphatseka ndlelatsite ekunakekeleni bantfu labanesifo senhlitiyo. Ingcikitsi yalolucwaningo kutfola kutsi bantfu labanesifo senhlitiyo labadzala bayashukuma yini nekwekutsi vele bayekhutsatwa yini kutsi bashukumise umtimba. Imininingwane yonkhe letotfolakala kulolucwaningo itosetjentiswa ekusiteni bantfu labanalesifo, tisebenti temphilo nebakhi bemigomo kwekutsi batfole sizatfu sekwenta kushukuma kube yindlela leshiphile yekuncoba nekuvikela sifo senhlitiyo. Itawuphindze yakhe sisekelo seluhlelo lolunebufakazi lobucinile lolutawusita betemphilo bakhe tinhlelo tekuvikela sifo senhlitiyo.

**Ngitawubutwani uma ngivuma kuba yincenye yalolucwaningo?**

Utawudzinga kusayina lifomu lesivumelwano ngaphambi kwekuphendvula imibuto. Njengemuntfu lonesifo, utawudzingeka kutsi uphendvule luhlu lwemibuto lolwehlukaniswe kabili ngesiNgisi noma ngesiSwati, usinikete umcondvo wekutsi ushukuma kangakanani, sikhatsi losisebentisako ushukuma, nebuhle nebulukhuni lohlangabetana nabo nawushukuma. Njengesisebenti setemphilo utawudzingeka kutsi ugcwalise luhla lunye lwemibuto ngesiNgisi ngendlela loluleka ngayo bantfu labanesifo senhlitiyo. Loluhla lwemibuto ludzinga kutsi umake **(**√**)** noma ukipilitele inchazelo lechazisisa imphendvulo yakho. Uma ngabe unesifo senhlitiyo, utawukhulunyiswa nawucedza kubona betemphilo emtfolamphilo kantsi uma ngabe usisisebenti setemphilo utawukhulunyiswa ngesikhatsi lesilungele wena.

**Uma ngivuma kuba yincenye yalolucwaningo, ngitawuvikeleka kanjani?**

Sitakwenta konkhe lokusemandleni kutsi lokuphatselene nawe kungatiwa ngumuntfu.

Kute ube nesiciniseko sekuvikeleka kwakho, angeke udzingeke kutsi ubhale libito lakho ephepheni lweluhla lwemibuto noma ke usitjele lokutakwenta kutsi bantfu babone kutsi ungubani. Uma umbiko noma incwadzi ibhalwa ngalolucwaningo, sitakuvikela ngayo yonkhe indlela.

**Yini tinkinga lengingahlangabetana nato uma ngivuma kuba yincenye yalolucwaningo?**

Kute tingcinamba letatiwako letibangwa kuba yincenye yalolucwaningo.

**Yini inzuzo yalolucwaningo?**

Lolucwaningo alukakhelwa kutsi lusite wena sici sakho, kodvwa lesitakutfola kulo kungasita umcwaningi afundze lokuningi ngesidzingo sekushukuma kute kutfutfuke temphilo kubantfu labanesifo senhlitiyo. Siyetsemba kutsi, ekuhambeni kwemalanga, labanye bantfu bangazuza kulolucwaningo ngekutsi bacondze sidzingo sekutfutfukisa kushukuma kute sincobe sifo senhlitiyo.

**Yini inzuzo lebhekekile kutescience nesive kulolucwaningo, uma ngabe ikhona?**

Lolucwaningo lutawusita ekutfutfukiseni kushukuma kubantfu labanesifo senhlitiyo luphindze lukhutsate tisebenti temphilo kutsi teluleke bantfu labanalesifo nabasetama kusincoba basatfola kwelashwa eMbabane Government Hospital – eSwatini.

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**Kudzingeke ngani kutsi ngibe yincenye yalolucwaningo futsi ngingayekela yini uma sengingasafuni kuchubeka?**

Kuba yincenye yalolucwaningo kusekuvumeni kwakho. Ungakhetsa kungabi yincenye nawufuna. Uma futsi uvuma kuba yincenye, uvumelekile kuyekela uma ungasakhoni kuchubeka. Uma ungafuni kuba yincenye yalolucwaningo noma ungasafuni kuchubeka nalo, angeke uhlawuliswe nome umukwe loko lokuselungelweni lakho.

**Kukhona yini lusito lengitalutfola uma ngiphatseka kabi ngekuba yincenye yalolucwaningo?**

Uma kungenteka uphatseke kabi, utawelulekwa noma wendluliselwe kulabanye bati betemphilo kute bakunakekele noma bakweluleke ngaphandle kwekubhadala imali.

**Ngenta njani uma nginemibuto?**

Lolucwaningo lwentiwa **nguSHARON MASONA** losetikweni lePhysiotherapy eNyuvesi yeWestern Cape.

Uma unemibuto ngalolucwaningo, ungatsintsana naye **SHARON MASONA** ku: University of Western Cape, Cape Town, South Africa, Phone: +27725215829/+26876219223, Email: smasona@yahoo.co.uk.

Noma

**Prof. Julie Philips**

**University of the Western Cape**

**Private Bag X17, Bellville 7535.**

**Telephone number: +2721959 2542**

**E-mail:** jphilips@uwc.ac.za

Uma unemibuto ngalolucwaningo, noma ufuna kwati kabanti ngemalungelo akho njengemhlanganyeli noma ke ufuna kubika tinkinga lohlangabetene nato useyincenye yalolucwaningo, ungatsintsa:

**Head of Department:**

UNIVERSITY of the
WESTERN CAPE

**Dean of the Faculty of Community and Health Sciences:**

**University of the Western Cape**

**Private Bag X17**

**Bellville 7535**

Lolucwaningo lwentiwe ngemvume yeNyuvesi yeWestern Cape's Senate Research Committee kanye ne Ethics Committee.

# APPENDIX H

UNIVERSITY of the
WESTERN CAPE

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

11 March 2013

**To Whom It May Concern**

I hereby certify that the Senate Research Committee of the University of the Western Cape has approved the methodology and ethics of the following research project by:
Ms S Masona (Physiotherapy)

| | |
|---|---|
| Research Project: | Physical activity participation among adults with hypertension in Mbabane, Swaziland. |
| Registration no: | 13/2/30 |

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Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

The Committee must be informed of any serious adverse event and/or termination of the study.

*Ms Patricia Josias*
*Research Ethics Committee Officer*
*University of the Western Cape*

Private Bag X17, Bellville 7535, South Africa
T: +27 21 959 2988/2948 . F: +27 21 959 3170
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A place of quality,
a place to grow, from hope
to action through knowledge

# APPENDIX I

*Telegram:*
*Telex:*
*Telephone: (+268 404 2431)*
*Fax: (+268 404 2092*

*MINISTRY OF HEALTH*
*P.O. BOX 5*
*MBABANE*
*SWAZILAND*

**THE KINGDOM OF SWAZILAND**

**FROM:** The Chairman
Scientific and Ethics Committee
Ministry of Health
P. O Box 5
Mbabane

**TO:** Sharon Masona
Student researcher

**DATE:** 16th May 2013

REF: MH/SSC/FWA 000 15267

**RE: Physical Activity Participation among Adults with Hypertension in Mbabane Swaziland**

The committee thanks you for your submission to the Swaziland Scientific and Ethics Committee on the amendments and an updated protocol.
In view of the importance of the study and the fact that the study is in accordance with ethical and scientific standards, the committee therefore grants you authority to conduct the study. You are requested to adhere to the specific topic and inform the committee through the chairperson of any changes that might occur in the duration of the study which are not in this present arrangement.
The committee requests that you ensure that you submit the findings of this study (Electronic and hard copy) to the Secretariat of the SEC committee; you will need to seek permission from the committee before you can publish the findings of this study.
***The committee further requests that you add the SEC Secretariat as a point of contact if there are any questions about the study on 24047712/24045469.***
The committee wishes you the best and is eagerly awaiting findings of the study to inform proper planning and programming to use for analysis.

Yours Sincerely,

Dr S.V.Mugagula
DEPUTY DIRECTOR OF HEALTH SERVICES
(THE CHAIRMAN)
cc: SEC members

DIRECTOR OF HEALTH SERVICES
MINISTRY OF HEALTH
17 MAY 2013
P O BOX 5 MBABANE
SWAZILAND

UNIVERSITY of the
WESTERN CAPE

**APPENDIX J**

Telephone: 404-21119
Fax 404-6471

Mbabane Government Hospital
P.O Box 6
Mbabane
Swaziland

THE KINGDOM OF SWAZILAND

03th June 2013

MS SHARON MASONA

UNIVERSITY OF WESTERN CAPE,

Dear Sharon,

**RE: YOUR REQUEST /AUTHORIZATION FOR PERMISSION TO CONDUCT A STUDY AT MBABANE GOVERNMENT HOSPITAL TITLED" PHYSICAL ACTIVITY PARTICIPATION AMONG ADULTS WITH HYPERTENSION IN MBABANE SWAZILAND".**

I refer to your letter dated 13/01/2013 requesting to be granted permission to obtain information on the above mentioned subject in our institution .I am pleasec to inform you that the Hospital Management has accepted your request as stated above .I would however aporeciate it, if findings and recommendations could be communicated back to the hospital.

Thank you.

**Yours sincerely,**

**MA DLAMINI**

**SENIOR MEDICAL OFFICER**