TITLE PAGE

MEDICAL DOCTORS PHYSICAL ACTIVITY PATTERNS AND THEIR ADVICE ABOUT CHRONIC DISEASES OF LIFESTYLE RISK REDUCTION IN TANZANIA

BY

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ABSTRACT

Chronic diseases of lifestyle (CDL) are on a raising trend in the world regardless of age, economic class or geographical location of a population. The mortality rate associated with CDL is alarmingly among the highest globally. Tanzania is not exempted from this development.

Literature indicates that physical activity is a health practice that can prevent CDL. It is recommended that medical practitioners should hold the responsibility of counselling patients on physical activity. Some studies outside Africa found an association between doctors' physical activity patterns and their counselling practices on the same. This study therefore sought to establish whether physical inactivity among medical doctors in Tanzania significantly influenced their counselling practices on physical activity. A cross sectional quantitative survey at the Muhimbili National Hospital and Muhimbili Orthopedic Institute was conducted to derive the required information. A self administered structured questionnaire was voluntarily answered by 144 medical doctors. The Statistical Package for Social Sciences (SPSS) version 17 was used for data capturing and analysis. Descriptive statistics were employed to summarize data and was expressed as means, standard deviation, frequencies and percentages. The students't-test was used to compare mean physical activity between different groups. Furthermore students't-test and analysis of variance tests were used to examine association between different variables. Chi-square tests were used to test for associations between categorical variables. Alpha level was set at $p< 0.05$. Most of the participants in this study were sedentary in their leisure time and only active at work. When their quality of physical activity counselling was assessed, the majority of them were found to be poor physical activity counsellors. A significant association was found

between physical activity and age, as well as physical activity and counselling practice ($p<0.05$). Participants mostly informed their patients about the intensity and duration of exercising more than any other idea of physical activity such as types of exercises, issuing of a written prescription and planning for a follow up. Lack of knowledge and experience about details of physical activity were reasons offered for failure to counsel. Participants also reported the inconvenience of physical activity facility's schedules, fatigue and tiredness to be their barriers to physical activity participation. Doctors in Tanzania lacked personal initiative to participate in physical activity and consequently lacked the motivation to counsel. Measures around enhancing this health practice should be enhanced by all stakeholders including medical doctors, physiotherapists and patients. The need for short term and long term training in matters related to physical activity are therefore necessary among the practicing doctors and those undergoing training in medical schools. Physiotherapists who are trained in movement science can offer valuable advice/information to medical doctors to ensure that medical doctors acquire physical activity prescription and counselling knowledge. Collaboration between stakeholders in campaigning against sedentary lifestyles should be enhanced. Further reasons for failure to counsel, hindrances to physical activity participation and modern approaches to counselling should be explored.

KEY WORDS

Chronic diseases of lifestyle

Counselling practices.

Metabolic energy turnover

Physical activity

Physical inactivity

Physicians/Medical doctors

DECLARATION

I hereby declare that**:** ***Physicians physical activity patterns and their advice about Chronic diseases*** of lifestyle ***risk reduction in Tanzania*** is my own work, that it has not been submitted, or part of it, for any degree or examination in any other university, and that all the resources I have used or quoted have been indicated and acknowledged by means of complete references.

Signature: ----------

Karuguti M. Wallace

Witness: ----------

Prof. Julie Phillips

DEDICATION

This thesis is dedicated to my immediate family. Dad, mum, brothers and sister; thank you for your support.

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I sincerely would wish to thank the almighty God for answering my prayer of undertaking this endeavor successfully.

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CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

The importance of physical activity in the prevention and management of CDL is well established. This chapter highlights the prevalence of CDL globally with specific reference to Tanzania. In addition the importance of physical activity in health and the role of medical doctors in physical activity counselling are also highlighted. Furthermore the statement of the problem, the study aim, objectives, and the significance of the study are outlined.

1.2 BACKGROUND

For centuries, communicable diseases were the main causes of death around the world. Life expectancy was often limited by uncontrolled epidemics (Boutayeb & Boutayeb, 2005). After the Second World War, with medical research achievements in terms of vaccination, antibiotics and improvement of life conditions, CDL started causing major problems in industrialized countries. Heart diseases, cancer, diabetes, chronic pulmonary and mental diseases became a real burden for health systems in developed countries (Boutayeb & Boutayeb, 2005). For a while, these diseases were associated with economic development and so-called diseases of the rich. Then, by the dawn of the third millennium, CDL appeared sweeping the entire globe with an increasing trend in developing countries, where the transition imposes more constraints to deal with the double burden of infective and non-infective diseases in a poor environment characterized by ill-health systems (Boutayeb & Boutayeb, 2005).

Today, CDL are by far the leading cause of death in the world, leading to 60 per cent of all deaths (Commonwealth, 2008). The World Health Organization (WHO) has reported that four out of five deaths from CDL, such as diabetes and heart diseases, occur in the developing world. However, the world has not given much attention to CDL despite the fact that the diseases have fatal and debilitating effects (World Health Organization, 2005). CDL are a group of diseases that share similar risk factors as a result of exposure, over many decades, to unhealthy diets, smoking, stress and lack of health benefiting physical activity levels (Lambert & Kolbe-Alexander, 2005). The estimates in the 1990 Global Burden of Disease study suggested that CDL accounted for only 14% of the total burden in sub-Saharan Africa, and for just under a third in adults aged 15–59 years (Unwin et al., 2001). Nonetheless, in absolute terms the estimates also suggested that the probability of death from CDL is higher in sub-Saharan Africa than in established market economies (Unwin et al., 2001). Table 1.1 below shows the evolution of CDL over years including a projection for global burden of disease in 2020.

Table 1.1 Projection for global burden of disease

	Non-Communicable Diseases	Communicable Diseases + Maternal + Perinatal + Nutritional
1990	18.7 (47%)	16.6 (42%)
2000	25.0 (56%)	14.6 (33%)
2020	36.6 (69%)	09.0 (17%)

(Boutayeb & Boutayeb, 2005)

The prevalence of CDL in Tanzania has also received attention in literature. During a 3-year observation that assessed mortality over a single time period in Tanzania, 11 975 deaths were recorded in the three surveillance areas, of which 7629 (64%) were in adults aged 15 years or more, 4088 [54%] of these in men and 3541 [46%] in women. In the adults, 421 (55%) of the deaths were attributed to cerebrovascular disease, 225 (53%) of these in men and 196 (47%) in women (Walker et al., 2000).

Tanzania is also experiencing a rapid increase in the number of diabetic patients with 80% of the newly diagnosed cases having Type 2 diabetes mellitus characterized by classic symptoms of thirst, tiredness, and weight loss (Mosha & Rashidi, 2009). In the 1980's, prevalence of Type 2 diabetes in Tanzania was among the lowest in the world with prevalence rate of 0.8% in cities/towns and 0.9% in rural communities. Over the past decade, there has been a remarkable increase in diabetic cases in both urban and rural communities (prevalence at 4.0% and 1.3%, respectively) (Mosha & Rashidi, 2009). Currently, Tanzania is estimated to have 350,000 people with Type 2 diabetes. Diabetes is now placing an increasing economic burden on the families and on the national budget for health-care, over and above the burden caused by malaria and HIV/AIDS (Mosha & Rashidi, 2009).

A similar study looked at the prevalence of Impaired Glucose Tolerance (IGT) and diabetes mellitus among a migrant Hindu Indian community in Dar es Salaam, Tanzania. The study found out that diabetes was present in 12.9% of men and 12.8% of women aged 35 years and above. The overall age and sex-standardized prevalence of IGT was 16.2% and of diabetes 9.1%. The major risk factors associated with diabetes in both men and women were age, family history of

diabetes, and physical inactivity, and in women body mass index (BMI). Age and BMI contributed to the higher frequency of IGT in women as compared with men while in men, age was the only contributory factor. Despite overweight and obesity being more frequent in women than men, age-standardized prevalence rates of IGT and diabetes were similar between men and women (Ramaiya, Swai, McLarty & Alberti, 1991).

Mosha and Rashidi (2009) established that the level of purposive physical exercises in a study group in Dar es Salaam region was generally low, since only 10.7% (n = 13) of the subjects had high level of exercises as part of self care, while 2.5%, 6.6%, 80.2% (n = 121) had moderately high level, low level and very low levels of practice, respectively. Most participants did physical activity as part of their work or daily chores around the house but not as a separate exercise session. This study found an association between patient's health practices including physical activity and their social economic and demographic characteristics such as levels of education, marital status, occupation and income. However, neither this study nor any other was found to assess the role of medical doctors in enhancing physical activity for management and prevention of CDL.

Physical inactivity has been identified as one of the leading risk factors, in addition to other risk factors such as diet, and the use of tobacco and alcohol, contributing to the occurrence of CDL like cardiovascular diseases, cancers, obesity and type 2 diabetes mellitus (Frantz, 2004). A 2009 global health risks assessment reported that physical inactivity is estimated to cause around 21–25% of breast and colon cancer burden, 27% of diabetes and about 30% of ischemic heart disease burden (World Health Organization, 2009). The report also ranked physical inactivity

fourth among the ten leading risk factors to mortality in the world representing 5.5% (3.2million) deaths globally in 2004.

According to the Morbidity and Mortality Weekly Report (1996), a health benefit is achieved when a light to moderate physical activity for ≥30 minutes for five or more days per week, or vigorous activity for ≥20 minutes for three or more days per week is performed. The role of physical activity in the prevention and control of chronic disease is well documented. Regular physical activity is clearly associated with the control and prevention of coronary heart disease and has also demonstrated reduced risk for hypertension, noninsulin-dependent diabetes mellitus, obesity, anxiety, and depression (Calfas et al., 1996). Individuals who are physically inactive are 1.9 times more likely to develop coronary heart disease than active individuals (Calfas et al., 1996). In addition to decreasing the risk of certain disorders, physical activity is also associated with more general health benefits. In particular, a planned exercise program is an effective means of achieving and maintaining long-term weight loss by increasing energy expenditure and metabolizing body fat while preserving lean mass and raising metabolic rates (Postnote, 2001).

Medical doctors are well positioned to provide physical activity counselling to their patients. They are a respected source of health-related information and can provide continuing preventive counselling feedback and follow-up; and it has been suggested that they may have ethical obligations to prescribe physical activity (Lobelo, Duperly & Frank, 2009). It has also been speculated that patients look up to the medical doctors for health guidance. Nevertheless, health benefiting levels of physical activity remain below the scientifically recommended intensity even among the populations who have frequent encounters with their medical doctors.

In practice, few medical doctors include physical activity in their history taking or provide physical activity recommendations for their patients. When medical doctors are asked about their ability to provide physical activity counselling and exercise prescriptions, they cite insufficient time, lack of reimbursement and inadequate training in physical activity counselling (Connaughton, Weiler & Connaughton, 2001). Training of medical students in the theory and practice of population health is no longer a luxury but a central element of medical education, while competencies in population-based prevention are now considered essential for practicing medical doctors (Barss, Grivna, Maskari & Kershaw, 2008).

A national survey conducted in the UK established that only 31% of UK general practitioners "always" and 36% "occasionally" counselled their patients on physical activity despite their unique patient access and patient credibility (McKenna, Naylor & McDowell, 1998). Several international studies have examined the beliefs of medical practitioners about the importance of physical activity. They found that while this risk factor is considered to be important, most doctors do not discuss this with more than half of their patients. It appears that only when physical activity is relevant to a presenting problem such as obesity and diabetes, are medical practitioners likely to discuss it (Ploeg et al., 2007).

Kallings (2008) evaluated six different methods of promoting physical activity in the heath care setting which were (a) direct advise from a health care professional to a patient; (b) intervention based on theoretical behavioral change models; (c) some form of organized and professionally supervised exercises-usually on an outpatient hospital setup or care facility; (d) counselling by

health care professionals resulting in a written prescription; (e) a formal prescription for lifestyle based physical activity group or recreation centre outside the health care system which enhances collaboration between health care centers and society physical activity organizations and (f) referring the patient into a reorganized system with appropriately qualified staff based on partnership between health and local authorities. This study emphasized written prescriptions based on evidence for knowledge of physical activity and health. However, some studies suggest that medical doctors' personal health habits influence the counselling they give to their patients (Stevenson & Mackenzie, 1992). Medical doctors do not only act as agents of change, advocating healthy behavioral choices among their patients, but also as role models by the example they set in personal health behavior (LeBlanc, Scarinci, LeBlanc & Jones, 1997).

Health professionals who live in a particular way for example, exercising regularly, translate their supporting beliefs, attitudes, and behaviors to their patients. This corresponds with other lifestyle areas, like smoking cessation, where doctors showed consistency between personal behavior and counselling behavior. Patients also like consistency in their doctors; they respond more positively to exercise promotion when they perceive that the doctors "walk their talk". Of 411 patients at a family medicine centre, 70% reported that this would help their willingness to comply with the doctors' recommendation to take more exercise (McKenna et al., 1998).

Frank, Breyan and Elon (2000) reported that patients do care about their medical doctors' health habits. This study further reported that patients who saw a video of a medical doctor giving advice about diet and exercise, reported that the medical doctor was more believable and motivating if he/she disclosed her own personal healthy practices. Furthermore, medical doctors

who have healthy personal habits are more likely to discuss related preventive behaviors with their patients. Splete (2005) reported that medical doctors can enhance their credibility to motivate patients to live healthier lives by spending a few moments sharing their own health habits.

Medical doctors are in a unique professional position and are trusted to be the right source of guidance toward change of behavior pertaining to physical activity participation for control of CDL. They usually have the first encounter with the patient for consultation and the last encounter post referral to other professionals. However, this role may be influenced by their physical inactivity habits. This study will therefore seek to find out whether medical doctors adhere to physical activity practices and if this affects their role of counselling patients about physical activity. Promoting good health among medical doctors is an efficient and powerful way to improve the health of the whole population.

1.3 PROBLEM STATEMENT.

There is inadequate counselling on physical activity for prevention of CDL by medical doctors to the patients they attend to in Tanzania. This could be associated with their personal physical activity habits. Studies in some first world countries have shown that low physical activity levels among medical doctors are directly associated with inadequate counselling on physical activity

1.4 AIM OF THE STUDY

The overall aim of the study was to determine the association between physical activity levels of medical doctors and their physical activity counselling practices. The barriers to physical activity participation by medical doctors were also established.

1.5 OBJECTIVES

1. To determine the levels of physical activity among medical doctors working in selected hospitals in Dar es Salaam region of Tanzania.
2. To establish the barriers to physical activity participation for medical doctors working in selected hospitals in Dar es Salaam region of Tanzania.
3. To identify the physical activity counselling practices of medical doctors working in selected hospitals in Dar es Salaam region of Tanzania.
4. To determine the association between physical activity levels and counselling practices among medical doctors working in selected hospitals in Dar es Salaam region of Tanzania.

1.6 SIGNIFICANCE OF THE STUDY

This study will create awareness of the existence of an association between physical activity levels and counselling practices among medical doctors. It may therefore lead to participatory counselling where by medical doctors discuss with patients pertaining to physical activity on the bases of their experience in the activity and consequently achieving the intended outcome of participation in physical activity and eventually preventing CDL.

1.7 DEFINITION OF KEY TERMS

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).

Medical doctors: Professionally trained individuals whose role is to diagnose illnesses and prescribe and administer treatment for people suffering from injury or disease. Medical doctors examine patients, obtain medical histories, and order, perform, and interpret diagnostic tests. They counsel patients on diet, hygiene, and preventive healthcare (Occupational Outlook Handbook, 2010).

Metabolic energy turnover: These are multiples of the resting metabolic rate and a MET-minute is computed by multiplying the MET score of an activity by the minutes performed (Maddison et al, 2007).

Physical activity: Is defined as any bodily movement produced by skeletal muscles that require energy expenditure (World Health Organization, 2010).

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

Physician: Also known as doctor of medicine, medical doctor, or simply doctor is a practitioner in the ancient profession of medicine. This field is concerned with maintaining or restoring human wellbeing through the study, diagnosis, and treatment of disease or injury. A detailed knowledge in the academic fields like anatomy, physiology, pathology and pharmacology is essential for this practice (Wikipedia, 2010). In the contemporary English language, the term physician is used in two main ways. In the United States and Canada, any one holding a degree of doctor of medicine is referred to as a physician. Outside North America, a physician is a specialist in a specific field of medicine (Wikipedia, 2010). This term is used in this study to refer to a doctor of medicine (medical doctor) who holds a degree of doctor of medicine.

1.8 LIST OF ABREVIATIONS

The following abbreviations have been used in the thesis:

CDL: Chronic diseases of lifestyle

EU: European Union

ERSD: Exercise Related Sudden Death.

MET: Metabolic Energy Turnover.

MNH: Muhimbili National Hospital.

MOI: Muhimbili Orthopedic Institute.

PACE: Physician-based Assessment Counselling on Exercise.

PAEI: Physical Activity Exit Interview.

SPSS: Statistical Packages for Social Sciences.

USA: United States of America.

WFME: World Federation of Medical Education.

WHO: World Health Organization.

1.9 THESIS OUTLINE

In the first chapter the introduction and the background to the study is presented. The aim, the objectives and the significance of the study are highlighted as well.

Chapter two entails a review of literature related to CDL, the role of physical activity in the management of CDL, physical activity and medical doctors and the barriers to physical activity counselling by medical doctors.

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

In chapter four, the results of the study are presented including the demographic profile of the study sample, the physical activity levels and the quality of physical activity counselling content of the sample. The demographic factors influencing the physical activity levels and the quality of physical activity counselling content are also presented. Reasons for failure to counsel patients on physical activity and the barriers to physical activity participation as pointed out by the participants are outlined in chapter four.

Chapter five discusses the results, considers any similarities and differences from previous studies and identifies gaps that future studies can fill while chapter six is a summary, conclusion as well as recommendations that are based on the findings of this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter entails a review of literature concerning CDL and the role of physical activity in the management of these diseases. Furthermore, literature pertaining to medical doctors' personal physical activity patterns/levels and their roles in physical activity counselling practices, are explored. Studies that sought to identify associations between medical doctors' personal physical activity levels and their counselling practices were also explored.

2.2 CHRONIC DISEASES OF LIFESTYLE

Steyn and Damasceno (2006) defines CDL as non-communicable diseases usually emerging in middle age after long exposure to an unhealthy lifestyle involving tobacco use, a lack of regular physical activity, and consumption of diets rich in highly saturated fats, sugars, and salt, typified by "fast foods." This lifestyle results in higher levels of risk factors, such as hypertension, dyslipidemia, diabetes, and obesity that act independently and synergistically. The risk factors are frequently undiagnosed or inadequately managed in health services designed to treat acute conditions. The World Health Organization (WHO) has reported that four out of five deaths from CDL such as diabetes and heart diseases, occur in the developing countries. However, deaths and debilitating effects from chronic diseases in the developing countries have not received as much attention (World Health Organization, 2005). In 2005, WHO reported that CDL accounted for 60% of the 56.5 million deaths each year and almost half of the global burden of disease (Boutayeb & Boutayeb, 2005). The diseases caused an estimated 35 million deaths and

contributed to 60 per cent of deaths globally. About a quarter of these deaths were in low- and middle-income countries of the Commonwealth (Commonwealth, 2008).

The Global Burden of Disease study identified chronic diseases as the main cause of death in industrialized countries in 1990. In 2001, the four leading causes of death related to chronic diseases, killed 1,611,833 people in the US, accounting for two thirds of all the deaths, while, in 2002, they caused 86% of deaths in the European Region (Sassi & Hurst, 2008).

In Denmark, an estimated 40% of the population is living with long-term conditions (Sassi & Hurst, 2008). Alarming trends were observed even in countries traditionally minimally affected by such disease. For instance, Japan saw a 5.3% average annual increase in the prevalence of diabetes in the period 1989-2004 (Sassi & Hurst, 2008). CDL in South Africa account for nearly 40% of adult deaths, and the majority of South Africans have at least one modifiable risk factor for chronic disease. A shortage of recent data on prevalence of CDL in Tanzania was experienced; however a study conducted by Unwin at el. (2001) revealed that Ilala District hospital in Dar es Salaam had 525 new patients with diabetes attending the hospital's weekly diabetic clinic between 1996 and 1998, with over 5000 clinic consultations for diabetes over this period. Also, a population-based survey by Aspray at al., (2000) of 770 adults (aged ≥ 15 years) from an urban district of Dar es Salaam and 928 from a village in rural Kilimanjaro district (Tanzania) revealed that the prevalence of diabetes, impaired fasting glucose (IFG), overweight, obesity, and physical inactivity was higher in the urban area for men and women. The difference between urban and rural prevalence of diabetes was 3.8 (l.l-6.51%) for men and 2.9 (0.8-4.91%) for women.

The growing burden of CDL represents a major challenge to health development (World Health Organization, 2003). The WHO has responded by giving higher priority to CDL prevention, control and surveillance in its programme of work. Surveillance involves ongoing collection of data for better decision-making. It underpins public health action and health promotion activities (World Health Organization, 2003). Under the same conviction, WHO developed the WHO STEPwise approach to surveillance as a tool recommended for non-communicable diseases (CDL). The tool was meant to be used for assessment of risk levels and effectiveness of strategy.

The prevention of disability and death from CDL gets scant attention worldwide. In sub-Saharan Africa it is understandable that governments, donors and research-funding agencies have channeled most resources into infectious diseases. In this region, 5.9% of adults between the ages of 15 and 49 are HIV positive and malaria alone kills a million children under the age of five each year. In richer countries the focus of biomedical research on CDL has been on treatment rather than prevention (Daar et al., 2007). Daar et al. (2007) sought to identify global priorities in establishing programs for CDL control. In this effort therefore 20 grand challenges, grouped under 6 goals were arrived at through a global, structured consensus process (Daar et al., 2007). Among the policies that have been geared towards these challenges, aiming at solving some of the health problems is research. Interdisciplinary research will be needed for example, to explore the interactions of behavior, environment and genetics in framing risks and determining outcomes (Daar et al., 2007).

With physical inactivity being a major risk factor to CDL, the need to expose the hindrances to physical activity participation has increasingly become crucial. Studies of this nature in sub-

Saharan Africa including Tanzania, are insufficient. To reduce this gap the researcher in this study therefore sought to find out whether levels of participation in physical activity by medical doctors influenced their counselling practices to patients on the same.

2.3 The role of physical activity in management of chronic diseases of lifestyle

Warburton, Nicol and Bredin (2006) reported that, while physical inactivity highly contributes to the development of chronic disease and premature death, there is irrefutable evidence of the effectiveness of regular physical activity in the primary and secondary prevention of several chronic diseases such as cardiovascular disease, diabetes, cancer, hypertension, obesity, depression osteoporosis and premature death. Regular physical activity also provides improvements in psychological and cognitive functions, sleep quality and lower back pain symptoms (Ribeiro, Arruda & Calvalho, 2007). Regular physical activity can be a practical means to achieving numerous 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). Indeed, regular physical activity can at least in the relatively short term, decrease body weight and visceral fat accumulation, improve insulin sensitivity, decrease plasma level of triglycerides, increase plasma levels of high-density lipoprotein cholesterol and decrease blood pressure (Gang et al., 2004). Furthermore regular physical activity helps people with chronic diseases to improve their health by decreasing the need for drug treatment, and improving fitness and mood (Fahey, Insel & Roth, 2001). Physical activity leads to a number of favorable alterations in systemic function, including reduction in blood pressure, adiposity, improvement of endothelial function and insulin sensitivity. These effects of exercise combine to lower the incidence of stroke, diabetes mellitus and coronary heart disease. Early clinical

findings already demonstrated reduced morbidity and mortality in physically active individuals compared with their sedentary counterparts (Yung et al., 2009).

There has been recent evidence on physical activity/exercise and reduction of some of the major CDL's incidence. The strongest evidence exists for colon cancer, breast cancer, and cardiovascular diseases. The maximal magnitudes of the risk reduction reported were: 75% for breast cancer, 49% for cardiovascular and heart diseases, 35% for diabetes, 22% for colorectal cancer. Increased physical activity also prevented the weight gain associated with ageing at least 2-times greater in individuals who were more active compared with those who were inactive (Kruk, 2007). Despite a strong link between physical inactivity and CDL risk, a growing body of evidence originating from representative samples found that a low percentage of adults identified a lack of physical activity as a risk factor for the diseases. This view is supported by a low knowledge of the influence of lifestyle on the health problems even among well educated young people of the world, especially in some countries of Eastern Europe, Asia, Africa and Latin America (Kruk, 2007). This indicates a general lack of knowledge among the public that increase of the disease incident rates is due in part to physical inactivity (Kruk, 2007).

It is with disregard to the level of education or civilization that this study is advocating for enhancement of the importance of physical activity among the populations of Tanzania.

2.4 Physical activity and Medical doctors

Given the significant impact that Physical activity can have in reducing the prevalence of CDL, disability and mortality, examination of the counselling practices of medical doctors regarding Physical activity is crucial (Abramson, Stein, Scchaufele, Frates & Rogan, 2000). Further efforts are necessary to increase the effectiveness of physician advice for patients at-risk of CDL

specifically regarding increasing Physical activity (Friedman, Brownson, Peterson & Wilkerson, 1994). LeBlanc et al. (1997) conducted a study on high-risk behaviors for cardiovascular disease among medical doctors in the United States and reported that 54% of the respondents engaged in Physical activity, whereas 27% did not engage in this practice. Although the frequency of exercising among doctors was considerably higher than that of the general population, it was still below the level recommended by experts for a health benefit. The authors of this study suggested that efforts should be made in promoting Physical activity among medical doctors and future investigations should focus on the identification of the hindrances that prevent them from engaging in regular exercise and provide suitable programs and recommendations tailored towards this particular population.

In order to increase the low proportion of adults who comply with current physical activity recommendations, it is recommended that physicians provide physical activity counselling to their patients (Frank, Tong, Lobelo, Carrera & Duperly, 2008). Medical doctors hold a unique position in influencing patients regarding health promotion and disease prevention. Exercise is considered an important and cost effective component in health promotion and is recommended by many experts (Willford, Barfield, Lazenby & Oslon, 1992). Their abilities to motivate patients to adopt healthy habits can be enhanced by conveying their own healthy habits (Frank, Breyan & Elon, 2000). However, medical doctors may fail to develop a physical activity prescription for a patient or feel uncomfortable to develop it or even fail to participate in physical activity due to lack of professional training in that area (Willford, Barfield, Lazenby & Oslon, 1992).

Lewis, Clancy, Leake and Schwartz (1991) went ahead to suggest that it might be advantageous to encourage positive health habits and counselling skills in the first year of medical school. In Africa, at Stellenbosch University, the pre-clinical curriculum has been adapted to significantly reduce the volume of basic sciences; to place increased emphasis on the clinical relevance of science subjects; and to integrate large portions of the content of pre-clinical subjects into clinical components of the course. At the same time, changes to clinical components of the course aim to emphasize health promotion and prevention, use a problem-solving approach, and improve managerial and social skills necessary to function as an independent primary care practitioner (Lehmann, Andrews & Sanders, 2000).

2.5 BARRIERS TO PHYSICAL ACTIVITY COUNSELLING BY MEDICAL DOCTORS

Various barriers to physical activity counselling by medical doctors have been cited in literature. Medical doctors report having limited medical school and residency training education about the benefits of physical activity, inadequate knowledge of writing an exercise prescription or referral and poor reimbursement as barriers to counselling regarding physical activity (Willford et al., 1992).

2.5.1 Education

The improved health of all people is the main goal of medical education. This is also the overall mission of the World Federation for Medical Education (WFME). In keeping with its constitution, as the international body representing all medical teachers and medical teaching institutions, WFME undertakes to promote the highest scientific and ethical standards in medical

education, initiating new learning methods, new instructional tools, and innovative management of medical education International (International Association of Medical Colleges, 2003). Traditional goals of universities have been defined as "methodical discovery and teaching of truths about serious and important things". The World Health organization suggests a coordinated series of activities intended to facilitate change in medical education to meet the current and future requirements of the society (Boelen, Bandaranayake, Bouhuijs, Page & Rothman, 1992). New exigencies in health care suggest that reforms in medical education should also be seen in the context of a need for inter-professional collaboration and for continuing education (Boelen et al., 1992). Steinert (2005) raised this concern once more and stated that inter-professional education for collaborative patient-centered practice was a key mechanism to address health care needs and priorities. She further suggested that faculty development can play a unique role in promoting inter-professional education by addressing some of the barriers to teaching and learning that exist at both the individual and the organizational level, and by providing individuals with the knowledge and skills needed to design and facilitate inter-professional education.

A study conducted in the United Arab Emirates aimed at evaluating the impact of a lifestyle curriculum that was developed and integrated into the first year medical school curriculum. The curriculum involved an introduction to determinants of health in relation to lifestyles such as smoking, nutrition, exercise, and food hygiene and traffic safety. Following this intervention, detailed evaluation revealed strong agreement among students that knowledge had improved on: counselling of patients and families (97%), promoting healthy lifestyles (100%); interviewing (88%); history taking (84%); using research for medical practice (89%); and importance of

prevention (96%). Those that were stimulated to think in new ways about health were (86%). Improved personal diet was reported by 60% and exercise by 55% while 36% of non-users started wearing a safety belt in front and 20% in the rear (Barss, Grivna, Al-Maskari & Kershaw, 2008).

In their study, Kennedy and Meeuwisse (2003) sought to identify reasons for failure to counsel on physical activity by physicians. Among the reasons that were highlighted was low confidence in the knowledge that the doctors possessed pertaining to physical activity counselling. Among the doctors, 42.4% felt "moderately knowledgeable" but only 9.7% felt "very" or "extremely knowledgeable. The rest were either "not confident" or "slightly confident". Although basic counselling skills are already part of some health disciplines (e.g., nursing and dietetics), these skills could also be included in residency training or continuing education for medical doctors as this will provide them with the background and confidence necessary to engage in counselling on lifestyle behaviors such as physical activity (Van Wormer, Pronk & Kroeninger, 2009). Kennedy and Meeuwisse (2003) suggested that future research is required to determine the type of exercise education, counselling tools, or health system changes that could assist family physicians to do more exercise counselling. Since lifestyle is a major determinant of health, medical schools should consider development of an appropriate curriculum to address their local and national health priorities (Barss et al., 2008). Providing our future medical doctors with the knowledge and skills to ask about physical activity, assess past and current activity patterns, and advise patients regarding implementation or maintenance of physical activity patterns, will be some of the most significant changes we can make in medical education this decade (Garry, Diamond & Whitley, 2002).

2.5.2 Time

Among other barriers, time has been pointed out as a factor that prevents medical doctors from counselling on physical activity. In Canada, a total of 65% of the medical doctors considered time as either an "important, very important or extremely important" factor to counselling hence implying the extent of time as a hindrance to the practice (Kennedy & Meeuwisse, 2003). In the USA, 56% of internal medicine resident physicians from six US training institutions reported that lack of time was a barrier to counselling on physical activity (Lobelo et al., 2009). Furthermore, Leinonen et al. (2007) suggested that due to their strictly scheduled practices, physicians may not have enough time to focus on effective physical activity counselling and therefore may not be the most appropriate group to provide exercise counselling. While some scholars have suggested that those physicians who lack time to counsel on physical activity, should delegate the duty to some other trained professionals to do it (American Heart Association, 2010). Tully, Cupples and Young (2004) proposed that by the use of motivational interviewing techniques, physicians should be in a position to assess patients desire to change their lifestyle and begin an exercise program. This may avoid wasting the physicians' effort and time on those who are not serious about investing their effort and time in exercise (Tully et al., 2004).

2.5.3 Area of specialty

Concern has been expressed regarding the suitability of medical doctors to prescribe physical activity given their limited training in this area (Tully et al., 2004). Leinonen et al, (2006) highlighted that in several other studies physical activity counselling has been given by medical doctors and only in few studies by nurses, physiotherapists or exercise specialists. Some medical defence organizations advise that, if the physician is unsure of his/her own level of knowledge,

rather than prescribing exercise, recommending it is more appropriate (Tully et al., 2004). Others recommend that physicians could refer patients to a physiotherapist or a nurse specialized in physical activity counselling when a need for physical activity promotion is observed (Leinonen et al., 2007). In the context of specialty and the necessary knowledge for physical activity counselling, Leinonen et al. (2007) recommend that nurses would need additional education for the task as compared to physiotherapists.

2.5.4 Medical doctors participation in physical activity

Techniques for prevention approaches in health were conceived long time ago and in the same way curative medicine has become less insistent in the management of CDL (Frank & Kunovich-Frieze, 1995). Literature indicates that although medical doctors understand the benefits of physical activity (Walsh, Swangard, Davis & McPhee, 1999), their own levels of physical activity remain below the health benefiting levels (Frank et al., 2008). Research has therefore sought to identify their perceived barriers to participation in physical activity. In a study on medical doctors' fitness program and their enhancement as exercise Role Models for Patients" Rogers et al. (2005) identified four primary barriers to physical activity among the physicians of Atlanta, Georgia. These were work schedules, personal responsibilities, personal motivation, and accessibility of physical activity facilities and opportunities (Rogers et al., 2005). The physicians also revealed that the three major factors that would influence their participation in physical activity were health/personal reasons, personal goals, and social interaction. The resident physicians understood the health implications of exercise intellectually, but this knowledge was not sufficient to motivate regular physical activity (Rogers et al., 2005).

Studies have shown that physicians belief that physical activity is important for prevention of CDL (Van der Ploeg et al., 2007). However counselling levels on physical activity still remain low. Based on this fact, scholars have sought to identify whether a relationship exists between personal health lifestyles such as physical activity and their counselling practices on the same. In a study on physical activity habits and the counselling practices" Lobelo et al. (2009) indicated that there is compelling evidence that the health of medical doctors matters and that doctors' own physical activity practices influence their clinical attitudes towards physical activity. On a more general perspective, Duperly et al. (2009) looked at more than one personal lifestyle behavior such as physical activity and diet among Colombian medical students in relation to their counselling practice. The study concluded that lifestyle habits can be transferred into professional practice; in this case, preventive counselling where physicians' discussion of personal healthy eating or active lifestyle practices makes the message more credible, coherent, and motivating for patients.

The search of literature lacked information on hindrances to physical activity counselling by medical doctors in Tanzania. Now that some literature also outside Africa has shown that an association exists between medical doctors physical activity behaviors and their counselling practices (Frank et al., 2008; Foster et al., 2002; & Frank et al., 2000) then the need to explore their physical activity levels is becoming increasingly important hence the motivation to conduct the current study.

2.6 SUMMARY

The reviewed literature in this chapter has shown an alarming trend of the raise in incidence of CDL both in developed world and the developing world. The chapter also entails literature with

scientific evidence that physical activity is a preventive measure against CDL. Other benefits of physical activity that have been highlighted include improvement of cognitive and psychological functions, improvement if insulin sensitivity reduction of weight and among others, decreasing the need for drug therapy for those who are already affected.

Literature also reveals that medical doctors have a role in influencing the general population to participate in physical activity through counselling. Furthermore their role as role models in this endeavor was emphasized, hence depicting physical inactivity among medical doctors as a risk factor to their role in counselling. However, despite the fact that the literature revealing this association was not much, it was also not available in Africa. This study therefore sought to add to the body of knowledge about whether Tanzania's medical doctors' personal physical activity patterns influence their counselling practices on physical activity.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

In this chapter the methods used in the study are described. A description of the research setting, the research design and sampling method is given. Furthermore the data collection method, the research instrument used to capture the data and the statistical analysis used, are described. Finally the ethical considerations are outlined.

3.2 RESEARCH SETTING

This study was conducted in the Dar es Salaam region of the United Republic of Tanzania. The United Republic of Tanzania is a country in Central East Africa bordered by Kenya and Uganda to the North, Rwanda, Burundi and the Democratic Republic of Congo to the West, and Zambia, Malawi and Mozambique to the South. The country's Eastern borders lie on the Indian Ocean (Wikipedia, 2010). Tanzania is divided into 26 regions, twenty-one on the mainland and five in Zanzibar, the island (Wikipedia, 2010).

Dar es Salaam is an administrative region and the largest commercial city in the country. The region is administratively formed by three districts namely Ilala, Kinondoni and Temeke. Each of these districts is served by a public district hospital meant to cater for patients living in the respective geographical districts. In the Dar es Salaam region, there are two national and referral hospitals. Muhimbili National Hospital (MNH) is the largest hospital in the country with a bed capacity of 1400 patients and Muhimbili Orthopedic Institutes (MOI) is the only orthopedic and

neurosurgery institution in the country with a bed capacity of 150 patients. The two hospitals cater for patients referred from the three district hospitals and from other regions in the country being rural or urban. Dar es Salaam region is estimated to have a total of 448 Physicians working both in private and public hospitals.

3.3 RESEARCH DESIGN

A quantitative cross sectional survey was conducted whereby a self administered structured questionnaire was answered by the participants. This design was appropriate for the study since it could examine the response of different groups e.g. interns, registrars and specialists at one point in time. The design enabled the researcher to collect data within the limited time frame available.

3.4 STUDY POPULATION AND SAMPLING

The study population was the medical doctors in the Dar es Salaam region working in both public and private institutions. Muhimbili National Hospital and Muhimbili Orthopedic institute have 283 medical doctors i.e. 233 and 50 respectively which is the largest number, i.e. 74.3% compared to other public and private hospitals in the region which are estimated to have 115 medical doctors which is only 25.7 %. Therefore these two hospitals were conveniently selected as they are also easily accessible to the researcher. In addition, all the medical doctors' professional categories are available and the selected sample will be representative of the region because they cater for patients referred from all around the region. The 233 medical doctors in MNH comprise of 48 interns, 65 registrars and 120 specialists/consultants. This forms a ratio of

2:3:5 while the 50 medical doctors in Muhimbili Orthopedic Institute constitute of 15 interns, 25 registrars and 10 specialists/consultants, forming a ratio of 3:5:2. From this sample, the Yamane formulae was used to derive the sample size **(n = N÷1+N (e)** ^{2} .Where by n= Sample size, N= Sample and e =error margin (Glenn & Israel, 2009). Accordingly 147 doctors was the required sample size from MNH and 44 from MOI. The sample sizes for each institution was finally distributed as per the ratios of the medical doctors' professional categories to end up with 29 interns, 44 registrars and 74 Specialists/consultants in MNH and 13 interns, 22 registrars and 9 specialist/consultants. Participants were randomly selected from a list obtained from the Human Recourse department at each institution.

All male and female medical doctors working on a full time bases at Muhimbili National Hospital and Muhimbili Orthopedic institute, with a minimum qualification of a first degree in medicine, practicing as interns including those practicing with the highest rank of consultancy and attending to patients as their main duty objective, were included. Non-medical doctors and those doctors who have other duties e.g. administrative that restrict them from attending to patients on daily basis, were excluded.

3.5 DATA COLLECTION

Data regarding physical activity of medical doctors and their counselling practices were collected with a self administered questionnaire.

3.5.1 Self-administered questionnaire

The questionnaire (Appendix A) consists of four sections. The first section requested for demographic information such as gender, marital status, age and professional category i.e. interns, registrars or specialists.

The second section was adopted from the WHO Steps framework instrument for non-communicable diseases risk factors (World Health Organization, 2003). Only the section related to physical activity was used. Participants were requested to report on the number of days and the number of hours/minutes that they were involved in physical activity at work and leisure time. Furthermore they were asked to report on sedentary behavior. When calculating a person's overall energy expenditure using the stepwise instruments data, 4 Metabolic Equivalent Tasks (METs) was assigned to moderate activities of at least 10 minutes continuously, and 8 METs to vigorous activities of at least 10 minutes continuously.

The third section consists of the Exercise Barrier Scale. This scale consists of 14 Likert type items with responses ranging from strongly agree to strongly disagree (Sechrist, Walker & Pende r, 1985). This scale determined perceptions of participants concerning barriers to participating in physical activity/exercise. The scale has a four response forced likert scale format from 4 (strongly agree) to 1 (strongly disagree) and with the scores ranging from 14 to 56 where by the higher the score the greater the perception to exercise barriers.

The fourth section measured the content of physical activity counselling by participants. The physical activity Exit Interview (PAEI) instrument consists of 12 yes/no questions covering the

main content that health care providers may discuss pertaining to physical activity (Sciamanna, Goldstein, Marcus, Lawrence & Pinto, 2004). Scores can range from 0 to 12 where by a score of 0 to 4 reflects a poor quality of physical activity counselling content, while 5 to 8 was a moderate quality content and 9 to 12 was a high quality content of physical activity counselling.

The questionnaire, the consent form (Appendix B) and the information sheet (Appendix C) were translated by a professional translator, from English to Kiswahili (Appendices D, E, F) the official language used in Tanzania. They were then back-translated into English by an independent translator in order to establish that the Kiswahili version carries the intended meaning as the English version.

3.5.2 Reliability and validity of self-administered questionnaire

Reliability refers to the consistency of a measure. A test is considered reliable if the same results are obtained repeatedly (Cherry, 2009). The WHO STEPS surveillance instrument has been reliably used in studies such as the one done in Pakistan (Nishtar, Bile, Ahmed, Amjad & Iqbal, 2005) and other countries of South East Asia Region (SEAR). Test-retest reliability for the Exercise Barriers Scale was accomplished with a sample of 66 healthy adults at a two-week interval and the tools correlation coefficient score was 0.77 (Sechrist et al., 1985). PAEI was found to have been reliable in determining the content of physical activity counselling by medical doctors as was reported by Sciamanna et al. (2004) in their validity and reliability trials for the instrument.

Validity is the extent to which a test measures what it claims to measure. It is vital for a test to be valid in order for the results to be accurately applied and interpreted (Van Wagner, 2006). The WHO STEPS instrument was structured to suit different settings. It has already proven valid in NCDs risk factor surveillances across WHO member states such as the South East Asia countries (World Health Organization, 2003) as well as in South Africa as shown by (Frantz, 2004). The Exercise Barriers Scales instrument was tested for internal consistency and validity of its constructs with a sample of 650 individuals, primarily from Northern Illinois. The 14-item Scale had a standardized alpha of 0.866 (Sechrist et al., 1985). The physical activity Exit interview was tested for validity as a scale for establishing the content of physical activity counselling. This was done among 43 Medical doctors and their test supports the validity of the PAEI as a measure of the content of physical activity counselling practice in a hospital setting (Sciamanna et al., 2004).

3.5.3 Pilot study

A pilot study is a small scale study version, or a trial run, done in preparation for the major study. A pilot study can also be used for pre-testing or 'trying out' of a particular research instrument (Teijlingen & Hundley, 2001). Fifteen medical doctors who satisfied the inclusion criteria were used in a pilot study after agreeing to it through a written consent. The aim of the pilot study was to check for the length of time needed to complete the questionnaire, the clarity and understanding of the items in the four sections. This was followed by a discussion between the researcher and the participants. It was suggested that participants could select a possible reason as to why he/she does not do counselling on physical activity instead of being an open question. It was furthermore suggested the options that would suit the question to be (a) Not enough time

(b) Do not believe that it offers any benefit (c) Not enough knowledge or experience and (d) Not my area of specialty.

3.6 PROCEDURE

Approval for the study by the University of the Western Cape Senate, Research Grant and Study Leave Committee was sought and acquired (Appendix G). Permission by the Ministry of Health-Tanzania and the respective hospitals administration was sought (Appendix H, I & J) and granted too (Appendix K, L & M). The researcher attended the daily morning clinical meetings at the two institutions. At the meeting, the aim and the nature of study were made clear. The questionnaires and consent forms were then distributed to those doctors willing to participate in the study. Arrangements were made regarding the collection of the completed questionnaires at the initial meeting. A research assistant for each institution who assisted in follow up of the completed questionnaires was introduced to the participants.

3.7 DATA ANALYSIS

The Statistical Package for Social Sciences (SPSS) version 17 was used for data capturing and analysis. Descriptive statistics were employed to summarize data and was expressed as means, standard deviations, frequencies and percentages. A continuous indicator of Metabolic Equivalent Task (MET) was used to estimate the sample's mean physical activity levels. The total time spent in physical activity in a typical week, the number of days as well as the intensity were taken into account. The four response part of the exercise barriers section was further dichotomized into agree and disagree responses and presented in percentages.

The students't-test was used to compare mean physical activity between different groups. Furthermore students't-test and analysis of variance tests were used to examine the association

between different variables such as barriers to physical activity and physical activity counselling content. Chi-square tests were used to test for associations between categorical variables. Alpha level was set at $p < 0.05$.

3.8 ETHICAL CONSIDERATIONS

Ethical clearance was sought and acquired from the University of the Western Cape Senate Higher Degree and Research Grant and Study Leave committees. The researcher also sought permission to conduct the study from the Ministry of Health in Tanzania and from the authorities of the respective hospitals where the participants are employees. An information sheet explaining the aim and rationale of the study was made available to the participants. Matters concerning respect, privacy, confidentiality and anonymity were made clear and observed. Agreement to complete the questionnaire was done through a written consent form which was signed by the participants. Participants were informed of their freedom to withdraw from the study at any time and without prejudice. The information collected will be made available to all the relevant stake holders.

3.9 SUMMARY

In this chapter, the methodology used to conduct this study was presented. This included the setting, study design and its suitability to the study, population and sampling, data gathering instrument, the procedures and the ethical issues that were considered. The results will be outlined in the next chapter.

CHAPTER FOUR

RESULTS

4.1 INTRODUCTION

This chapter describes the results of the statistical analysis that attempted to answer the research objectives stated in chapter one.

4.2 DESCRIPTION OF STUDY SAMPLE

A total of 191 medical doctors at MNH and MOI were approached to participate in the study. A total of 144 medical doctors voluntarily participated in the study resulting in a response rate of 75.4%. As illustrated in table 4.1 the majority of the participants (66.7%) was male and married (73.6%). The minimum age was 25 years while the maximum was 61 with a mean age of 36.44 (SD=8.56).

Table 4.1 Socio-demographic details of the participants (n=144)

Variables	Frequency	Percentages
Gender		
Male	96	66.7
Female	48	33.3
Ranks of doctors		
Intern	39	27.1
Registrars	48	33.3
Specialists	57	39.6
Marital status		
Married	106	73.6
Single	37	25.7
Divorced	1	0.7

Mean age = 36.44 (SD = 8.56)

4.3 PHYSICAL ACTIVITY LEVELS OF STUDY SAMPLE

The study sample was categorized as sedentary, moderately physically active or highly physically active. In this regard, their frequency of participation in days, intensity in minutes and the estimated caloric consumption values for different levels of activity were considered in order to derive individual physical activity levels in MET-minutes/week. Participants were considered sedentary if they accumulated 0-599 MET-minutes/week, moderately physically active if they accumulated 600-2999 MET-minutes/week and highly physically active if they accumulated above 3000 MET-minutes/week. The mean MET-minutes/week was 3613.9 (SD=4946). More than a third (35%) of the study sample was categorized as sedentary as illustrated in figure 4.1.

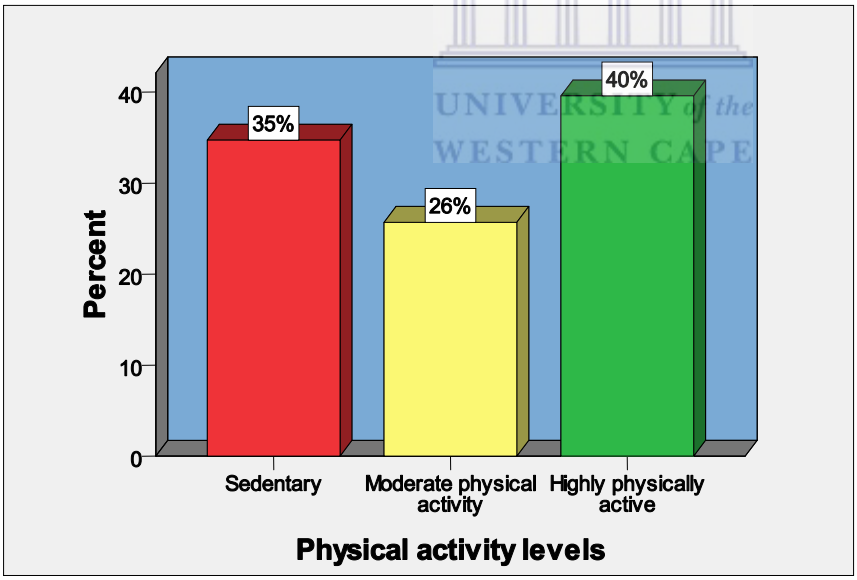


Figure 4.1 Physical activity level attained by medical doctors (n=144)

Physical activity patterns in relation to work, transportation and recreational activities were also assessed. The highest mean MET-minutes/week among the participants was accumulated at work

(2165.33) while the lowest (330) was accumulated in the recreation activities of the participants as illustrated in table 4.2.

Table 4.2 Mean MET-minutes/week in various domains

DOMAINS	Mean MET
physical activity at work	2165.3333
Transport Physical activity	788.5625
Physical activity in recreational	330

4.4 FACTORS INFLUENCING LEVELS OF PHYSICAL ACTIVITY

4.4.1 Age

An association between age and levels of physical activity was found ($p<0.05$). The percentage count of participants in the sedentary category was found to be higher in the older age groups of >50 years. For the younger age groups (<45), more of them were found in the highly physically active category and less of them in the sedentary category as illustrated in table 4.3.

4.4.2 Gender

A statistical association ($p<0.05$) between gender and physical activity levels was found. A higher percentage of males (36.5%) than females (31.3%) were found to be sedentary while most of the female participants (41.7%) was in the highly physically active category compared to the male (38.5%) as illustrated in table 4.3.

4.4.3 Ranks of doctors

A higher percentage of interns (51.3%) were considered highly physically active when compared to the registrars (33.3%) and specialists (36.8%) as illustrated in table 4.3. These differences were however not statistically significant ($p >0.05$).

4.4.4 Marital status

There were more highly physically active single participants (40.5%) than the married participants (38.7%) as illustrated in table 4.3. No statistically significant difference was found between marital status and physical activity ($p>0.05$).

Table 4.3 Factor influencing participation in physical activity (n=144)

Variables	Sedentary (%)	Moderate physically active (%)	Highly physically Active (%)
Age groups *			
25-29	28.9	26.3	44.7
30-34	36.4	18.2	45.5
35-39	42.3	23.1	34.6
40-44	21.7	43.5	34.8
45-49	45.5	18.2	36.4
50-54	50	16.7	33.3
55-59	40	20	40
60-64	50	50	0
Gender *			
Male	36.5	25	38.5
Female	31.3	27.1	41.7
Ranks of doctors			
Interns	33.3	15.4	51.3
Registrars	27.1	39.6	33.3
Specialists	42.1	21.1	36.8
Marital status			
Married	34.9	26.4	38.7
Single	35.1	24.3	40.5

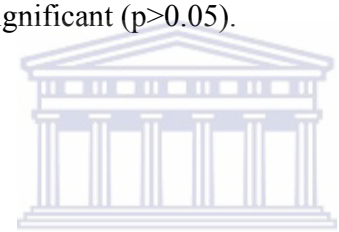
***Significant at $p < 0.05$**

4.5 FACTORS INFLUENCING PHYSICAL ACTIVITY LEVELS IN DIFFERENT DOMAINS

The mean MET-minutes/week in the three domains of work, transport and recreation were assessed in relation to gender and the ranks of doctors.

4.5.1 Gender

The female participants accumulated a higher mean MET-minutes/week than the male participants both at work (2399.17) and in transport (1086.67) as illustrated in table 4.4. These differences were not statistically significant ($p>0.05$).



4.5.2 Ranks of doctors

The mean MET/week was higher among the interns in all the three domains of work (2569.23), transport (1329.33) and recreation (531.8) compared to the registrars and the specialists as shown in table 4.4. These differences were not statistically significant ($p>0.05$).

4.5.3 Marital status

The single participants had accumulated a higher mean MET-minutes/week at work (2154.27), in transport (1262.27) and in recreation (387.84) compared to the married participants as shown in table 4.4. There was only one divorced participant and was not considered for mean MET calculation. A statistically significant difference between marital status and mean MET minute/week was found ($p<0.05$).

Table 4.4 Mean MET minutes/week for gender and ranks of doctors (n=144)

Variables	Work	Transport	Recreation
Gender			
Male	2048.42	639.51	332.50
Female	2399.17	1086.67	325
Ranks of doctors			
Interns	2569.23	1329.33	531.8
Registrars	1909.58	594.58	145.62
Specialists	2104.35	581.91	212.29
Marital Status*			
Married	2099.06	608.00	298.77
Single	2154.27	1262.27	387.84

*Significant at p< 0.05

4.6 BARRIERS TO PHYSICAL ACTIVITY PARTICIPATION

This study also explored the barriers that were likely to have been hindering the participants from participating in physical activity. The participants were requested to indicate the degree to which they perceived each of the 14 ideas related to exercise as being a barrier to participation in physical activity. Table 4.5 outlines the perceived barriers to physical activity participation of the study sample. For the majority of the 14 listed barriers, participants did not perceive these as actual barriers, e.g. *it costs too much money for them to exercise (93%) that people in exercise clothes look funny (93%) and that exercise takes too much time from their family relationships (*90%). However there were some barriers that were substantially perceived as actual barriers by

the participants such as *Exercise facilities do not have convenient schedules for them* (35%) *that they were fatigued by exercise (25%) and that exercise tired them (25%).*

Table 4.5 Perceived barriers to physical activity participation (n=144)

Barriers to physical activity participation	Agree %	Disagree %
Exercising takes too much of my time.	21	79
Exercise tires me.	25	75
Places for me to exercise are too far away.	18	82
I am too embarrassed to exercise.	11	89
It costs too much money to exercise.	7	93
Exercise facilities do not have convenient schedules for me.	35	65
I am fatigued by exercise.	25	75
My spouse does not encourage exercising.	13	87
Exercise takes too much time from family relationships	10	90
I think people in exercise clothes look funny.	7	93
My family members do not encourage me to exercise.	13	87
Exercise takes too much time from my family responsibilities.	15	85
Exercise is hard work for me.	11	89

The study explored how the participants perceived the 14 listed barriers as per the ranks of doctors. Table 4.6 shows that the majority of the interns did not perceive how people in exercise cloths look (96.4%), time taken by exercise away from the family (100%) lack of encouragement from spouse (96.4%) or family members (96.4%) or time taken away from family relationships (96.4%) as barriers to physical activity participation. On their part, the majority of the registrars

did not perceive the cost of exercising (85.4%), time taken from family relationships (79.2%) and how people in exercise cloths look (89.6%) to be actual barriers to physical activity participation. For the majority of the specialists, being embarrassed by exercise (96.5%), the cost of exercising, exercise being too hard work for them (94.7%) and how people in exercise cloths look (94.7%) were not perceived as actual barriers to physical activity participation. Table 4.6 also illustrates some of the barriers that a substantial percentage of interns, registrars and specialists perceived as actual barriers. These were such as exercise facilities schedules being inconvenient (36%), being tired by exercise (28.2%) and being fatigued by exercise (20%) as perceived by interns. The same barriers were perceived as actual barriers by the registrars at (37.6%), (37.5%) and (39.6%) respectively while the specialists perceived inconvenience of exercise facilities schedules (31.6%) being fatigued by exercise (25.8%) and exercise taking too much of their time to be actual barriers to exercise participation.

Table 4.6 Barrier to physical activity as perceived by specific ranks of medical doctors (n=144)

	Agree			Disagree		
List of ideas	**Interns (%)**	**Registrars (%)**	**Specialist (%)**	**Interns (%)**	**Registrars (%)**	**Specialist (%)**
Exercising takes too much of my time.	5	33	22.8	95	67	77.2
Exercise tires me.	28.2	37.5	12.3	71.8	62.5	87.8
Places for me to exercise are too far away.	15	20.9	17.5	85	79.1	82.5
I am too embarrassed to exercise.	7.7	22.9	3.5	92.3	77.1	**96.5**
It costs too much money to exercise.	3	14.6	3.5	97	**85.4**	**96.5**
Exercise facilities do not have convenient schedules for me.	36	37.6	31.6	64	62.5	68.4
I am fatigued by exercise.	20	39.6	25.8	80	70.4	84.2
My spouse (or significant other) does not encourage exercising.	2.6	22.9	10.6	**96.4**	77.1	89.4
Exercise takes too much time from family relationships	0	20.8	7.1	**100**	**79.2**	92.9
I think people in exercise clothes look funny.	2.6	10.4	5.3	**96.4**	**89.6**	**94.7**
My family members do not encourage me to exercise.	2.6	25	7	**96.4**	75	93
Exercise takes too much time from my family responsibilities.	2.6	31.3	10.5	**96.4**	68.8	89.5
Exercise is hard work for me.	5	22.9	5.3	95	77.1	**94.7**
There are too few places for me to exercise.	13	27.1	15.8	87	72.7	84.2

Key; Bold - Strongly perceived not as barriers
Underlined - Substantially perceived as barriers

4.7 PHYSICAL ACTIVITY COUNSELLING PRACTICES

The quality of the counselling content of the participants was determined by the number of ideas that the study sample indicated to have been including in their discussion with the patient pertaining to physical activity. The samples were therefore categorized to have been poor, moderate or good counsellors in this regard. According to the criteria 62%, 21% and 17% of them were therefore categorized to have been poor, moderate and good physical activity counsellors respectively as illustrated in figure 4.2.

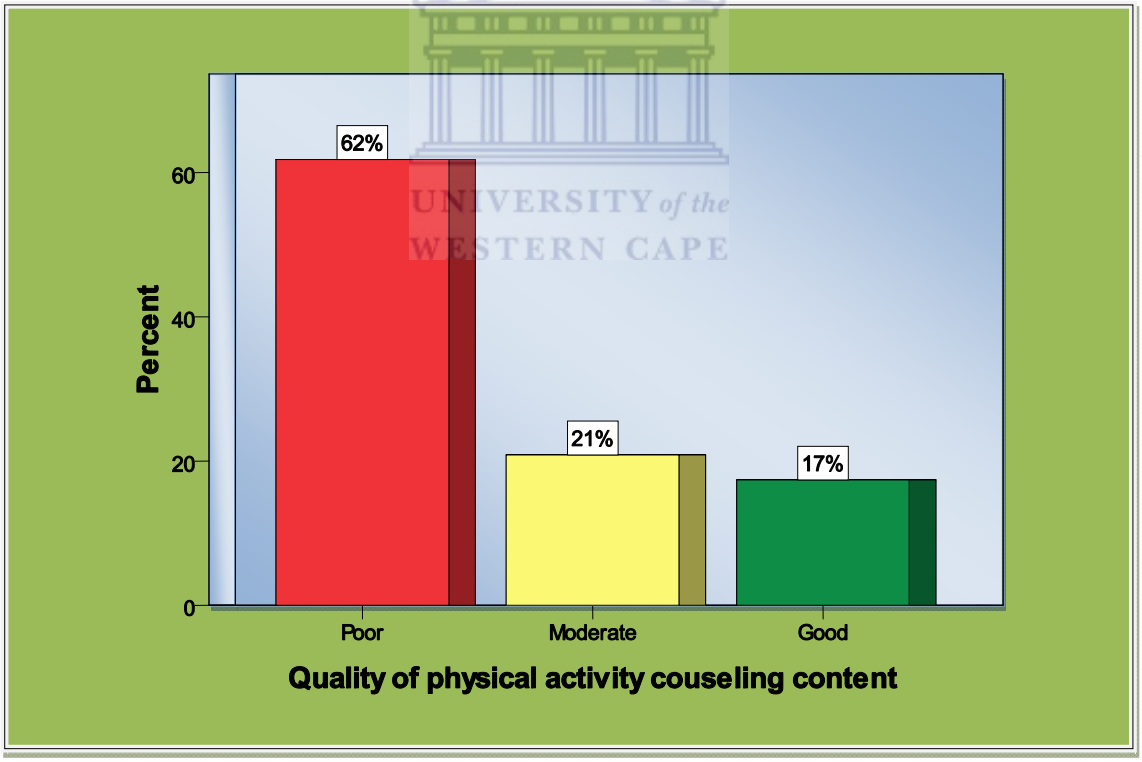


Figure 4.2 Quality of physical activity counselling content (n=144)

Furthermore, specific physical activity counselling ideas used by the participants were identified. Among the 12 physical activity counselling ideas, participants mostly included how long the patients should exercise (50.7%), how hard they should exercise (50.7%) and the benefits of physical activity (42.4%) in their physical activity counselling with patients. The items that were least likely to be included were to give any written material about physical activity during each day's clinic visit (8.3%), a plan to become more physically active in writing (10.4%) and the types of exercises the patients should do (27.8%) as illustrated in table 4.7.

Table 4.7 Frequency of physical activity counselling ideas inclusion in counselling (n=144)

List of physical activity counselling ideas	Frequency	Percent
Do you discuss the topic of physical activity with your patients?	52	36.1
Do you advise your patients to become more physically active?	56	38.9
Do you discuss the benefits of physical activity with your patients?	61	**42.4**
Do you discuss with your patients on their past experiences in physical activities	57	39.6
Do you discuss difficult situations patients may encounter or problems that they might have in trying to become more physically active	49	34
Do you inform your patients on how frequently they should exercise?	49	34
Do you inform your patients on how long they should exercise?	73	**50.7**
Do you inform your patients on how hard they should exercise?	73	**50.7**
Do you inform your patients on the types of exercises they should do?	40	*27.8*
Do you and your patients put the plan to become more physically active in writings?	15	*10.4*
Do you give any written materials about physical activity or exercise during each day's clinic visit?	12	*8.3*
Do you state to the patients that you are planning to discuss their physical activity on a future visit?	43	29.9

Key:

Bold-Mostly included ideas

Underlined-Least included ideas

The physical activity counselling ideas were further analyzed per ranks of doctors. The majority of the interns (56.4%) and specialists (49.1%) informed their patients on how long they should exercise while the registrars mostly (62.5%) informed their patients on how hard they should exercise as illustrated in table 4.8. No significant difference was found between the specific ideas and the ranks of doctors (p=<0.05).

Table 4.8 Physical activity counselling ideas as included in counselling by medical doctors (n=52)

List of PHYSICAL ACTIVITY counselling ideas	Interns (%)	Registrars (%)	Specialists (%)
Do you discuss the topic of physical activity with your patients?	46.2	33.3	31.6
Do you advise your patients to become more physically active?	51.3	35.4	33.3
Do you discuss the benefits of physical activity with your patients?	53.8	37.5	38.6
Do you discuss with your patients on their past experiences in physical activities	41	37.5	40.4
Do you discuss difficult situations patients may encounter or problems that they might have in trying to become more physically active	38.5	31.3	33.3
Do you inform your patients on how frequently they should exercise?	41	29.2	33.3
Do you inform your patients on how long they should exercise?	**56.4**	47.9	**49.1**
Do you inform your patients on how hard they should exercise?	51.3	**62.5**	40.4
Do you inform your patients on the types of exercises they should do?	38.5	25	22.8
Do you and your patients put the plan to become more physically active in writings?	7.7	8.3	14
Do you give any written materials about physical activity or exercise during each day's clinic visit?	10.3	6.3	8.8
Do you state to the patients that you are planning to discuss their physical activity on a future visit?	43.6	29.2	21.1

Key:
Bold-Mostly included idea per rank of doctors.

4.7.1 Reasons for not discussing physical activity with patients

All the participants that indicated that they do not discuss the topic of physical activity with their patients were requested to give a possible reason as to why they did not. This group consisted of (63.9%) of the total sample (n=92). The majority of the participants (51%) stated that they did not have enough knowledge or experience pertaining to physical activity. Other reasons that were indicated were lack of time and physical activity counselling not being their area of specialty as illustrated in figure 4.3.

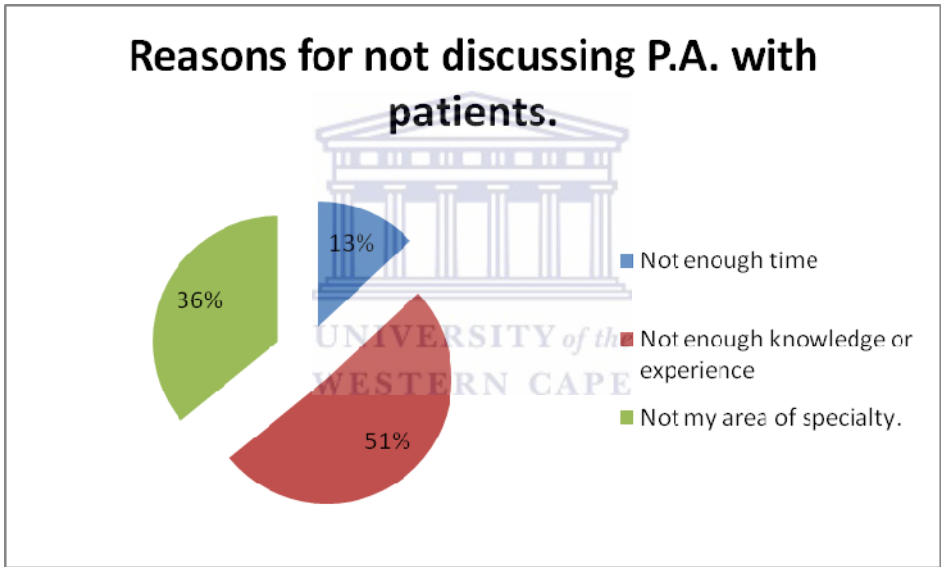


Figure 4.3 Reasons for not discussing physical activity with patients (n=92)

The majority of the participants across all the ranks indicated that they did not discuss the topic of PA with their patients because they did not have enough knowledge or experience to discuss this topic. This reason was reported by 57% interns, 41% registrars and 56% of the specialists as a reason for not discussing physical activity with their patients. Other reasons for not discussing the topic of physical activity with the patients according to the ranks of doctors are illustrated in percentages in Figure 4.4

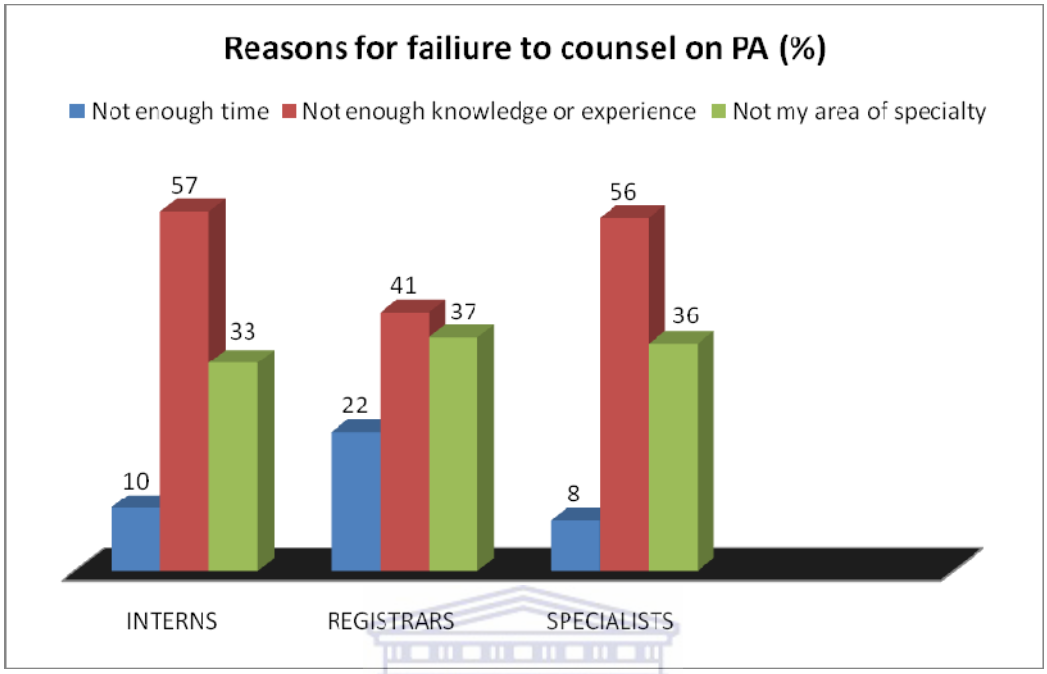


Figure 4.4 Reasons for failure to counsel on physical activity as per ranks of doctors

4.8 FACTORS INFLUENCING THE QUALITY OF PHYSICAL ACTIVITY COUNSELLING PRACTISES AMONG THE MEDICAL DOCTORS

4.8.1 Age

An association existed between age and the quality of counselling practices ($p<0.05$). The majority of the good counsellors were in the younger age groups while only 4%, 4% and 0% of the good counsellors were in the older age groups of 50-54, 55-59 and and 60-64 respectively as illustrated in Table 4.9.

4.8.2 Gender

Most of the male (62.5%) and female (60.4%) participants were categorized as poor counsellors of physical activity. A higher prevalence of female participants (25%) were categorized as good

counsellors compared to the male participants (13.5%) as illustrated in table 4.9. This difference was not statistically significant.

4.8.3 Ranks of doctors

The majority of the participants in the three ranks of doctors were categorized as poor counsellors. 49% of the interns, 64% of the registrars and 68 % of the specialists fell in this category. The percentage of registrars and the specialists in the moderately good counselor's category was equal at 17% each as shown in table 4.9. There was however no statistical significant difference ($p>0.05$)

4.8.4 Physical activity levels

A large majority (92%) of the participants in the sedentary category of physical activity were poor counsellors while almost a third of those in the highly physically active category were good counsellors. None of the participants classified as sedentary were found to be good counsellors as illustrated in table 4.9. A statistically significant association was found between physical activity levels and quality of counselling practices ($p<0.05$).

Table 4.9 Factors influencing the quality of physical activity counselling practises among the participants (N=144)

VARIABLES	Mean age = 36.44 SD (8.56)		
	Poor (%)	**Moderate (%)**	**Good (%)**
AGE GROUPS *			
25-29	52.6	23.7	23.7
30-34	57.6	24.2	18.2
35-39	76.9	11.5	11.5
40-44	56.5	26.1	17.4
45-49	81.1	9.1	9.1
50-54	83.5	0	16.5
55-59	40	40	20
60-64	50	50	0
PHYSICAL ACTIVITY LEVELS *			
Sedentary	92	8	0
Moderate physical activity	59.5	18.9	21.6
Highly physically active	36.8	33.3	29.8
GENDER			
Male	62.5	24	13.5
Female	60.4	14.6	25
RANKS OF DOCTORS			
Interns	49	31	20
Registrars	64.6	16.7	18.7
Specialists	68	17	15

*Significant at 0.05

4.9 SUMMARY

The current study's aim was to identify whether an association existed between the physical activity patterns of medical doctors and their counselling practices on physical activity. A significant number of medical doctors were categorized as sedentary while those that were moderately active and highly physically active did not adequately participate in deliberate leisure time physical activities. A significant association between the participants' physical activity counselling practices and their personal physical activity patterns was found. Other significant differences that were identified were between physical activity levels and gender and between counselling practices and age and physical activity levels. Various reasons given by the medical doctors as to why they do not discuss physical activity with their patients as well as their perceived barriers to physical activity participation were highlighted in this chapter. The results and the implications thereof are discussed in the next chapter.

CHAPTER FIVE

DISCUSSION

5.1 INTRODUCTION

This study aimed to identifying whether a relationship existed between physical activity levels and the counselling practices of practicing medical doctors in Dar es Salaam, Tanzania. The results of the study are discussed and compared with previous studies.

5.2 PHYSICAL ACTIVITY LEVELS OF THE STUDY POPULATION

Physical activity in the context of a lifestyle behavior has been evidently seen to be a workable measure or precaution against the overwhelmingly increasing prevalence of CDL in the developing and the developed world. Nevertheless, engaging in physical activity as a lifestyle has remained low among various populations of the world regardless of them being affected by CDL (Mehan, Surabhi, & Solanki, 2006). Medical doctors are in a suitable position to promote physical activity as a health practice through counselling. In most cases they have the primary encounter with the patients before they are seen by any other health practitioner (Laverty, 2010) and therefore positioning them appropriately for the role of physical activity counselling.

The concern expressed in the previous paragraph is confirmed by the results of the current study. More than a third (35%) of the sample of this study was categorized as sedentary. The findings of the current study are similar to the (39%) of sedentary participants as reported by Frank et al. (2008). The sample of Frank et al. (2008) however comprised medical students who might have been prevented to participate in physical activity due to their studies. The percentage of

sedentary participants in the current study is in stark contrast to that of Bahram, Abbas, Kamal and Fakhro (2003) conducted in Bahrain, that reported 71% of their participants to be sedentary. Although the latter study also used a cross-sectional design, the authors did not report on the different domains of physical activity. These details might have shed some light on the huge discrepancy between the current study and that of (Bahram et al., 2003).

The current study found that younger medical doctors were more physically active than their older counterparts. Contrary to our findings, Bahram et al. (2003) in Bahrain found out those older doctors >45 were more physically active than their colleagues in their 30's and 40's. The proportions of highly physically active doctors were even higher in the age groups above 45 years of age and the author associated this outcome with the increase in BMI among the older doctors though this association was not statistically significant. Since time was pointed out in this study as a major barrier to physical activity participation, we can reasonably argue that younger medical doctors were more preoccupied at work compared to older doctors who in most cases delegate duties to younger and less qualified doctors. The older doctors may therefore have had more time to participate in physical activity than the older doctors. Bahram et al. (2003) categorized physical activity levels as only sedentary and active. This may have influenced the physical activity levels outcome. Abramson et al. (2000) did not find a significant difference in mean age among the US medical doctors.

Female medical doctors were found to be more active than the male medical doctors in the current study. They accumulated more MET-minutes/ week in the work and transport domain of physical activity. This higher levels of physical activity amongst females than males are similar

to the findings of Suija et al. (2010) in Estonia. Although similar in this regard, more active female than male participants, Suija et al. (2010) reported a much higher percentage (90%) of females regarded as physically active. This large discrepancy between the current study and the latter could be attributed to the different settings of these studies. Estonia is a developed European society whereby physical activity facilities and physical activity favorable infrastructure such as paved pedestrian paths are likely to be advanced compared to Tanzania and therefore facilitating more participation in physical activity in females.

When comparing the percentage of females classified as physically active in the current study (41.7%) with that of Bahram et al. (2003) (18.2%), a stark contrast was observed. These differences could however be related to the fact that Bahrain (setting of study of Bahram et al. (2003) is a conservative Muslim society and this may have contributed to lower levels of physical activity among female medical doctors. Although the finding of the current study is promising, all role players should be aware that literature has underpinned numerous obstacles for physical activity amongst females. All efforts should thus be made to encourage physical activity among this group.

Dishman, Sallis and Orenstein (1985) had earlier indicated that there was evidence indicating that lifestyle physical activity such as body building has higher prevalence and adherence rates than fitness-related (particularly aerobic) exercises mainly performed as recreation. Medical doctors are hardly expected to be vigorously active at work. However, the working environment which includes buildings with several stairs, widely spaced wards and at times congested wards may lead to medical doctors participating in work related moderate activity involving walking

from a ward to another, accessing various rooms via stairs and prolonged standing during ward rounds. This could have led to accumulation of more MET minutes/week at work than in transport and recreation among the doctors in Tanzania.

Transport is considered as one of the domains in which an individual can increase his/her levels of physical activity. Walking and cycling to and from work, shopping or just taking a walk are common means of transport that is adopted by many people who intend to improve their physical activity levels. In the current study, female participants accumulated twice as much the mean MET minutes/week compared to males in the transport domain. The nature of transport physical activity that the female medical doctors participated in was not explored in this study, but it could be speculated that walking was the preferred method as participants were responding to either walking or cycling. Furthermore, Garrard (2003) observed that cycling is one of the rare activities among the female working class in urban centers. Window shopping and shopping is one of the common activities among the female working class in an urban setup like Dar es Salaam. This could have contributed to more physical activity reported in the transport domain and more so among female medical doctors. It was difficult to attribute this form of physical activity to a deliberate initiative to participation; however it still came out clearly that there were more female good physical activity counsellors compared to males. It is however possible that some of the female doctors made a deliberate attempt to participate in walking as a health program and were therefore motivated to counsel their patients on physical activity.

A comparison between different categories of medical doctors with regard to their levels of physical activity, showed that interns were more physically active than registrars or specialists.

Interns accumulated more MET-minute/week in all the domains of physical activity than registrars and specialists. The only other study that reported on categories of doctors and their levels of physical activity was that of Abramson et al. (2000). These authors however reported no differences in levels of physical activity among different categories of medical doctors. A possible reason for the difference in levels of physical activity achieved by the different categories in the current study could be that in Tanzania, specialists often work extra hours and therefore may lack time to adequately engage in physical activity, different from interns who may have more free time after normal working hours. Despite this observation, exercise facilities and schedules being inconvenient were reported as barriers among the doctors and not time. This outcome emphasized the need for informing medical doctors about various ways of participating in health benefiting physical activity without necessarily depending on a supervised facility. In fact, the larger population of the Tanzanian community may not afford facility based physical activity and therefore if the doctor has to advise patients to be physically active only in the gym, then the majority of the people will still not participate in physical activity. Informing the doctors on alternative means of becoming physically active which may suit the urban, rural, wealthy and poor, would be a more appropriate approach for a mixed society like Tanzania.

Although this study did not precisely highlight the factors influencing the levels of physical activity of the study sample, literature has shown evidence of physical activity levels to decrease as age increases in various populations (Caspersen, Pereira & Curran, 2000; Risto & Xiaolin, 2000). This decline in physical activity with age seems to hold true for medical doctors too. Several factors such as time constrains, fear of injuries and fear of worsening of an existing disease may be associated with the decline.

5.3 BARRIERS TO PHYSICAL ACTIVITY PARTICIPATION

Barriers to physical activity participation as used in this study can be described as factors that deter or discourage people to engage in physical activity. Barriers to physical activity participation are experienced individually or by populations who share common lifestyle characteristics. Many individuals and populations recognize the health importance of physical activity. However, literature has shown that several barriers still exist (Allison et al. 2005). For health promotion strategies to be effective, it is of vital importance to consider individual's perceptions of barriers to physical activity. Several factors that have been considered as barriers to physical activity as highlighted by literature were presented to participants of the current study. The current study however highlights that few of the barriers presented to the study sample were actually perceived as barriers to physical activity. The only barriers that were perceived to be substantial in hindering participation were tiredness and fatigue from exercises as well as schedules for exercise facilities being inconvenient. This was in stark contradiction to Rogers et al. (2005) in Atlanta Georgia where the medical doctors reported to have been barred from physical activity participation by work schedules, personal responsibilities, personal motivation, and accessibility of physical activity facilities and opportunities. Although these studies could be compared on the bases of both identifying barriers to physical activity among medical doctors, the comparison was done with caution since the study by Rogers et al. (2005) was an intervention study. There was inadequate literature on barriers to physical activity participation among medical doctors. However, some studies sought to identify basic reasons for low participation in physical activity as a health practice. Issues of time, resources, safety, knowledge, work or study commitments were raised by scholars such as (Zunft et al., 1999; Andersen, Blair, Cheskin & Bartlett 1997) over a decade ago and (Crombie et al., 2004) in recent

years. These studies were conducted among the general population and with larger sample sizes and were therefore methodologically different from the current study and comparisons must thus be made with caution.

The current study's effort to find out why the medical doctors did not participate in recreational physical activity interestingly came up with the impression that the doctors did not have barriers to engage in the health practice per se. Medical doctors are members of a hospital community and according to World Health Organization (2007) they are members of the health promoting hospitals team whose role is to improve the quality of health care for patients and themselves, the relationship between hospitals/health services, the community and the environment and the satisfaction of patients, relatives and staff. Further and more detailed research should be conducted to explore more on the barriers of physical activity participation among the medical doctors.

Although some studies have shown that medical doctors have higher levels of physical activity compared to the general population Frank et al. (2008), they are still feeling pressurized by their career schedules in such a way that engaging in a physical activity facility such as a gym and coping with its schedules is hard. Therefore, the actual barrier may not be the schedules of the facility but the doctors' schedule. Nevertheless, the consideration of exercise facilities and schedules as the main barrier to physical activity participation raised questions about whether the doctors knew that health benefiting physical activity may not necessarily be acquired through an established exercise facility such as a gym. Inadequate knowledge on selection of exercises to suit the individual's purpose appeared to have been less, hence making the doctors to engage in

tiring exercises which may not necessarily offer the intended health benefit rather de-motivate their participation. This is thus a pointer to the fact that physical activity intervention programs should consider improving knowledge regarding the minimum requirements for health enhancing physical activity.

Physical activity is still widely perceived as an indoor (enclosed) (supervised) and expensive facility based practice even among health professionals such as doctors. Sallis and Owen (1999) defined physical activity as any bodily movement produced by skeletal muscles that result in energy expenditure, highlighting that schedules of a specific physical activity facility may not be a very important factor to determine physical activity participation. Dishman et al. (1985) actually stated that access to facilities is a necessary but an insufficient facilitator of physical activity participation. Dishman et al. (1985) highlighted that participants who were exercising in unsupervised settings and living close to the exercise setting were more likely to drop out while those that were already active were twice as likely to feel that greater availability of resources would increase their participation compared to the inactive.

Adequate knowledge, motivation and choice of exercise that individuals engage in can determine whether the individual will consider facilities to be a barrier or not. For those individuals who prefer exercises such as walking or running, which can be done anywhere, may not consider access to facilities as relevant. Additionally, for those who exercise with home equipment, which could include stationary bikes, treadmills, and even exercise videos, access to facilities may also not affect physical activity adherence (Sherwood & Jeffery (2000). Our study was conducted in

an urban setting whereby proximity to physical activity facilities may less be blamed compared to costs. Surprisingly the cost of physical activity did not arise as a major barrier to participation.

People perform physical activities for various personal reasons. Some of the commonly highlighted ones as reported by Kieller (2002) include health, physical form, pleasure and well-being, competition and stress management. Data from studies of successful weight-loss maintainers suggest that the optimal amount of exercise for weight control goes beyond current public health recommendations. Indeed, exercises for weight control may be close to an hour of moderate-to-vigorous activity on most days of the week (Sherwood & Jeffery, 2000). The fact that medical doctors in Tanzania indicated that among the most important barriers to their participation was fatigue and tiredness, created an impression that the choice of their physical activities was motivated by factors such as weight loss and body building which could equally be fatiguing if not performed under specific procedures such as warm up and cool down. Heavier individuals may be more sedentary than lighter-weight individuals in part because, for heavier people, physical activity is less pleasurable Sherwood and Jeffery (2000) and may therefore use an excuse of fatigue and tiredness to avoid physical activity.

Our research focus was on physical activity that is adequate to offer health benefits regarding CDL such as diabetes, hypertension and other cardiovascular diseases. Studies have shown that accumulation of 30 to 60 minutes of moderate activity such as walking, dancing on most days of the week can offer the required benefits (American College of Sports Medicine, 2007). Furthermore, Haennel and Lemire (2002) assessed risk reduction of various CDL such as stroke, diabetes mellitus and hypertension with increase in levels of physical activity and identified that

the health benefits were at the optimum with moderate activity and did not indicate further reduction in risk with very vigorous activity.

The barriers perceived by participants in the study should be addressed in health promotion strategies as they are not necessarily barriers. Furthermore, in order for medical doctors to offer advice to patients regarding overcoming these barriers, they should be knowledgeable about these. In addition they can become good role models and thus lead by example.

5.4 PHYSICAL ACTIVITY COUNSELLING PRACTICES

More often, a medical doctors' word is usually taken with seriousness and much weight because it concerns the recipient's health. Patients and the general population are known to trust doctors' advice concerning their health. In a similar accord, the doctors are in a suitable position to influence patient's physical activity participation. In fact medical doctors are considered to be a valuable resource for encouraging patients to become more active (Rogers et al. 2005). Meriwether, Lee, Lafleur and Wiseman (2008) indicated that the five A's (Assess, Advise, Agree, Assist and Arrange) model of counselling was seen to be appropriate for smoking cessation as well as physical activity participation.

In the current study it was indicated that the majority of the medical doctors were poor counsellors of physical activity. They failed to include important components of physical activity in their discussion with their patients. It was interesting to note that most of the doctors talked to their patients about how long and how hard they should exercise, and the benefits of physical activity more than any other component of physical activity suggested. Medical doctors at MNH and MOI participating in this study hardly gave any written materials pertaining to physical

activity to their patients, they also least put a plan of physical activity in writing and advice regarding types of exercises suitable. Contrary to the current study's findings, Sciamana et al. (2004) highlighted that the medical doctors in USA mostly informed their patients about the types of physical activities they should do, reasons to be physically active and discussed their past experiences on physical activity. Nevertheless there were some similarities pertaining to the areas that the doctors least discussed with their patients. They least gave written materials, gave a written exercise plan or planned to discuss physical activity with the patients in future.

The ideas that were presented to the medical doctors entail the major content areas that are consistent with national activity guidelines for physical activity (Sciamanna et al., 2004). Generally, these ideas would require the doctor to not only provide details of intensity, frequency, dangers and benefits of physical activity, but also putting it in writing for better understanding and memory as well as details of follow up. It is therefore believed that if a medical doctor includes over eight ideas of the 12, he will be in a position to influence the patient to modify his lifestyle health behavior towards more participation in physical activity.

In the present study however, participants prioritized the ideas of intensity and duration of exercise more than the other ideas. This could be a suggestion that the doctors were concerned about any danger that could be related to physical activity when performed at too high an intensity and for a long time. This advice could be interpreted more as a warning against physical activity than a motivation to participate. Close to two decades ago Gloag (1992) indicated that there were fears among the medical fraternity that high intensities of physical activity have fatal health risks. Furthermore, Shaper, Wannamethee, and Weatherall (1991) revealed a slightly

increased risk of heart attacks with extreme activity among people with symptoms of ischaemic heart disease. However, recent studies have highlighted that incidences of exercise related sudden death (ERSD) remain undefined but low as pointed out by Edwards et al., (2010) that 1-2 deaths out of 100,000 physically active individuals may occur. However, regardless of the low incidence of ERSD, medical doctors have always taken this seriously due to the fact that it is unsuspected. They therefore insist on Pre-participation screening of physical activity candidates at a young age including electrocardiograms. This has been seen to decrease sudden death by 90% from 3.6 to 0.4 deaths per 100,000 participants (Wood, 2007). The fact that medical doctors often counselled patients on duration and intensity regardless of the low incidence of ERSD, was also seen as lack of knowledge regarding the benefits of physical activity pointing to the fact this must be emphasized in medical schools curriculums.

Although the doctors may have prioritized intensity and duration of physical activity as a precaution for heart attack with high intensity of physical activity, it would be necessary to insist on thorough cardio examination prior to a physical activity prescription. Nevertheless, it would not be appropriate for medical doctors to create fear of a heart attack to every patient by putting more emphasis on duration and intensity as a risk and ignore other important ideas regarding physical activity such as types of physical activity, frequency/ week, putting the plan in writing, follow up and evaluation. In fact, it is more appropriate to address patient's fears to physical activity by emphasizing more on the benefits and how safely physical activity can be performed rather than putting more weight on physical activity related tragedies such as sudden cardiac deaths (Andersen et al., 1997).

It is expected that when physical activity counselling is done appropriately, most of the barriers experienced by patients will be overcome. While addressing Physician-based Assessment Counselling for Exercise (PACE) Patrick et al. (1994) recommended an approach that could be used to alleviate some of the barriers usually expressed by patients who are contemplating physical activity participation. Although these recommendations were suggested more than a decade ago, they still are relevant today and are shown in table 5.1.

Table 5.1 Approaches to physical activity barriers resolution

Barrier	**Solution approach**
I do not have time.	We're only talking about three 30 minute sessions each week. Can you do without three television shows a week?
I am usually too tired to exercise.	Regular activity will improve your energy level. Try and see for yourself.
The weather is too bad.	There are many activities you can do in your home, in any weather.
Exercise is boring	Listening to music during your activity keeps your mind occupied. Walking, biking, or running can take you past lots of interesting scenery.
I do not enjoy exercise.	Do not "exercise." Start a hobby or an enjoyable activity that gets you moving.
I get sore when I exercise.	Slight muscle soreness after physical activity is common when you are just starting. It should go away in 2 to 3 days. You can avoid this by building up gradually and stretching after each activity.

Medical doctors need to be further informed on how much physical activity is necessary and how well health enhancing physical activity can be incorporated in a lifestyle either at home, at work or during leisure time. Medical doctors whose main aim of participating in physical activity is to have health benefits, will benefit from the information which will first alleviate supervised

exercise programs as barriers to participation as well as reduce the mentality that physical activity must be strenuous to offer health benefits.

5.5 PHYSICAL ACTIVITY AND COUNSELLING PRACTICES

The confidence to counsel a patient on a healthy lifestyle behavior based on personal behavior is strongly founded on deliberate personal practices and hardly on involuntary practices. Consequently doctors who would be highly physically active in their recreation activities, would be more confident and even stand a better position to advise on lifestyle change. This association was reported by Harsha, Saywell, Thygerson, and Panozzo (1996) over a decade ago when they highlighted that medical doctors' personal physical activity practices would not only improve their personal health but also that of their patients. More recently, Howe et al. (2010) shared the same view where they stated that many doctors lacked confidence in their ability to counsel patients regarding lifestyle because their deliberate Personal behaviors including regular physical activity and better training in counselling techniques were inadequate.

The current study's hypothesis is that sedentary medical doctors are poor counsellors of physical activity and vice versa. It is believed that doctors who were physically active during leisure time/ recreation activities, stood a better position to counsel on physical activity because they already had a personal initiative to participate. The study indeed highlighted that the majority of the participants were poor counsellors regarding physical activity and that a strong relationship existed between physical activity participation and counselling practices.

Literature informs us that this was the first study in Africa to investigate this phenomenon. Studies in other parts of the world including USA and Colombia by (Duperly et al. 2009; Frank

et al. 2008; & Foster et al. 2002) did a similar investigation and were in agreement with the current study's results. Some of these studies went further to assess the confidence and attitude towards counselling on physical activity and reported that both confidence and positive attitude improved with increase in physical activity levels among medical doctors. The association between physical activity levels and physical activity counselling practice was strong regardless of the setting of the mentioned studies in comparison to Tanzania. Although some of the studies used medical students and with bigger sample sizes, they were able to identify a positive attitude, more confidence and motivation to counsel on physical activity among the physically active participants compared to the sedentary counterparts. In the current study it was interesting to note that female medical doctors had doubled the mean MET/ week in the transport domain and were equally twice as good counsellors compared to the male doctors.

It is now more evident that role modeling on health behavior counselling is important. It is more important because it involves sharing of experiences that a doctor may have gone through already so that when the patient expresses similar barriers, then the doctor will be in a position to help the patient alleviate the barrier based on experience. More so, benefits of physical activity may better be shared and accounted for by the doctor to the patient when some experience has been gained rather than on the bases of theoretical knowledge only.

5.6 REASONS FOR NOT DISCUSSING PHYSICAL ACTIVITY WITH PATIENTS

Numerous studies have indicated that counselling to promote physical activity among various populations is effective in enhancing participation (Eden, Orleans, Mulrow, Pender & Teutsch, 2002). Despite the fact that medical doctors understand that they have a role pertaining to

counselling patients on physical activity, some reasons as to why they do not engage in this practice exist (Walsh et al., 1999). Literature has highlighted factors such as inadequate time, lack of knowledge on matters related to physical activity and inadequate counselling skills as major barriers to counselling (Walsh et al., 1999). The reasons for not engaging in this health promoting practice were explored in the current study. Inadequate knowledge or experience came out clearly as the main hindering factor to counselling followed by the fact that medical doctors did not consider physical activity counselling to be their area of specialty. Time was least mentioned as a reason for not counselling.

5.6.1 Issues of knowledge

Matters related to knowledge regarding any field of medical doctors' practice can be traced back to the medical schools' curriculums. It was not the aim in the current study to assess the content of medical school's curriculum. However, determination of the content of some medical school's curriculum was purely based on literature. In the current study, lack of knowledge or experience was the main reason as to why physical activity counselling was not discussed with the patients. According to

McKenna, Naylor, and McDowell (1998) in the UK, knowledge or experience was hardly a reason for failure to counsel. In the United States, Abramson et al. (2000) reported that inadequate knowledge or experience was among the least reported reasons for failure to counsel on physical activity. Although the medical doctors in the United States did not consider inadequate knowledge or experience to be an important reason for failure to counsel patients on physical activity, two years later Foster et al. (2002) found a different scenario when he assessed the knowledge of US medical doctors on issues of physical activity. The majority of them believed that only three days of physical activity were required per week while 24% believed

that 4 days were necessary. Only the minority could quote five days or more and the appropriate intensity of 25-30 minutes per day. The information about how much knowledge the US doctors had concerning physical activity was gathered through, among others, open ended questions which gave them an opportunity to state clearly what they knew. This was a confirmation of inadequate knowledge which was not identified when the same information was gathered through a mailed questionnaire in a cross-sectional survey by (Abramson et al., 2000). In the current study, the participants admitted instantly that inadequate knowledge or experience pertaining to physical activity counselling was the major barrier to counselling and was concurrent with the fact that the majority of them excluded most of the important ideas pertaining to physical activity and were therefore poor counsellors of physical activity. This result raised curiosity to discuss the curriculums that medical doctors pass through.

Physical activity being a lifestyle component of a human life, may not be a major constituent of any medical school curriculum with a bio-medical approach of training. CDL risk reduction has not been a central component of medicine training globally (Unal, Critchley, and Capewell, 2005). Changing of this trend may not be achieved unless there is expression of need to incorporate lifestyle demands that are attached to the majority of the populations. This may call for extension of the medical student's scope of training to incorporate health lifestyle assessment skills including those of physical activity and eventually broaden the doctors' knowledge on physical activity prescription, precautions, and contraindications and follow up.

Incorporating physical activity and body movement training in the curriculum of medical students will not only address the ignorance about physical activity for medical doctors' personal

health benefits but also equip them with broader social and psychological skills to influence patients who are in various stages of physical activity participation considerations. These include Pre-contemplators (have no desire to exercise), Contemplators (do little or none but are interested in participating in physical activity) and actives (are already participating but need motivation and encouragement to continue) as pointed out by Gauer and O'Connor (n. d).

It was not the aim of this study to describe the details of a physical activity module recommended for medical schools. However, the Physicians-based Assessment and Counselling for Exercise (PACE) initiative should be pointed out. This has been tested several times for effectiveness and found workable at least in the short term (Van Sluijs, Van Poppel, Stalman, & Mechelen, 2005; Calfas et al., 1996, & Long et al., 1996). According to Calfas et al. (1996) PACE is just one among several other structured counselling protocols that have efficiently led to change of health behaviors such as smoking. PACE is designed to bring about promotion of long term participation in physical activity. Its intervention is intended to alter social and psychological components that can influence physical activity. These include increased supportive behaviors from families and friends hence encouraging or permitting participation, improved self efficacy and confidence that physical activity is achievable, promote awareness of benefits of physical activity and reduce any perceived barriers to the same (Calfas et al., 1996).

At MNH and MOI, issues of physical activity, not being their area of specialty, were mentioned by approximately one-third of the participants. The fact that physical inactivity is a risk factor to CDL makes all medical doctors to be part of physical activity counselling regardless of specialty. Citing of physical activity as not an area of specialty for a reason of failure to counsel on

physical activity was considered as lack of knowledge regarding their role in health promotion and preventive medicine for control of CDL.

The need to have physical activity counselling competence among the medical doctors in Tanzania lies within the Tanzanian community. Since studies have illustrated that CDL are on the rise both in the rural and urban Tanzania, then the consequent demand for competent counselling to promote physical activity participation as a control of CDL is too high. As mentioned before in this study, the knowledge pertaining to physical activity among medical doctors will carry health benefits both to the doctors themselves and to the patients.

5.6.2 Time

On several occasions time has always been cited as a hindrance expressed by stakeholders in the effort to accomplish health promoting strategies that are already in place. Time has conspicuously been cited as a barrier for physical activity participation and in this context for physical activity counselling as highlighted by Kennedy and Meeuwisse (2003) in Canada, Leinonen et al., (2007) in Finland and Lobelo et al., (2009) in USA. In the developed world, patients are much more eager and anxious to know more about their health. They easily engage medical doctors into longer discussions about their health and therefore end up making doctors cite as a barrier to engaging in physical activity counselling which may be coming as an extra duty. It should be acknowledged sincerely that medical doctors may have limited time to incorporate a comprehensive physical activity counselling in their congested sessions with patients.

In the current study, time was least highlighted as a reason for failure to counsel patients on physical activity. However, since this study recommends that medical doctors engage in physical activity counselling, time is likely to arise as a challenge in future as a result of the time that they will be spending doing a comprehensive physical activity counselling. In order to ease the work load of a medical doctor and eventually achieve the aim of counselling patients on physical activity, physiotherapists were identified as trained medical personnel pertaining to physical activity and would stand an appropriate position in assisting in counselling as pointed out by Leinonen et al. (2007). However, this would only ease the load for the doctors but it would not position them appropriately in terms of knowledge and would therefore still require them to be trained. The role of physiotherapists in this case therefore, would be more effective if only they would be involved in physical activity and body movement training in medical schools. It would be reasonably appropriate to have both the physiotherapists and medical doctors possessing the physical activity knowledge in the spirit of inter-professional collaboration as reported in Health and Social Care Professions Network (2001).

Our study explored both the barriers to counselling on physical activity and barriers to personal participation in physical activity. However, we observed that all the barriers were revolving around knowledge. And now that knowledge is power, further studies will be required especially in Africa to find out the in depth of hindrances to physical activity counselling and participation.

5.7 SUMMARY

This chapter discussed the findings of the study. It was highlighted that medical doctors in Tanzania are not engaging in physical activity sufficiently. The impacts of these decreased levels of physical activity on their counselling practices were also discussed. The next chapter

summarizes and concludes the study. Recommendations for relevant role players and for further research are also outlined in the next chapter

CHAPTER SIX

SUMMARY, SIGNIFICANCE, CONCLUSION AND RECOMMENDATIONS AND LIMITATIONS

6.1 INTRODUCTION

The final chapter of the thesis summarizes and concludes the study. Finally, recommendations for relevant role players and future research are outlined.

6.2 SUMMARY

Literature indicates that physical activity is a health practice that can prevent CDL. It is recommended that medical practitioners, among them medical doctors, should hold the responsibility of counselling patients on physical activity. Medical doctors usually have the first encounter with the patients before referral to other professionals. They therefore have an appropriate opportunity to influence patients' physical activity behavior through counselling. However, studies have shown that their personal physical activity behaviors can influence the quality of their counselling practices. Hypothetically, a physically active medical doctor is likely to be a good counselor of physical activity and vice versa.

The main aim of this study was to determine whether an association existed between the physical activity patterns of Tanzanian medical doctors and their counselling practices pertaining to physical activity. The study was conducted in Dar es Salaam region of the United Republic of Tanzania and involved two national and referral hospitals i.e. Muhimbili National Hospital and Muhimbili Orthopedic Institute.

A quantitative cross sectional survey was conducted and data was collected with a questionnaire. Of the 191 doctors approached, 144 voluntarily participated in the study. Data was analyzed with the Statistical Packages for Social Sciences (SPSS) version 17.

The study found that 35% of the participating doctors were considered sedentary. The highest mean MET minute/week was accumulated at work and the lowest during leisure time. Females were twice likely to be physically active in the transport domain. Females were also significantly more likely to be considered good counsellors when compared to their male counterparts. Most of the participating doctors reported that they included ideas regarding intensity and duration of exercise in their counselling regarding physical activity. Lack of knowledge, not area of specialty and time were offered as possible reasons for not offering physical activity counselling to patients.

It was acknowledged that medical doctors required more training on matters of physical activity counselling in order to position them better for the counselling task. Physiotherapists were cited to be part of the medical team that is trained in matters related to physical activity. It would therefore be appropriate in the short term for the medical doctors to be referring patients to them for counselling and in the long term involve them in medical doctors' training for the same purpose. Lack of knowledge also featured when doctors expressed barriers to personal physical activity participation as well as inconvenient schedules for the physical activity facilities, tiredness and fatigue. This was an indication that medical doctors considered health benefiting physical activity to be only the one that is practiced in a supervised facility such as the gym. The choices of exercises that they tried to participate in could have contributed to the tiredness and

fatigue feeling. Furthermore, they may not have observed the recommended physical activity procedures such as warm up and cool down. Professional knowledge to the doctors provided through training would help to alleviate these barriers, get doctors to participate and eventually counsel patients to participate as well.

6.3 CONCLUSION

CDL have shown to be on the increase in both developed and developing countries in recent years. Tanzania is not exempted from this trend. Physical activity, an economical and manageable way of controlling CDL should be emphasized among the members of the society. Since the prevalence of CDL is alarming, the stakeholders, among them medical doctors, are being held responsible for offering a professional solution. Although the medical fraternity is preoccupied in curative management of disease, time has come when prevention should be given an upper hand. Prevention can only be founded on knowledge of the problem and later derive the means of dealing with it. This brings the whole idea of physical activity counselling as a preventive measure against CDL. However, before this knowledge is disseminated to the entire general population, the same needs to be entrenched among the medical practitioners including medical doctors. Knowledge on physical activity is intended to change an individual's lifestyle behavior towards participation. Once this knowledge is well achieved by the medical doctors initially, they will themselves be motivated to participate and consequently motivate the general population to do the same.

Technology and urbanization have made lifestyle more sedentary than decades ago in Tanzania. The endeavor of this study therefore is to encourage deliberate physical activity participation among the people in order to reverse this trend.

6.4 RECOMMENDATIONS

The following recommendations are proposed based on the findings of the present study.

- In order to encourage and educate the general public on physical activity participation, it will be appropriate to give support to the medical doctors to also participate and become role models. Employers such as Ministry of health and private hospitals administration can support this initiative by making work places to be physical activity friendly. Fitting facilities such as hot water bathroom and changing rooms will encourage those who may want to come to work walking or riding to freshen up and be ready for work. For those who can afford, facilities such as treadmills and stationary cycles for members of staff can make the work place to be more physical activity friendly.

- In order to overcome the barriers related to knowledge, the medical schools' curriculums should incorporate modules or courses on physical activity. The study recommends that the Ministry of health in collaboration with medical schools and physical activity professionals should review the medical school's curriculum for this purpose.

- In order for physiotherapists to be able to participate in medical schools' training in the area of physical activity, more of them need to acquire postgraduate levels of training as a facilitator to quality short courses and long term training for medical doctors. This study

recommends that the Ministry of Health, autonomous medical institutions and independent funders to offer their support in achieving this. Furthermore, the physiotherapists are also challenged to look forwards to postgraduate studies.

- The study recommends that respective hospitals should establish an inter-professional collaboration forum between physiotherapists and doctors geared toward organized campaigns to stimulate the communities to participate in physical activity.

- Outdoor physical activity e.g. jogging and cycling which is highly recommended for health benefits requires infrastructural suitability such as level playing grounds, pedestrian pavements besides main roads and security. For this reason, this study recommends to the government that through her usual development projects such as road constructions and establishment of recreation facilities, outdoor physical activity suitability should be considered.

- Further research is recommended in order to fill gaps such as the actual reasons as to why medical doctors fail to participate in physical activity, assess the suitability of physical activity counselling approaches such as PACE in the African context and establish the responses of the populations towards a healthier physical activity lifestyle following counselling and use of counselling approaches such as PACE.

6.5 LIMITATIONS OF THE STUDY

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

- Data was collected by means of a self administered questionnaire and is thus based on self report. This type of measurement is open to bias and misinterpreting. However,

growing evidence exist that measures such as these used in the study are generally reliable and valid.

- Data of the study was analyzed cross-sectionally; therefore causal inferences cannot be made. Caution should be exercised in interpreting the results in the absence of longitudinal data.
- The sample included medical doctors from the two main medical institutions in Tanzania only. Because of this, generalization of the findings to other medical doctors in the country is thus limited.
- The response rate was affected by the busy schedules of the participants approached for participation in the study. Despite consistent follow-up, some participants still failed to return questionnaires.

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LIST OF APPENDICES

APPENDIX A

PHYSICIANS PHYSICAL ACTIVITY PATTERNS AND THEIR ADVICE ABOUT CHRONIC DISEASES OF LIFESTYLE RISK REDUCTION IN TANZANIA. QUESTIONNAIRE FOR MEDICAL DOCTORS/ PHYSICIANS.

Dear respondent,
Please answer all the questions as per the guide lines in every section. Do not write your name on the questionnaire. Select your response by using (√) or write your answer in the boxes or space provided respectively.

SECTION A: CORE DEMOGRAPHIC INFORMATION.

CODE		M	F
1	Sex (*Record Male / Female)*		

		dd	mm	year
2	What is your date of birth? *Don't Know 77 77 7777*			

		Years
3	How old are you?	

		Intern	Registrar	or a Specialist?
4	Do you practice as an			

		M	S	D
5	Marital status			

SECTION B: CORE PHYSICAL ACTIVITY INFORMATION.

Next I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person. Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores, harvesting food/crops, fishing or hunting for food, seeking employment. *[Insert other examples if needed]*. In answering the following questions 'vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate, 'moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.

WORK

6-1	Does your work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking *[or carrying light loads]* for at least 10 minutes continuously?	*Yes 1* ☐ *No 2* ☐ *If No go to 6-4*
6-2	In a typical week, on how many days do you do moderate-intensity activities as part of your work?	Number of days ☐
6-3	How much time do you spend doing moderate-intensity activities at work on a typical day?	Hours : minutes ☐☐
	The next questions exclude the physical activities at work that you have already mentioned. Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to market, to place of worship	
6-4	Do you walk or use a bicycle *(pedal cycle)* for at least 10 minutes continuously to get to and from places?	*Yes 1* ☐ *No 2* ☐ *If No go to 6-7*
6-5	In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places?	Number of days ☐

6-6	How much time do you spend walking or bicycling for travel on a typical day?	Hours :minutes ☐☐
	Recreational activities	
	The next questions exclude the work and transport activities that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities (leisure),	
	Question	*Response*
6-7	Do you do any vigorous-intensity sports, fitness or recreational *(leisure)* activities that cause large increases in breathing or heart rate like *[running or football]* for at least 10 minutes continuously?	*Yes 1* ☐ *No 2* ☐ *If No go to 6-10*
6-8	In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational *(leisure)* activities?	Number of days ☐
6-9	How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?	Hour : minutes ☐☐
6-10	Do you do any moderate-intensity sports, fitness or recreational *(leisure)* activities that cause a small increase in breathing or heart rate such as brisk walking, *[cycling, swimming, and volleyball]* for at least 10 minutes continuously?	*Yes 1* ☐ *No 2* ☐ *If No go to 6-13.*
6-11	In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational *(leisure)* activities?	Number of days ☐
6-12	How much time do you spend doing moderate-intensity sports, fitness or recreational *(leisure)* activities on a typical day?	Hours: minutes ☐☐

	EXPANDED: Physical Activity **Sedentary behavior**	
	The following question is about sitting or reclining at work, at home, getting to and from places, or with friends including time spent sitting at a desk, sitting with friends, traveling in car, bus, train, reading, playing cards or watching television, but do not include time spent sleeping.	
6-13	How much time do you usually spend sitting or reclining on a typical day?	Hours: minutes ☐☐

SECTION C.

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.

7	STATEMENTS	Strongly Agree.	Agree	Disagree	Strongly Disagree
7-1	Exercising takes too much of my time.	SA	A	D	SD
7-2	Exercise tires me.	SA	A	D	SD
7-3	Places for me to exercise are too far away.	SA	A	D	SD
7-4	I am too embarrassed to exercise.	SA	A	D	SD
7-5	It costs too much money to exercise.	SA	A	D	SD
7-6	Exercise facilities do not have convenient schedules for me.	SA	A	D	SD
7-7	I am fatigued by exercise.	SA	A	D	SD
7-8	My spouse (or significant other) does not encourage exercising.	SA	A	D	SD
7-9	Exercise takes too much time from family relationships	SA	A	D	SD
7-10	I think people in exercise clothes look funny.	SA	A	D	SD
7-11	My family members do not encourage me to exercise.	SA	A	D	SD
7-12	Exercise takes too much time from my family responsibilities.	SA	A	D	SD
7-13	Exercise is hard work for me.	SA	A	D	SD
7-14	There are too few places for me to exercise.	SA	A	D	SD

SECTION D.

Below are some physical activity ideas that can be discussed between you and the patient. Please answer either YES or NO or select an answer by an indication of a tick (√) where applicable.

8	**QUESTIONS**	**YES**	**NO**
8-1	Do you discuss the topic of physical activity with your patients?		
8-1b	If (8-1) above is NO, give a reasons:- Not enough time ☐ Do not believe that it offers any benefits ☐ Not enough knowledge or experience ☐ Not my area of specialty ☐		
8-2	Do you advise your patients to become more physically active?		
8-3	Do you discuss the benefits of physical activity with your patients?		
8-4	Do you discuss with your patients on their past experiences with physical activity?		
8-5	Do you discuss the difficult situations patients might encounter or problems they might have in trying to become more physically active?		
8-6	Do you inform your patients on how FREQUENTLY they should exercise?		
8-7	Do you inform your patients on how LONG they should exercise?		
8-8	Do you inform your patients on how HARD they should exercise?		
8-9	Do you inform your patients on the TYPES of exercise they should do?		
8-10	Do you and your patient put the plan to become more physically active in writing?		
8-11	Do you give any written materials about physical activity or exercise during each day's clinic visit?		
8-12	Do you state to the patients that you are planning to discuss their physical activity on a future visit?		

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

APPENDIX B

UNIVERSITY OF THE WESTERN CAPE

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

CONSENT FORM

Title of Research Project:

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

Participant's name……

Participant's signature……

Date……

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. J Phillips.

University of the Western Cape

Private Bag X17, Belville 7535

Telephone: (021)959-2542

Cell:

Fax: (021)959-1217

Email: jphillips@uwc.ac.za

APPENDIX C

INFORMATION SHEET

Project Title: Physicians physical activity patterns and their advice about chronic diseases of lifestyle risk reduction in Tanzania.

What is this study about?

This is a research project being conducted by **Wallace M. Karuguti**, a master's student at the University of the Western Cape. We are inviting you to participate in this research project because you are a Doctor by profession practising at either Muhimbili National Hospital or Muhimbili orthopaedic Institute and the information you provide to us will be of great importance in this study. The purpose of this research project is to find out the association between physical activity levels and counselling practices among medical doctors for prevention of chronic diseases of lifestyle.

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

You will be asked to fill a self administered questionnaire with four sections (A,B,C and D). This will take you a maximum of 15-20 minutes to answer the questions in all the sections. The questionnaires will be distributed to you at your place of work and will be collected at the same 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, our questionnaire will not require you to put your identity neither shall we require any information that identifies you in person.

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

In accordance with legal requirements and/or professional standards, we will disclose to the appropriate individuals and/or authorities information that comes to our attention concerning child abuse or neglect or potential harm to you or others.

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?

The benefit to you is the motivation that regular physical activity is important for health not only to the patients you treat but also to you.

The results may also help the investigator learn more about the association between physical activity levels and counselling practices among medical doctors in the effort to prevent chronic diseases of lifestyle. The information which will be gathered will help in improving the doctor's consideration to include detailed and comprehensive physical activity counselling in their prescription for patients. We hope that, in the future, other people might benefit from this study through improved understanding of the significance of physical activity levels as a predictor to patients counselling on physical activity by doctors.

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

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

What if I have questions?

This research is being conducted by ***Wallace M. Karuguti*** *a masters physiotherapy student* at the University of the Western Cape. If you have any questions about the research study itself, please contact:-

Mr. Wallace M. Karuguti.
Muhimbili Orthopaedic Institute
P.O. Box 65474,
Dar es Salaam
Tanzania.
Cell phone +254753016019 or +27799751600
E-mail wallacem80@yahoo.co.uk

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

Head of Department: Prof. J Phillips

Dean of the Faculty of Community and Health Sciences: Prof. R. Mpofu.

University of the Western Cape

Private Bag X17

Bellville 7535.

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

APPENDIX D

VIWANGO VYA MAZOEZI YA VIUNGO VYA MADAKTARI PAMOJA NA USHAURI WAO KATIKA JUHUDI ZA KUPUNGUZA MAGONJWA SUGU YANAYOTOKANA NA MTINDO WA MAISHA YA WATU NCHINI TANZANIA

DODOSO KWA MADAKATARI / MADKARI WA VIUNGO.

Mpendwa Mshiriki,

Tafadhali jibu maswali yote kulingana na mwongozo uliotolewa katika kila sehemu. Usiandike jina lako kwenye dodoso hili. Chagua jibu lako kwa kuweka alama ya vema (√) au andika jibu lako kwenye kisanduku au nafasi iliyotolewa kwa mfuatano huo.

SEHEMU A: TAARIFA MUHIMU ZA KITAKWIMU.

MSIMBO		Mme	Mke
1	Jinsi (*Onyesha Mme / Mke)*		

		Siku	mwezi	mwaka
C2	Ulizaliwa lini? *Kama hujui andika 77 77 7777*			

		Miaka
3	Una miaka mingapi?	

		Mwnf	Mrajisi	au Mtaalam
4	Unashiriki kama			

		Nimeoa/olewa	Bado	Mjane/Mgane
5	Hali ya Ndoa			

Tafsiri hii imefanywa na Idara ya Uhuruguzi wa Kiswahili, UDSM.

Pendo S. Malangwa

DIRECTOR
INSTITUTE OF KISWAHILI RESEARCH
UNIVERSITY OF DAR ES SALAAM

SEHEMU B: TAARIFA MUHIMU KUHUSU MAZOEZI YA VIUNGO.

Pili nitakuuliza kuhusu muda uliotumia kufanya aina mbalimbali za mazoezi ya viungo kwa wiki nzima. Tafadhali jibu maswali haya hata kama wewe mwenyewe unajiona kuwa siyo mtu wa mazoezi. Fikiri kwanza muda unaotumia kufanya kazi. Ifikirie kazi kama vitu unavyopaswa kufanya kama vile kazi za kulipwa au zisizo za kulipwa, masomo/mafunzo, majukumu ya kifamilia, uvunaji wa mazao ya chakula/ mazao ya biashara, uvuvi au uwindaji kwa ajili ya chakula, kutafuta kazi. *[Ingiza mifano mingine kama ipo]*. Katika kujibu maswali yafuatayo 'shughuli ngumu' ni shughuli zinazofanywa kwa kutumia nguvu nyingi na husababisha kuongeza kasi ya upumuaji na mapigo ya moyo, 'shughuli za kawaida' ni shughuli zinazofanywa kwa kutumia nguvu ya kawaida na husababisha ongezeko dogo la kasi ya upumuaji na mapigo ya moyo.

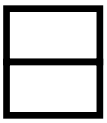
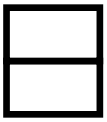
KAZI

6-1	Je, kazi yako ni shughuli za kawaida ambazo zinaweza kusababisha ongezeko dogo tu la kasi ya upumuaji au mapigo ya moyo kama vile utembeaji wa haraka haraka *[au ubebaji wa mizigo myepesi]* angalau kwa dakika 10 mfululizo?	*Ndiyo 1* ☐ *Hapana 2* ☐ *Kama jibu ni Hapana, nenda 6-4*
6-2	Kwa wiki nzima, ni katika siku zipi wewe hufanya shughuli za kawaida kama sehemu ya kazi yako?	Idadi ya siku ☐
6-3	Wewe hutumia muda gani kufanya shughuli za kawaida kazini kwako?	Saa : dakika ☐☐
Sehemu inayofuata haihusishi mazoezi ya viungo yanayotookana na kazi unazofanya ambazo tayari umeyataja. Sasa hivi ningependa nikuulize njia ya usafiri ambayo kwa kawaida unaitumia kwenda na kurudi katika sehemu mbalimbali. Kwa mfano, kwenda kazini, kununua vitu, sokoni au katika sehemu ya ibada.		

6-4	Je, huwa unatembea au unatumia baiskeli *(baiskeli ya kukanyaga)* angalau kwa dakika 10 mfululizo kutoka sehemu moja hadi nyingine?	*Ndiyo 1* *Hapana 2*  *Kama jibu ni Hapana nenda 6-7*
6-5	Kwa wiki nzima, ni katika siku ngapi unatembea au unaendesha baiskeli kwa angalau dakika 10 mfululizo kwenda na kurudi katika sehemu mbalimbali?	Idadi ya siku 
6-6	Hutumia muda gani kutembea au kuendesha baiskeli kwa siku nzima?	Saa :dakika 

Kazi za burudani

Maswali yanayofuata hayahusishi kazi na shughuli za kiusafiri ambazo tayari umezizungumzia. Sasa hivi ningependa kukuuliza kuhusu shughuli za michezo, urembo na burudani (kujifurahisha),

	Swali	*Jibu*
6-7	Je, huwa unafanya shughuli ngumu za michezo, urembo na burudani *(za kujifurahisha)* zinazosababisha kasi ya upumuaji au mapigo ya moyo kuongezeka kama *[kukimbia au mpira]* angalau kwa daki 10 mfululizo?	*Ndiyo 1* *Hapana 2*  *Kama jibu ni Hapana, nenda 6-10*
6-8	Kwa wiki nzima, ni katika siku zipi wewe hufanya kazi ngumu za michezo, urembo na burudani *(za kujifurahisha)*?	Idadi ya siku 
6-9	Unatumia muda gani kufanya kazi ngumu za michezo, urembo na burudani kwa siku nzima?	Saa :dakika 
6-10	Je, huwa unafanya kazi za kawaida za michezo, urembo au burudani *(za kujifurahisha)* ambazo zinasababisha ongezeko dogo la kasi ya kupumua au	*Ndiyo 1* *Hapana 2*  *Kama jibu ni Hapana, nenda 6-13.*

	mapigo ya moyo kama vile kutembea kwa kasi, *[kuendesha baiskeli, kuogelea, na mpira wa wavu]* angalau kwa dakika 10 mfululizo?	
6-11	Kwa wiki nzima, ni siku ngapi wewe hufanya kazi za kawaida za michezo, urembo au kuburudisha *(za kujifurahisha)*?	Idadi ya siku ☐
6-12	Hutumia muda gani kufanya shughuli za kawaida za michezo, urembo au kuburudisha *(za kujifurahisha)* kwa siku?	Saa :dakika ☐☐

KUPANUA HOJA: MAZOEZI

Tabia ya kukaakaa

Swali lifuatalo linahusu kukaa au kupumzika kazini, nyumbani, kwenda na kurudi sehemu mbalimbali, au ukiwa na marafiki ikiwamo muda unaotumia kukaa katika dawati, kukaa na marafiki, kusafiri kwenye gari, basi, treni, kusoma, kucheza karata au kutazama televisheni, lakini usihusishe muda unaotumia kulala.

6-13	Je, ni muda gani hutumia kukaa au kupumzika kwa siku nzima?	Saa :dakika ☐☐

SEHEMU C.

MAELEKEZO: hapa chini kuna maelezo yanayohusiana na dhana mbalimbali kuhusu kufanya mazoezi. Tafadhali onyesha kiwango cha kukubali au kutokubali maelezo hayo kwa kuzungushia KK kwenye ninakubali kabisa, K kwenye ninakubali, S kwenye sikubali au SK kwenye sikubali kabisa.

7	**MAELEZO**	**Ninakubali Kabisa**.	**Ninakubali**	**Sikubali**	**Sikubali Kabisa**
7-1	Mazoezi hunichukulia muda wangu mwingi sana.	KK	K	S	SK
7-2	Mazoezi hunichosha.	SA	K	S	SD
7-3	Maeneo ya kufanyia mazoezi yako mbali sana na mimi.	KK	K	S	SK
7-4	Huwa ninajisikia aibu sana kufanya mazoezi.	KK	K	S	SK
7-5	Inagharimu fedha nyingi sana kufanya mazoezi.	KK	K	S	SK
7-6	Vifaa vya mazoezi haviwiani na ratiba yangu.	KK	K	S	SK
7-7	Ninachoka sana nikifanya mazoezi.	KK	K	S	SK
7-8	Mwenzi wangu (au mtu mwingine wa muhimu) hapendelei suala la kufanya mazoezi.	KK	K	S	SK
7-9	Mazoezi huchukua muda mwingi sana wa mahusiano yangu kifamilia	KK	K	S	SK
7-10	Ninafikiri watu wanaofanya mazoezi huvaa mavazi ya ajabu ajabu.	KK	K	S	SK
7-11	Watu wa nyumbani kwangu hawanihamasishi kufanya mazoezi.	KK	K	S	SK
7-12	Mazoezi huchukua muda mwingi sana wa majukumu yangu katika familia.	KK	K	S	SK
7-13	Mazoezi ni kazi ngumu sana kwangu.	KK	K	S	SK
7-14	Kuna sehemu chache sana za kufanyia mazoezi.	KK	K	S	SK

SEHEMU D.

Hapa chini kuna baadhi ya mambo yanayohusu mazoezi ya viungo ambayo unaweza kujadiliana na mgonjwa. Tafadhali jibu ama NDIYO au HAPANA kwa kuweka alama ya vema (√).

8	**MASWALI**	**NDIYO**	**HAPANA**
8-1	Je, huwa unajadili mada ya mazoezi ya viungo na wagonjwa wako?		
	Kama (8-1) hapo juu ni HAPANA, toa sababu:- Sina muda wa kutosha ☐ Siamini kuwa ina manufaa yoyote ☐ Sina elimu wala uzoefu wa kutosha ☐ Sio eneo langu la utaalam ☐		
8-2	Je, huwa unawashauri wagonjwa wako kuchangamsha miili yao.		
8-3	Je, huwa unajadili na wagonjwa wako faida za kufanya mazoezi ya viungo?		
8-4	Je, huwa unajadili na wagonjwa wako kuhusu uzoefu wao wa nyuma katika kuganya mazoezi ya viungo?		
8-5	Je, huwa unajadili na wagonjwa vikwazo wanavyoweza kukumbana navyo au matatizo wanayoweza kupata kutokana na jitihada zao za kufanya mazoezi?		
8-6	Je, huwa unawaeleza wagonjwa wango juu ya MARA NGAPI wafanye mazoezi?		
8-7	Je, huwa unawaeleza wagonjwa wako KIWANGO CHA MUDA wa mazoezi?		
8-8	Je, huwa unawaeleza wagonjwa wango juu ya KASI wanayopaswa kuwa nayo wanapofanya mazoezi?		
8-9	Je, huwa unawaeleza wagonjwa wako kuhusu AINA ya mazoezi wanayopswa kufanya?		
8-10	Je, wewe na mgonjwa wako mna ratiba ya maandishi mliyojiwekea ya kufanya mazoezi?		
8-11	Je, huwa unatoa kitu chochote cha maandishi kuhusu mazoezi ya viungo au kuhusu kufanya mazoezi kila siku ya kliniki?		
8-12	Huwa unawaeleza wagonjwa kwamba una mpango wa kuzungumza nao kuhusu mazoezi ya viungo hapo baadae wakija?		

Umefikia mwisho wa dodoso hili na tunashukuru sana kwa ushiriki wako.

APPENDIX E

UNIVERSITY OF THE WESTERN CAPE

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

FOMU YA UKUBALI

Mada ya Utafiti:

Utafiti huu umeelezwa kwangu kwa lugha ninayoielewa na kwa hiari yangu mwenyewe ninakubali kushiriki. Maswali yangu kuhusu utafiti huu yamejibiwa. Ninatambua kwamba taarifa zozote zinazonihusu mimi zitatunzwa kwa siri na kwamba ninaweza kuacha uendelea kushiriki bila kulazimika kutoa sababu yoyote na haitaniathiri mimi kwa namna yoyote ile.

Jina la Mshiriki……..

Sahihi ya Mshiriki……

Tarehe……

Ikiwa una maswali yoyote kuhusiana na utafiti huu na haki zako za ushiriki katika utafiti huu au kama unataka kuripoti tatizo lolote ulilokumbana nalo kuhusiana na utafiti, tafadhali wasiliana na mratibu wa utafiti:

Prof. J Phillips.

Chuo Kikuu cha Western Cape

Private Bag X17, Belville 7535

Simu ya Mezani: (021)959-2542

Simu ya mkononi:

Faksi: (021)959-1217

B-pepe: jphillips@uwc.ac.za

Certified as a true translation of the English version.

WAFASIRI

TANZANIA TRANSLATORS ASSOCIATION (WAFASIRI)

APPENDIX F

KARATASI YA MAELEZO

Mada ya Utafiti: Viwango vya mazoezi ya viungo vya madaktari pamoja na ushauri wao katika juhudi za kupunguza magonjwa sugu yanayotokana na mtindo wa maisha ya watu nchini Tanzania.

Je, utafiti huu unahusu nini?

Huu ni utafiti unaofanywa na **Wallace M. Karuguti**, mwanafunzi wa uzamili katika Chuo Kikuu cha Western Cape. Tunakuomba ushiriki katika utafiti huu kwa sababu wewe kwa wadhifa wako ni Daktari unayefanya kazi ama Hospitali ya Taifa ya Muhimbili au Taasisi ya Mifupa Muhimbili (MOI) na maelezo utakayotoa ni ya muhimu sana katika utafiti huu. Lengo la utafiti huu ni kuchunguza uhusiano uliopo kati ya viwango vya mazoezi ya viungo na ushauri unaotolewa na madaktari katika kuzuia magonjwa sugu yanayotokana na mtindo wa maisha.

Nitaulizwa maswali gani iwapo nitakubali kushiriki katika utafiti huu?

Utaombwa kujaza dodoso la utafiti ambalo litakuwa na sehemu nne (A, B, C na D). Zoezi hili litachukua muda usozidi dakika 15-20 tu katika kujibu maswali yaliyopo katika sehemu zote nne. Dodoso za utafiti zitaletwa kazini kwako na kukusanywa tena hapo hapo kazini.

Je, ushiriki wangu katika utafiti huu utatunzwa kwa siri?

Tutafanya kila liwezekanalo kutunza taarifa zako kwa siri. Ili kusaidia kudumisha usiri wa taarifa zako, dodoso letu halitakutaka kuandika jina lako wala hatutahitaji taarifa zozote zinazokutambulisha wewe binafsi.

Kama tutaandika ripoti au makala yoyote kutokana na utafiti huu, taarifa zinazokutambulisha zitalindwa kwa usiri wa kiwango cha juu.

Kulingana na matakwa ya kisheria na/ au viwango vya weledi, tutatoa taarifa kwa watu husika na/ au mamlaka husika kuhusu taarifa zozote zitakazotufikia kuhusiana na

unyanyasaji wa watoto au dharau au madhara yoyote yatakayokupata wewe au wengine.

Madhara ya kushiriki katika utafiti huu ni nini?

Hakuna madhara yanayoweza kutokea kutokana na kushiriki katika utafiti huu.

Je, nini faida za utafiti huu?

Faida kwa upande wako ni kukutia moyo kwamba mazoezi ya viungo ni muhimu kwa afya ya mwili si tu kwa wagonjwa unaowatibu bali pia kwako mwenyewe.

Matokeo ya utafiti huu pia yatamsaidia mtafiti kujifunza zaidi kuhusu uhusiano uliopo kati ya viwango vya mazoezi ya viungo na ushauri unaotolewana na madaktari katika jitihada za kuzuia magonjwa sugu yanayotokana na mtindo wa maisha. Taarifa zitakazokusanywa zitasaidia katika kuboresha uamuzi wa madakatari kuingiza maelezo ya ushauri kuhusu kufanya mazoezi ya viungo katika karatasi za maelezo ya wagonjwa wao. Tunatumaini kwamba, katika siku za baadae, watu wengine watanufaika na utafiti huu kwa kuongeza uelewa juu ya umuhimu wa mazoezi ya viungo kama kiashiria cha ushauri unaotolewa na madakatari kwa wagonjwa kuhusu mazoezi ya viungo.

Je, ninaweza kushiriki katika utafiti huu na nikaamua kuacha muda wowote?

Ushiriki wako katika utafiti huu ni wa hiari kwa asilimia zote. Unaweza kuamua kutoshiriki kabisa. Kama utaamua kushiriki katika utafiti huu, unaweza pia kuamua kuacha wakati wowote. Kama utaamua kutoshiriki katika utafiti huu au kama utaacha kuendelea kushiriki kwenye utafiti hautapata adhabu yoyote au kupoteza maslahi yako yoyote yanayokuhusu.

Inakuwaje kama nina maswali?

Utafiti huu unafanywa na ***Wallace M. Karuguti*** *mwanafunzi wa uzamili wa mahiri wa Mifupa katika Chuo Kikuu cha* Western Cape. Kama una swali lolote kuhusu utafiti wenyewe, tafadhali wasiliana na:-

Bw. Wallace M. Karuguti.
Taasisi ya Mifupa Muhimbili (MOI)

S. L. P. 65474,
Dar es Salaam
Tanzania.
Simu ya mkononi +255753016019 au +27799751600
B-pepe wallacem80@yahoo.co.uk

Ikiwa una maswali yoyote kuhusiana na utafiti huu na haki zako kwenye ushiriki katika utafiti huu au kama unataka kuripoti tatizo lolote ulilokumbana nalo kkuhusiana na utafiti, tafadhali wasiliana na:

Mkuu wa Idara: Prof. J Phillips
Mkuu wa Kitivo cha Sayansi za Afya na Jamii: Prof. R. Mpofu.
Chuo Kikuu cha Western Cape
Private Bag X17
Bellville 7535.

Utafiti huu umeishinishwa na Kamati za Seneti, Kamati ya Utafiti na Kamati ya Maadili, za Chuo Kikuu cha Western Cape.

APPENDIX G

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

HIGHER DEGREES COMMITTEE

25th November 2009

TO WHOM IT MAY CONCERN

Dear Sir/Madam

Research Project of Wallace Karuguti (Student Number: 2968893)

This letter confirms that Mr. Karuguti is a registered student in the Faculty of Community and Health Sciences at the University of the Western Cape.

His research proposal entitled ***"Physicians Physical Activity Patterns and their Advice about Chronic Disease of Lifestyle Risk Reduction In Tanzania"*** submitted in fulfilment of the requirements for Masters in Physiotherapy has been examined by the Higher Degrees Committee and found to be of high scientific value, methodologically sound and ethical.

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

Sincerely

DR GAVIN REAGON
Chairperson: Higher Degrees Committee

APPENDIX H

UNIVERSITY of the
WESTERN CAPE

Private Bag X17, Bellville 7535, South Africa
Tel.: +27 (0) 21 959 2542/3647.
Fax: +27 (0) 959 1217
Email: jphillips@uwc.ac.za
Website: www.uwc.ac.za

DEPARTMENT OF PHYSIOTHERAPY

The Permanent Secretary
Ministry of health
P.O. Box 9083
Dar es Salaam,
Tanzania
Dear Sir/Madam,

Re: Request for permission to collect data for my research at Muhimbili National Hospital and Muhimbili Orthopedic Institute.

Kindly refer to the heading above. I am currently pursuing a Masters degree in Physiotherapy at the University of the Western Cape in South Africa. I am required by the University to conduct a research study as a partial fulfillment of the Masters Degree program in Physiotherapy. The proposed title of my thesis is **"Physician's physical activity patterns and their advice about chronic diseases of lifestyle risk reduction in Tanzania".**

I am requesting permission to collect the necessary information as per my study among the doctors practicing at Muhimbili National Hospital (MNH) and Muhimbili Orthopedic Institute (MOI) to assist in the completion of my study. The participant's information letter that will be given to every participant indicates that the participation to the study will be anonymous, voluntary and that issues of confidentiality and respect will be highly maintained. Informed consent will be obtained from the participants and the gathered information will only be used for research purposes. The results of this study will be made available to the Ministry of Health as well as the specific institution/hospital.

Please find herewith attached a copy of my proposal and a letter of ethical clearance from the University of the Western Cape.

Yours Faithfully
……
Wallace M. Karuguti
(Student number 2968893)
UWC Physiotherapy student.

……..
Prof J Phillips.
Supervisor.

APPENDIX I

UNIVERSITY of the
WESTERN CAPE

Private Bag X17, Bellville 7535, South Africa
Tel.: +27 (0) 21 959 2542/3647
Fax: +27 (0) 959 1217
Email: jphillips@uwc.ac.za
Website: www.uwc.ac.za

DEPARTMENT OF PHYSIOTHERAPY

The Executive Director.
Muhimbili National Hospital,
P.O. Box 65000, Dar-es-Salaam.
Tanzania.

Dear Sir/Madam,

Re: REQUEST FOR PERMISSION TO UNDERTAKE A STUDY AT YOUR HOSPITAL/INSTITUTION.

Kindly refer to the heading above. I am currently pursuing a Masters degree in Physiotherapy at the University of the Western Cape in South Africa. I am required by the University to conduct a research study as a partial fulfillment of the Masters Degree program in Physiotherapy. The proposed title of my thesis is **"Physicians physical activity patterns and their advice about chronic diseases of lifestyle risk reduction in Tanzania".**

Allow me to collect the necessary information as per my study among the doctors practicing in your hospital/institute and to use this information for completion of my study. The participant's information letter that will be given to every participant indicates that the participation to the study will be anonymous, voluntary and that issues of confidentiality and respect will be highly maintained. Informed consent will be obtained from the participant and the gathered information will only be used for the research purposes. The results of this study will be made available to the Ministry of Health as well as your institution/hospital.

Please find herewith attached a copy of my proposal and a letter of ethical clearance from the University of the Western Cape.

Yours Faithfully
.....

Wallace M. Karuguti
(Student number 2968893)
UWC Physiotherapy student.

.....

Prof J Phillips.
Supervisor.

APPENDIX J

UNIVERSITY of the
WESTERN CAPE

Private Bag X17, Bellville 7535, South Africa
Tel.: +27 (0) 21 959 2542/3647.
Fax: +27 (0) 959 1217
Email: jphillips@uwc.ac.za
Website: www.uwc.ac.za

DEPARTMENT OF PHYSIOTHERAPY

The executive Director.
Muhimbili Orthopedic Institute,
P.O. Box 45474, Dar-es-Salaam.
Tanzania.

Dear Sir/Madam,

Re: REQUEST FOR PERMISSION TO UNDERTAKE A STUDY AT YOUR HOSPITAL/INSTITUTION.

Kindly refer to the heading above. I am currently pursuing a Masters degree in Physiotherapy at the University of the Western Cape in South Africa. I am required by the University to conduct a research study as a partial fulfillment of the Masters Degree program in Physiotherapy. The proposed title of my thesis is **"Physicians physical activity patterns and their advice about chronic diseases of lifestyle risk reduction in Tanzania".**

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Please find herewith attached a copy of my proposal and a letter of ethical clearance from the University of the Western Cape.

Yours Faithfully

.....

Wallace M. Karuguti
(Student number 2968893)
UWC Physiotherapy student.

.....

Prof J Phillips.
Supervisor.

APPENDIX K

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF HEALTH AND SOCIAL WELFARE

Telegrams: "AFYA", DAR ES SALAAM
Telephone: 2120261/2121019
(All letters should be addressed to the Permanent Secretary)

In reply please quote:

P.O. Box 9083,
DAR ES SALAAM

Ref. No. AB. 209/456/01A

21st December 2009

Wallace M. Karuguti,
Student No. 2968893,
Department of Physiotherapy,
University of the Western Cape
Private Bag x 17, Bellville 7535,
SOUTH AFRICA

RE: YOUR REQUEST FOR PERMISSION TO COLLECT DATA FOR YOUR RESEARCH AT MUHIMBILI NATIONAL HOSPITAL AND MUHIMBILI ORTHOPAEDIC INSTITUTE.

I am pleased to inform you that, clearance has been granted for your research entitled **"Physicians Physical Activity Patterns and their Advice about Chronic Disease of Lifestyle Risk Reduction in Tanzania"** for your Masters in Physiotherapy at the University of the Western Cape in the Republic of South Africa. The study is to be conducted at Muhimbili National Hospital and Muhimbili Orthopaedic Institute.

Wishing you success in your study and hope to receive copy of your result.

Dr. Gilbert R. Mliga
For PERMANENT SECRETARY

APPENDIX L

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF HEALTH AND SOCIAL WELFARE

Telegrams: "AFYA", DAR ES SALAAM
Telephone: 2120261/2121019
(All letters should be addressed to
the Permanent Secretary)

In reply please quote:

P.O. Box 9083,
DAR ES SALAAM

Ref. No. AB. 209/456/01A

21st December 2009

Wallace M. Karuguti,
Student No. 2968893,
Department of Physiotherapy,
University of the Western Cape
Private Bag x 17, Bellville 7535,
SOUTH AFRICA

RE: YOUR REQUEST FOR PERMISSION TO COLLECT DATA FOR YOUR RESEARCH AT MUHIMBILI NATIONAL HOSPITAL AND MUHIMBILI ORTHOPAEDIC INSTITUTE.

I am pleased to inform you that, clearance has been granted for your research entitled **"Physicians Physical Activity Patterns and their Advice about Chronic Disease of Lifestyle Risk Reduction in Tanzania"** for your Masters in Physiotherapy at the University of the Western Cape in the Republic of South Africa. The study is to be conducted at Muhimbili National Hospital and Muhimbili Orthopaedic Institute.

Wishing you success in your study and hope to receive copy of your result.

Dr. Gilbert R. Mliga
For PERMANENT SECRETARY

APPENDIX M

MUHIMBILI ORTHOPAEDIC INSTITUTE

P.O. Box 65474; DAR ES SALAAM, TANZANIA, MUHIMBILI COMPLEX
Executive Director: +255-022-2153359
General lines: +255-022-2151298/2152937/2152938
FAX: +255-022-2151744
E-Mail: info@moi.ac.tz
Website: www.moi.ac.tz
OFFERING SERVICES IN ORTHOPAEDICS, NEUROSURGERY AND TRAUMATOLOGY

MOI/ PF.0412/31 **14th January 2010.**

Wallace M. Karuguti
MOI.
P.O BOX 65474
Dar es Salaam.

REF: REQUEST FOR PERMISSION TO UNDERTAKE RESEARCH AT MOI.

Reference is made to your latter dated 25th November 2009 with the above heading.

I am pleased to inform you that, your request to do research at MOI has been approved. Therefore very kindly you can start your research as you have requested.

With regards,

.....
Hellen J. Makali.
For: Executive Director.

MUHIMBILI ORTHOPAEDIC INSTITUTE
P. O. Box 65474
DAR ES SALAAM