

THE ROLE OF PHYSIOTHERAPY IN THE MANAGEMENT OF PATIENTS  
FOLLOWING CARDIAC SURGERY IN TANZANIA

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Department of Physiotherapy



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The logo of the University of the Western Cape, featuring a classical building facade with columns and a pediment, rendered in a light blue color.

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## **ABSTRACT**

An increase of cardiac surgeries globally has been associated with an increasing number of people with cardiovascular disease in both developed and developing countries. Following cardiac surgery, pulmonary complications are an important cause of morbidity leading to significant prolonged hospitalisation, mortality and overall hospital costs. Physiotherapists have been part of cardiac multidisciplinary team playing a role in prevention and managing respiratory complications post-operatively. Numbers of studies have investigated on the efficacy of physiotherapy interventions in managing patients following cardiac surgery. However, there is no consensus in the literature with regards to intensity, duration of the session and content of therapy in this specialised area of cardio-pulmonary. These variations of physiotherapy intervention have made difficult to find agreement on the necessity of physiotherapy care in the post-operative management of patients following cardiac surgery. To date, however, there have been limited or no studies done on the role of physiotherapy in the Cardiac Unit setting. Thus, the aim of the study was to investigate the role of physiotherapy in the post-operative management of patients following cardiac surgery at Muhimbili National Hospital (MNH), Tanzania. An explanatory sequential mixed method study design was used. A descriptive retrospective study design was chosen for the quantitative phase using a convenient sample of all 105 patients' records operated from January 2010 to 31<sup>st</sup> December 2013. With regards to the qualitative phase, 2 Cardiac Surgeons and 10 Physiotherapists working at MNH were conveniently sampled to explore their perceptions on the post-operative role of physiotherapy in the management of patients following cardiac surgery at MNH. Ethical clearance was obtained from the University of the Western Cape and Muhimbili National Hospital to conduct the study. Anonymity and confidentiality was ensured for all participants and their participation was voluntary. They were allowed to withdraw from the study anytime without any negative consequences.

Following ethical issues; quantitative data (i.e. profile and process of care of patients) was collected by means of a data extraction sheet while the two separate semi-structured interview guides were used for qualitative data. A total of 105 patients' records were obtained. Quantitative data was analysed using SPSS 22.0 version. A descriptive statistics was used. The mean age of the study sample was 30.6 (SD=10.5). More than half (54.3%) were females and males 45.7% of the sample. The results show that Rheumatic Heart Disease (RHD) accounted for the majority (74.3%) of cardiac diseases. Double valve repair accounted for 71.4%. A decline in the number of surgeries performed were noted from 2010 (48.6%) to 2013 (10.5%). The mean number of days spent in Intensive Care Unit (ICU) were 6.4 (SD=5.3) and in the ward 12.2 (SD=7.8). A total of 21.4% of the sample developed post-operative complications and 10.5% of the total sample died. A substantial number of patients (77.7%) were referred for physiotherapy treatment post-operatively, with most of these referrals (70.0%) on the first day post-operatively. The majority (37.8%) of the patients received 3 physiotherapy sessions in the ICU with most of these patients (79.3%) being seen once a day in the ICU and (65.8%) in the ward. Physiotherapists prescribed (53.7%) a combination of breathing exercises, active limb mobilisation, incentive spirometry and progressive ambulation in the ICU. A combination of breathing exercises, active limb mobilisations, endurance training and posture correction was frequently (89.5%) prescribed in the ward. Content analysis was used to analyse qualitative data. Cardiac Surgeons were aware of the role of Physiotherapists on the post-operative management of patients following cardiac surgery. They also identified shortcomings on the side of Physiotherapists' in terms of poor co-operation, inadequate skills and a lack of motivation to work in the Cardiac Unit. On the other hand, Physiotherapists revealed that there was communication breakdown between them and Cardiac Surgeons. They added that they were not motivated to work in the Cardiac Unit due to their inadequate skills in the area of investigation, training and lack of

working facilities. Although they had consensus on different techniques, they had variations on the application procedure, intensity and frequency. Cardiac Surgeons and Physiotherapists agreed that hospital management should motivate Physiotherapists by opening a Physiotherapy Unit within the Cardiac Complex and train Physiotherapists in the area of cardio-pulmonary. From these findings it can be concluded that, poor communication and lack of trained Physiotherapists in the field of cardio-pulmonary is a setback which need to be addressed. Also, lack of standard treatment procedure among Physiotherapists brings variations in this world of evidence based practice.





**DECLARATION**

I hereby declare that **“The role of physiotherapy in the management of patients following cardiac surgery in Tanzania”** is my own work, it has not been submitted, or part of it, for any degree or examination in any other university, and that all resources I have used or quoted have been indicated and acknowledged by complete references.

Abdallah R. Makalla

Signature.....

November 2014

Witness:

.....

Prof J. S. Phillips



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## **DEDICATION**

This work is dedicated to Bertha, my loving mother who gave up so much. Without her efforts I would not be where I am today.

To Nathan Ibrahim, my beloved brother who kept encouraging me to take a step ahead.

To Furaha Abdallah, my lovely daughter who kept praying for me at her young age.

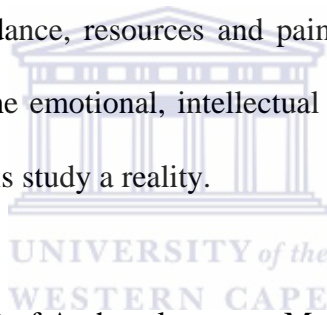


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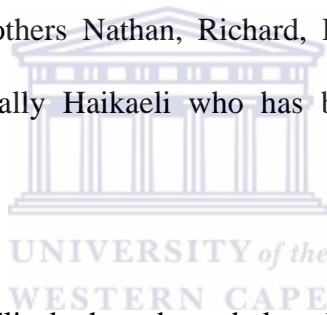
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Many thanks should go to my family, my Mother Bertha who kept encouraging, praying day and night and looking after my family in my absence. You're so special Mum. My Father Mr. Saed Abdallah Makalla, My brothers Nathan, Richard, Rapha, Furaha, My Sisters Nora, Eliza, Salama, Rehema and finally Haikaeli who has been wonderful to me since my childhood until now. Thank you.



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## **KEYWORDS**

Cardiac surgeons

Cardiac surgery

Perceptions

Physiotherapy

Post-operative

Pre-operative

Process of care

Profile



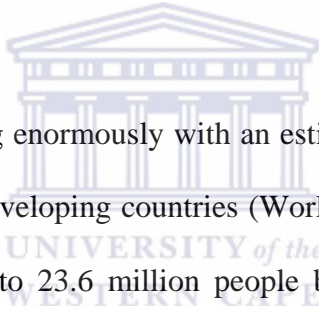
# CHAPTER ONE

## INTRODUCTION

### 1.0 Introduction

This chapter outlines the background and the rationale for the study in relation to cardiac surgery globally and Tanzania. It further outlines the overall aim and specific objectives of the study. The chapter also illuminates the significance of the study, definition of key concepts while concluding with the organisation of the chapters.

### 1.1 Background



Cardiovascular disease is growing enormously with an estimation of 12 million people dying annually, predominantly in the developing countries (World Health Organisation, 2013). The disease is anticipated to kill up to 23.6 million people by 2030 globally if no immediate preventative measures are taken (Smith et al., 2012; Mendis, Puska, & Norrving, 2011). As a global public health agenda, cardiovascular disease accounts for about half of all non-communicable diseases (Mendis et al., 2011). The alleged causes are increased urbanisation, increased longevity lifespan and lifestyles in both industrialised and non-industrialised countries (WHO, 2004). Of the 17.3 million deaths caused by CVDs globally in 2008, coronary heart disease accounted for 7.3 million (WHO Fact sheet, 2013). Moreover, 80% of all deaths were reported to have occurred in middle and low income countries, the majority of which were persons 60 years old and above. As the burden of CVDs increases, coronary heart disease is becoming the leading cause of cardiac surgery globally (Go et al., 2013, Lima, Cavalcante, Rocha, & de Brito, 2011). In recent years, a significant

increase in the number of patients with cardiovascular diseases requiring cardiac surgery has been observed to increase too (Lima et al., 2011).

The Tanzanian president, at a media conference in 2012, stated that the number of deaths caused by cardiovascular complications was alarming and the country's capacity to control the situation was very low (The Guardian, 12/01/ 2012). The President underlined the magnitude of the problem reported to be increasing by 26% annually.

The burden of CVDs has enormous direct and indirect costs with estimation of up to \$ 120.5 billion spent in the United States of America (USA) for medical services, medication, and death services (Go et al., 2013; Mensah & Brown, 2007). In the case of Tanzania, the country has been incurring high costs by sending patients with cardiovascular related complications to India for treatment. In the 2011/12 financial year, the Tanzanian Ministry of Health and Social Welfare (MoHSW) was expected to spend 13 billion shillings for treatment of cardiac patients outside the country (MoHSW, 2012). This accounted for 64.9% of all patients who were referred abroad for treatment in 2011/ 2012, a huge burden on the country's economy. As a result, the government was finalising construction of a complex for cardiac surgery at Muhimbili National Hospital (MNH). The complex was considered as a part of the long-term measures undertaken to build national capacity in taking care of cardiovascular cases in Tanzania (MoHSW, 2012).

Unlike other types of surgery, cardiac surgeries are expensive, demanding well organised facilities equipped with the necessary equipment and qualified experts. The plans to establish a cardiac unit in Tanzania started as early as the 1970s but it was not until 2005 when a more determined commitment by the government led to a team of medical professionals being sent

to train in various institutions abroad (Nyawawa et al., 2010). This specialised cardiac team returned Tanzania in 2007 and with appropriate measures having been taken at Muhimbili National Hospital, open heart surgery began on 21<sup>st</sup> May 2008 and by June 2009 a total of 105 patients had been operated on (Nyawawa et al., 2010). Like other low income countries, Tanzania faces many challenges with the establishment of cardiac unit.

Compared to developed countries like USA and China where congenital heart disease is a leading cause of cardiac surgery (Go et al., 2013; Pezzella, 2010), in Tanzania, rheumatic heart disease, congenital heart disease, and heart valve diseases are dominant conditions leading to cardiac surgery (Nyawawa et al., 2010; Ussiri et al., 2010). According to Marijon et al. (2009), early diagnosis of conditions leading to cardiac surgery and early medical therapy usually results in reducing surgical intervention. However, delayed or wrongful diagnosis in the first place is reported to delay the process of early medical therapy which could reduce chances for cardiac surgery (Pająk & Kozela, 2012). Early diagnosis is a challenge in most developing countries, due to inaccessibility to health care and lack of competent human resources in the field of cardiovascular disease (Marijon et al., 2009). For those who have an opportunity to access hospital services in emerging countries, literature reports that most of the hospitals has a scarcity of appropriate equipment and poor technology, resulting in inappropriate diagnosis (Pająk & Kozela, 2012; Marijon et al., 2009). In most cases, surgical intervention is not considered as a first line choice of treatment, but is considered as a life saving intervention for patients having severe persistent symptoms after medical therapy (Essop & Nkomo, 2005). It is for this reason that cardiac surgery can be considered as a process of restoration and regaining of the vital capabilities consistent with the heart functional capacity of patients who have hitherto had heart disease (Lima et al., 2011).



Cardiac surgeries have evolved over the years; but patients undergoing cardiac surgery are not free from post-operative complications. These complications are related to the factors associated with the clinical and functional conditions of the patient, as well as to the type of surgical procedure (Go et al., 2013). Currently, the most important pre-operative clinical factors which need to be considered prior to cardiac surgery are diabetes mellitus, hypertension, smoking history and dyslipidaemia (Newman et al., 2006; Weissman, 2004). Others are age, re-operation, renal insufficiency, previous pulmonary diseases, neurological disorders, and hyperthyroidism, among others.

The management of cardiac surgery patients calls for a multidisciplinary team approach involving physiotherapists, among others (Berney, Haines, & Denehy, 2012). For many years, physiotherapists have been promoting functional recovery of patients following major surgeries (Reeve, Nicol, Stiller, McPherson, & Denehy, 2008). As members of the multidisciplinary team, physiotherapists join cardiac surgeons, cardiologists, nurses and other team members in reducing post-operative pulmonary complications (Reeve et al., 2008). In addition to that, they also play a vital part in promoting patients' functional recovery in pre-operative and post-operative phases. Early physiotherapy intervention in the process of care has been cognisant to reduce mortality, shorten hospital stay and promote quality of life post-operatively by reducing pulmonary complications (Arcêncio et al., 2008). The Society for Cardiothoracic Surgery (SCTS) in Great Britain and Ireland argue that, involvement of physical activities following cardiac surgery facilitates the quality of life of the patient after hospital discharge and may also have a positive impact within the hospital (SCTS, 2014). As such, success of quality is measured by the improvement of a patient's quality of life post hospital discharge and their ability to go back to their routine daily activities.

In the process of rehabilitation, physiotherapy has a definite role to play in facilitating quick recovery which enables patients to go back to their optimal functioning and productive life despite possible limitations imposed by their disease process (Arcêncio et al., 2008; Renault, Costa-Val, & Rossetti, 2008). Therefore, cardiac rehabilitation in this case can be described as the process of developing and sustaining the optimal level of physical function, social, and psychological activity following cardiac surgery (Lima et al., 2011).

The process involves physical training in a broad spectrum of changes in clinical set up and psycho-social behaviour. During cardiac rehabilitation, numerous interventions by the multidisciplinary team are aimed at modifying the risk factors to the patients as part of preventative measures post-cardiac surgery (Lima et al., 2011). In the post-operative phase the cardiac surgeons, physiotherapists, nutritionists, and occupational therapists, among others, will address the risk factors by educating the patient on smoking cessation, diet, stress management, importance on physical activity and exercises. By addressing the risk factors there is a chance of reducing mortality post-cardiac surgery (Lima et al., 2011).

A one year evaluation study conducted in Tanzania in 2010, found that out of the 105 patients operated on, over four-fifths (86.7%) were successfully discharged from the hospital (Nyawawa et al., 2010). The evaluation study did not, however, report adequately on the post-operative process of care (i.e. referral to physiotherapy, number of physiotherapy sessions and content of therapy) for patients that had undergone cardiac surgery in acute and sub-acute phases. As such, this study will address the gap by identifying the post-operative process of care and explore the perceptions of cardiac surgeons and physiotherapists on the post-operative role of the physiotherapy as an essential team member in this specialised area.

## 1.2 Problem statement

The management of cardio-pulmonary patients requires a multidisciplinary team approach in all phases of pre- and post-operative care. In the process of managing patients, there are numerous complications which may arise, such as pulmonary complications, bad posture and paralysis which could require the intervention of a physiotherapist. However, the position of physiotherapists in the prevention or diminishing of these complications with other cardiac multidisciplinary team members is not well defined, as noted by Moreno et al. (2011). This is could be due to a lack of clarity on the role of physiotherapy in this field of study, which leads to team members questioning the necessity of having physiotherapists in the cardiac team (Stiller, 2000). This ambiguity is also present in Tanzania, as other multidisciplinary team members concur with McAuley (1999) who argue that physiotherapy is only beneficial when offered to the at-risk patients who are prone to develop chest complications. On the other hand, Miranda, Padulla, & Bortolatto, (2011) argue for the necessity of physiotherapy, stressing the fact that it is essential in pre- and post-operative phases of cardiac surgery. While the discussion persists, cardiac surgery continues and patients are prone to develop complications. Physical and pulmonary complications i.e. poor posture, hemiparesis, atelectasis, impaired gaseous exchange and reduced functional residual capacity of the lung are among of the post-operative complications (Masud, Zainab, Ratnani, Perme, & Vykoukal, 2011; Moreno et al., 2011; Newman et al., 2006). For example, the incidence of atelectasis increases following anaesthesia during surgery which leads to pulmonary complication (Hillegass, 2011). In Tanzania, these post-operative complications following cardiac surgery were and are still a cause of a long hospitalisation of up to 50 days (Nyawawa et al., 2010). To grapple with these complications, the literature suggests early and effective post-operative multidisciplinary team intervention involving physiotherapists (Westerdahl & Möller, 2010).

At MNH, the multidisciplinary team involves different health professionals including cardiac surgeons, cardiologists, anaesthesiologists, nurses, perfusionists, physiotherapists and other auxiliary professionals all working together to facilitate patients' recovery following cardiac surgery. However, at MNH various factors, including lack of adequate staffing and skills deficiency, are some of the challenges facing the institution. Since 2008, more than 350 cardiac surgeries have been performed in Tanzania, but there has been no study on the role of physiotherapy in the post-operative phase. As a consequence, health professionals may not be aware of the position and the necessity of post-operative physiotherapy. This is among the reasons why this study is being carried out, that is, to establish the necessity of involving physiotherapy in the management of cardiac surgery patients in the entire process, from surgery to recuperation.



### **1.3 Research question**

What is the role of physiotherapy in the post-operative management of patients following cardiac surgery at Muhimbili National Hospital, Tanzania?

### **1.4 Aims of the study**

To investigate the role of physiotherapy in the post-operative management of patients following cardiac surgery in Muhimbili National Hospital, Tanzania

### **1.5 Objectives**

1.5.1 To determine the profile of the patients admitted for cardiac surgery in Muhimbili National Hospital, Tanzania.

- 1.5.2 To describe the process of care of the patients following cardiac surgery in Muhimbili National Hospital, Tanzania.
- 1.5.3 To explore the perceptions of cardiac surgeons on the post-operative role of physiotherapy in the management of patients following cardiac surgery in Muhimbili National Hospital, Tanzania.
- 1.5.4 To ascertain the perceptions of physiotherapists on their role in the post-operative management of patients following cardiac surgery in Muhimbili National Hospital, Tanzania.

## **1.6 Significance of the study**

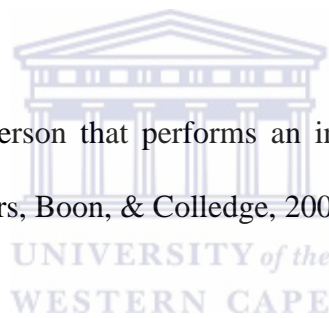
The outcome of this study will add knowledge among health professionals in Tanzania on the role and necessity of physiotherapy in the management of cardiac surgery patients. This will correspondingly enhance teamwork and quality of care of these patients. Physiotherapists will benefit through more informed understanding and appreciation of their post-operative role and thereby lead to improving standards of service delivery. In the same vein the government will use the findings of the study to enhance the role of physiotherapists and develop strategies of reducing identified shortcomings facing cardiac patients. Patients will benefit by receiving physiotherapy services on a specified time which will lead to improvement of their health status. This will aid in reducing post-operative complications, hence improve their chances of recovery. The study will also contribute to the literature on the role and place of physiotherapy in post-operative cardiac surgery rehabilitation in acute and sub-acute phases within the hospital.

## 1.7 Definition of terms

**Cardiac arrest:** “Is the cessation of cardiac mechanical activity as confirmed by the absence of signs of circulation” (Go et al., 2014).

**Cardiac rehabilitation:** “Cardiac rehabilitation (cardiac rehab) is a professionally supervised programme to help people recover from heart attacks, heart surgery and percutaneous coronary intervention (PCI) procedures such as stenting and angioplasty. Cardiac rehabilitation programmes usually provide education and counselling services to help heart patients increase physical fitness, reduce cardiac symptoms, improve health and reduce the risk of future heart problems, including heart attack.” (American Heart Association, 2014).

**Cardiac Surgeon:** A medical person that performs an incision to the heart to correct the defect (Davidson, Haslett, Chilvers, Boon, & Colledge, 2002).



**Cardiac Surgery:** Refers to the treatment whereby a surgeon opens the heart to make an incision into one or more of the heart chambers aiming to repair or replace the affected region (Davidson et al., 2002).

**Cardiologist:** “Is a physician certified to treat problems of the cardiovascular system such as the heart, arteries, and veins of the body to prevent, diagnose and treat heart disease.” (Sutter Health, 2014).

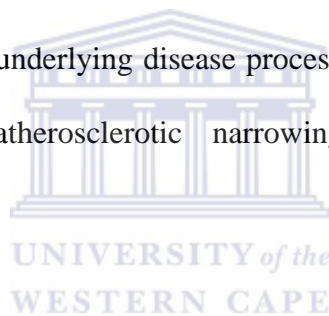
**Cardiothoracic surgery:** “Is a surgical specialty, which deals with the diagnosis and management of surgical conditions of the heart, lungs and oesophagus. It is a testing,

technical specialty which combines a need for understanding of cardiovascular and respiratory anatomy and physiology, cardiac and thoracic pathology and a need to be technically able.” (National Health Service, 2014).

**Cardiovascular disease:** “An all-encompassing term used to describe all diseases and conditions involving the heart and blood vessels” (Mendis et al., 2011).

**Congenital heart disease:** It is a malformation of heart structures present at birth (Mendis et al., 2011).

**Coronary heart disease:** Is the underlying disease process in the blood vessels of the heart disease resulting from the atherosclerotic narrowing of coronary artery disease (Mendis et al., 2011).



**Multidisciplinary team approach:** “Refers to activities that involve the efforts of individuals from a number of disciplines. These efforts are disciplinary-orientated and, although they may impinge upon clients or activities dealt with by other disciplines; they approach them primarily through each discipline relating to its own activities” (Melvin, 1980).

**Physiotherapy:** “Is a health care profession concerned with identifying and maximising quality of life and movement potential within the spheres of health promotion, prevention, treatment interventions, habilitation, and rehabilitation to facilitate physical, psychological, emotional, and social wellbeing of an individual or population” (World Confederation of Physical Therapy, 2013).

**Rheumatic heart disease:** “Is caused by damage to the heart muscle and heart valves from rheumatic fever, following a streptococcal pharyngitis/tonsillitis” (Mendis et al., 2011).

**Role of the physiotherapist:** Is to assess the physical needs of the patient and the cardiovascular fitness in order to plan for cost effective programmes (New Zealand guideline on cardiac rehabilitation group, 2002) thus prevent chest infections, encourage early mobilisation, and provide education and rehabilitation (Inwood, 2002).

**Spirometer:** Instrument used to measure breathing (or lung volumes) (Brooks-Brunn, 1998).





## **1.8 Abbreviations used in the thesis**

**AHA:** American Heart Association

**ASD:** Atrial Septal Defect

**AVR:** Aortic Valve Regurgitation

**AVS:** Aortic Valve Stenosis

**CAD:** Coronary Artery Disease

**CHD:** Congenital Heart Disease

**CVD:** Cardio Vascular Disease

**MNH:** Muhimbili National Hospital.

**MoHSW:** Ministry of Health and Social Welfare

**MVR:** Mitral Valve Regurgitation

**MVS:** Mitral Valve Stenosis

**PDA:** Patent Ductus Arteriosus

**SPSS:** Statistical Packages for Social Sciences

**TVR:** Tricuspid Valve Regurgitation

**USA:** United States of America

**VSD:** Ventricular Septal Defect

**WHO:** World Health Organisation



## **1.9. Outline of the thesis**

Chapter One describes the background of the study explaining the state and magnitude of the cardiovascular disease and cardiac surgery globally and with reference to Tanzania. The problem statement, research question, aim of the study, specific objectives and significance of the study are presented. Finally the chapter provides the outline of the thesis.

Chapter Two reviews literature which pertains to the overview of the burden of cardiovascular disease and resultant of its management. The role of physiotherapy in the pre- and post-operative management related to cardiac surgery and perceptions on the role of physiotherapy is presented. The chapter also highlights the conceptual framework used in this study as well as the summary of the chapter.

Chapter Three describes the methodological approach used in this study. The chapter outlines the research setting, study design, methods of data collection for both quantitative and qualitative data, data analysis, and ethical considerations.

In the Chapter Four, the quantitative results are presented including the socio-demographics of the study sample, and characteristics of variables relating to cardiac surgery as well as physiotherapy care are also presented.

Chapter Five presents the qualitative results on the perceptions of cardiac surgeons with regard to the post-operative role of physiotherapy in the management of patients following cardiac surgery.

Chapter Six describes the qualitative perceptions of interviewed physiotherapists regarding post-operative physiotherapy in the management of patients following cardiac surgery.

Chapter Seven provides the discussion of the results of both quantitative and qualitative aspects. The chapter further incorporates other literature identifying the similarities and differences while identifying the gaps for future studies.

Chapter Eight provides the summary, conclusion and recommendations based on the findings of the study.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter provides an overview of the literature with regards to the burden of cardiovascular disease; the resultant cardiac surgery and the physiotherapy care that follows. The addition in the literature regarding the role of physiotherapy in the post-operative management is reviewed. The chapter ends with the conceptual model of team work effectiveness.

#### 2.2 The burden of cardiovascular disease

Cardiovascular disease (CVD) is a global public health problem responsible for almost half non-communicable diseases (Mendis et al., 2011). The World Health Organisation (2013) states that cardiovascular disease is the number one cause of death in the world, and that the majority of people die annually from cardiovascular diseases (CVDs) than from any other cause. Over 80% of cardiovascular diseases occur in low and middle income countries and occur almost equally in men and women (WHO, 2013). In Europe, CVDs are the primary cause of death, i.e. responsible for 47% (4.3 million) of all deaths occurring in a year (Rayner, Allender, & Scarborough, 2009).

In Africa, cardiovascular disease account for 9.2% of total deaths occurring in the continent annually (Mocumbi, 2012). The reported hospital mortality from cardiovascular disease is high, reaching 9.2% in Cameroon and 21.9% in Tanzania (Mocumbi, 2012). The author notes that cardiovascular diseases have been neglected in Sub-Saharan Africa, although there are

some efforts in trying to gather information on their clinical characterisation, epidemiology, and outcomes. The study points out that owing to the specific pattern of the phenomenon in this region of Africa, research into the determinants of cardiovascular diseases has to go beyond the conventional risk factors and attempt at understanding the role of local practices and cultural habits in determining the incidence of conditions that are particularly common in this region of the world. In East Africa, specifically Kenya, cardiovascular disease is responsible for 12 % of all deaths (Bloom et al., 2011). In Tanzania, there is a rapid increase rate of CVD by 26% annually (MOHSW, 2012).

According to Mendis et al. (2011), the majority of people in low and middle income countries with a high risk of cardiovascular disease remain undiagnosed and those who are diagnosed have insufficient access to health services. Moreover, late diagnosis is made when people are already symptomatic and are admitted to hospital with stroke or acute myocardial infarction. In this late stage of diagnosis, patients require costly and high-technology health-care interventions for treatment. These costly health-care interventions include Coronary Artery Bypass Graft (CABG), and other types of cardiac surgeries (Mendis et al., 2011).

The World Heart Federation (2012) reports that cardiovascular disease is responsible for 18% of the disability-adjusted life years (DALYs) lost in high-income countries while 10% DALYs is lost in low and middle income countries. In South Africa, there are approximately 10% of healthy life-years lost, due to CVD (Becker, 2011). The burden of CVD affects the economy of an individual, families and societies due to loss of productivity and incomes of the person who has CVD (Gaziano, 2007). In other cases, both the individual and their caregiver may have to stop working in order to provide care for them. This economic burden

is worsened in the developing countries where CVD affects a number of working-age group (Gaziano, 2007).

### **2.3 Surgical procedures**

Cardiovascular and circulatory diseases were the leading diseases (11.8%), in the Global Burden of Disease 2010 study; the majority of these conditions are amenable to surgical intervention (World Surgical Association, 2011). As a consequence, the role of surgery in the global health agenda has reached eminence in recent years.

Weiser et al. (2008) reported that 234 million major cardiac surgery procedures are performed globally per annum. Almost 73.6% of these cardiac surgeries were performed in developed countries which consists 30.0% of the world's population. This indicates that 70.0% of the world population living in low and middle income countries do not have access to this service. In the USA, more than 1700 cardiac surgeries per million people are performed as opposed to 25 cardiac surgeries per million people in Asia. India has approximately 42 cardiac surgeries performed per million people annually (Airan, 2005; Padmavati, 2004). China has seen a significant increase in the number of cardiac surgeries performed in the last decade from 200 to 43,000 in one centre per year (Pezzella, 2010). Countries like Brazil, which is among developing countries, perform about 70,000 cardiovascular procedures annually and almost 20,000 pacemaker implantations (Stolf, 2007). With assistance of visiting cardiac surgeons in 2011; seven cardiac procedures were performed in Zambia (Musuku et al., 2013), while Nigeria, reported 51 cardiac surgeries performed for a period of eight years at the Lagos University Teaching Hospital (Falase et al., 2013). However, in Tanzania, 105 procedures were reported since May 2008 to December 2009 (Nyawawa et al., 2010).

According to Padmavati (2004), approximately 60.0% of the cardiac surgeries performed in India are due to coronary artery disease. The second most predominant procedure in India is due to heart valve diseases predominantly rheumatic valve disease. Also, more than 5000 congenital heart defect surgeries are performed in India with about 20,000 children who are born every year with some form of cardiothoracic defects (Airan, 2005). South Africa which is among few African countries with advanced cardiothoracic surgical procedures; the diseases which are frequently operated on include rheumatic valvular disease, coronary artery disease, pericardial effusion, cardiac arrhythmia and congenital heart disease amongst others (Sliwa et al., 2008). Heart transplantation, pacemakers, implantable defibrillators, and cardiac catheterisation are frequently performed in countries with advanced technologies (Go et al., 2013; Rayner et al., 2009).

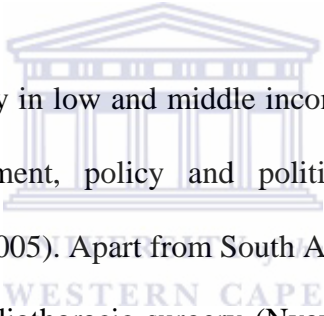


However, there has been a variation of cardiac surgery data widely. Nichols et al. (2012) reported that there is a wide variation of the cardiac surgery data across Europe due to the fact that some countries in Europe do not include private hospitals, while others do. Likewise in China, variations exist (Pezzella, 2010)

According Mendis et al. (2011), rheumatic fever is a common reason for heart disease in children and adolescents, predominantly in developing countries. The disease is an infection of the tonsillopharynx caused by group A streptococcal primarily affecting the heart of an individual, joints and central nervous system if untreated. The untreated rheumatic fever causes fibrosis of the heart valves leading to crippling haemodynamic of valvular heart disease, heart failure and death (Mendis et al., 2011). Literature indicates that surgical intervention is often essential to repair or replace fibrous heart valves in patients with severely damaged valves (Ussiri et al., 2010). Early management of acute rheumatic fever is

encouraged due to the cost of cardiac surgery, which is very high, and almost inaccessible for people living in poor socio-economic conditions (Mendis et al., 2011).

According to Stolf (2007), congenital heart disease accounts for 13% of all cardiothoracic procedures in Brazil annually. In Lagos-Nigeria, there were 131 out of 8377 adults with congenital heart surgeries performed in ten years (Olusegun-Joseph et al., 2011). Likewise, Tanzania reported 35.2% of all patients operated in one year had congenital heart defects (Nyawawa et al., 2010). This is due to the fact that many congenital heart defects are amenable to surgery that can be life-saving and so improve long-term prognosis (Mendis et al., 2011).

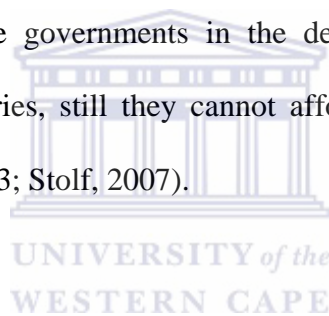


Conducting cardiothoracic surgery in low and middle income countries is a challenge due to lack of technological advancement, policy and political shortcomings and financial constraints (Stolf, 2007; Ghosh, 2005). Apart from South Africa and Egypt, which have made good progress in the area of cardiothoracic surgery (Nyawawa et al., 2010). Nigeria faced quite a number of challenges such as poor working environment and financial constraints (Falase et al., 2013). The identified challenges are in accordance to Velebit et al. (2008), who found that lack of medical expertise and economic constraints in low and middle income countries prove to be challenging and are some of the difficulties faced by them in establishing and sustaining cardiac centres. As a result, most developing countries refer patients to countries abroad and also rely on the visiting cardiothoracic surgeons from advanced countries.

Unlike developed countries like China where there are more than 170 cardiac centres where different types of cardiac surgery are performed annually (Pezzella, 2009), Tanzania has only



one centre. Similarly Hugo-Hamman, Du Toit, Vosloo, and Kaaya, (2011) reports that Namibia had no cardiac centre until 2010 and the majority of the patients were referred outside the country, mainly South Africa. Likewise, Zambian patients who require this type health care service are referred abroad at very high costs (Musuku et al., 2013). Lack of equipment, infrastructure and skilled manpower are among the reasons for the country to refer Zambian cardiovascular patients abroad. Stolf (2007) argues that referring patients who require cardiothoracic surgery to more developed countries is the worst option instead of training their own experts. The author stresses that country and society incur more costs by referring patients abroad than bringing cardiothoracic surgeons to operate in a respective country which will also benefit society and local surgeons will also acquire knowledge by their participation. Although the governments in the developing countries send patients abroad for these types of surgeries, still they cannot afford the excessive costs for every needy citizen (Musuku et al., 2013; Stolf, 2007).

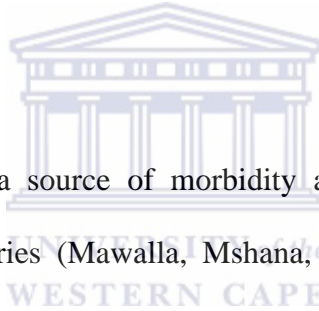


Most evolving countries would like to establish their own cardiac centres; but establishing and sustaining a cardiac centre is a challenge due to the fact that the running costs are very high (Pezzella, 2010; Airan, 2005;). Sustainability of the cardiac centre is a challenge in low and middle income countries due to the fact that cardiac surgery is complex and consumes intensive resources (WSA, 2011). The centre requires skilled cardiac surgeons, anaesthesiologists, and a constant supply of surgical instruments, as well as other consumables. The high cost of one procedure is therefore contributed by high infrastructure cost required and high cost of importing appropriate disposable goods required for the specific procedure (WSA, 2011; Airan, 2005). Not only that, but also implementation of preventive measures of post-operative complications is a challenge in low and middle income

countries which can lead to mortality, re-operation or prolong hospital stay leading to more utilisation of health care resources (WSA, 2011).

#### **2.4 Post-operative complication**

As described earlier, there could be post-operative complications in post-cardiac surgery which might lead to prolonged hospital stay. Laupland, Kirkpatrick, Kortbeek, and Zuege, (2006) described prolonged ICU stay as a length of ICU stay for about 2 to 3 weeks from the day of ICU admission. The stay is associated with infections and complications in the course of management. The majority of patients with a prolonged ICU stay have been associated with high risk of death following cardiac surgery but those who survive, are reported to have improved outcomes following hospital discharge (Laupland et al., 2006).



Surgical site infection remains a source of morbidity and high mortality in developing countries following major surgeries (Mawalla, Mshana, Chalya, Imirzalioglu, & Mahalu, 2011). Infection of the surgical site is a serious type of complication following cardiac surgery that usually prolongs hospitalisation and mortality (Guillou, 2011). Hence, specific preventive measures to reduce surgical site infections should be considered prior to surgery (Mawalla et al., 2011).

According to Alhan et al. (2003), red blood transfusion post-operatively was found to be an independent risk factor for prolonged hospitalisation, hospital re-admission and increased mortality. In another study, red blood transfusion following cardiac surgery accounted for 70% of the mortality post cardiac surgery (Engoren et al., 2002). Red blood transfusion usually delays early extubation which positions patients in danger of developing other chest

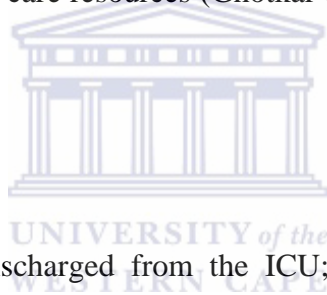
complications, hence increases hospital stay and consumption of the hospital care resources (Alhan et al., 2003).

It was also reported that, the pre-operative status of the cardiac patient can be a reason for the post-operative complications. Newman et al. (2006) indicated that post-operative prognosis and neurological complications were largely depending on the number of pre-operative factors. In a study conducted in UK, the pre-operative physiognomies such as aged patients, high New York Heart Association (NYHA) class, obesity patients, patients with renal dysfunction and hypertensive patients had prolonged hospital stay after cardiac surgery (Ghotkar, Grayson, Fabri, Dihmis, & Pullan, 2006). Also the pre-operative factors such as unstable angina and peripheral vascular disease, previous coronary artery bypass graft (CABG) and history of neurological diseases increases chances of post-operative complications and mortality (Newman et al., 2006; Weissman, 2004). It has been observed that diabetic patients who were scheduled to cardiac surgery are also associated with a worsened hospital outcome due to poor control of intra-operative glycaemic control (Ghotkar et al., 2006; Hulzebos et al., 2006; Ouattara et al., 2005). According to Lee, Buth, Martin, Yip, and Hirsch, (2010), patients with less mobility, and high age pre-operatively were seen to require more innovative process of care in order to reduce chances of long hospital stay and mortality (Lee et al., 2010).

Emergency cardiac surgeries and patients with chronic obstructive pulmonary disease have been reported to increase chances of post-operative complication (Hulzebos et al., 2006). On the other hand, gender difference during pre-operative phase has impact on the hospital stay and mortality. Guru, Femes, Austin, Blackstone, and Tu, (2006) established that women had

more pre-operative complex clinical presentation than men. Thus recommends a close follow-up soon after surgery to reduce chances of developing complications.

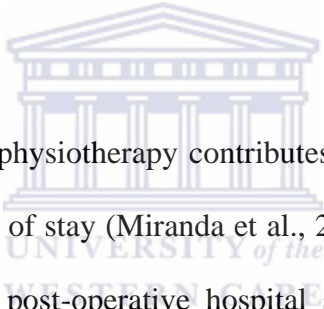
Patients with post-cardiac surgery complications are associated with developing a wide range of serious impairments that may interfere with their optimal functional outcome (Masud et al., 2011). The underlying impairments, if not taken care of, lead to loss of functional independence hence poor quality of life of an individual and extended period of cardiac rehabilitation following discharge from the hospital. However, prevention of these risk factors is obscure and the incidences rise with the age which increases the economic burden of both society and health care resources (Ghotkar et al., 2006; Laupland et al., 2006; Alhan et al., 2003).



For a patient outcome to be discharged from the ICU; depends on the care and close management which involves much on health care providers (Masud et al., 2011). It is to be noted that physiotherapy has descensible effects if trained physiotherapists are available to provide required service and timing of care (Hanekom, Louw & Coetzee, 2013). Poor close follow up post-operatively could contribute to pulmonary complications which could lead to mortality or prolonged hospital stay. A multidisciplinary intervention with a combined programme of mental preparation, metabolic, and physical prior to cardiac surgery may help improve quality of life, lower systolic blood pressure, and reduce levels of oxidative stress hence promote recovery post-operatively (Hadj et al., 2006).

## **2.5 The role of physiotherapy in relation to cardiac surgery**

The role of physiotherapy has been well described in the guidelines presented by the New Zealand guidelines group (2002) in terms of physical and cardiovascular assessment. The patient's physical needs and the level of cardiovascular fitness are the components guiding the physiotherapist to plan for convenient and effective programme based on a particular patient. Using holistic approach, the guideline adds that physiotherapists should focus more on the prevention of the complications, health promotion to maintain a healthy lifestyle, general rehabilitation and facilitation of performance enhancement. Furthermore, the New Zealand guideline augments that individual functional level of independence is the key to therapy in order to facilitate early return to routine activities and work at large.



Pre-operative and post-operative physiotherapy contributes to early functional recovery and assists in reducing hospital length of stay (Miranda et al., 2011). It has been shown in Brazil and elsewhere that, the average post-operative hospital stay is six to eight days for the patients receiving daily effective physiotherapy from admission date to discharge date (Hulzebos et al., 2006; Borghi-Silva et al., 2005). As part of the cardiac multidisciplinary treatment plan, physiotherapy care is prescribed in the ICU (Arcêncio et al., 2008). However, there are different opinions on the effective physiotherapy as there is variation of practices among therapists (Norrenberg & Vincent, 2000). There is evidence that early exposure to physical activities and close follow up helps the patient improve functionally (Pająk & Kozela, 2012; Mensah & Brown, 2007). Physical activity and exercise in general have been reported to reduce cardiac mortality for up to 26% for both healthy and people with cardiovascular diseases as compared to routine standard of medical care (Moholdt et al., 2009). It is therefore significant to involve physiotherapy treatment in pre- and post-operative phases of cardiac surgery (Lomi & Westerdahl, 2013). Although

physiotherapy care is considered as a time-consuming treatment, but it is valuable in diminishing respiratory and motor complication and facilitating post-operative recovery (Arcêncio et al., 2008).

### **2.5.1 Pre-operative phase**

Physiotherapists are involved in the preparation and rehabilitation of cardiovascular patients prior to cardiac surgery (Miranda et al., 2011). The basis for their involvement is to reduce chances for the development of post-operative respiratory complications (Miranda et al., 2011). According to Valkenet et al. (2011), pre-operative physiotherapy can also be effective in diminishing chances of developing post-operative chest complications and reducing prolonged hospitalisation. In their study they concluded that pre-operative physiotherapy intervention should be considered as part of the standard pre-operative care for patients undergoing cardiac and abdominal surgeries. Indeed it is recommended that for the best outcome in the post-operative phase, the at-risk patients who are likely to develop complications should be given attention prior to cardiac surgery (Toumpoulis, et al., 2006). However, Hulzebos et al., (2006) argue that there is only limited effect of pre-operative physiotherapy in the prevention of post-operative complications. In their systematic review; they could not establish evidence on the effectiveness of therapeutic techniques frequently used pre-operatively to the adults scheduled for cardiac surgery. Their review investigated breathing exercises, coughing exercises, and inspiratory muscle training. It is to be noted that, there are different approaches used widely by physiotherapists which could be a reason for the controversy and lack of conclusive evidence on the best approach (Arcêncio et al., 2008). Although there are debates on the best therapeutic technique to be used in this phase, other

studies shows the usefulness of pre-operative physiotherapy intervention in the prevention and reduction of post-operative chest complications (Miranda et al., 2011).

Cardiac surgery reduces the inspiratory muscle strength of an individual and pulmonary volume thus creates environments for post-operative pulmonary complications (Borghi-Silva et al., 2005). Although post-operative lung volumes does not only depend on the activity of respiratory muscles and its mechanical properties, but increased airway resistance, and reduction of lung compliance are also associated with post-surgical respiratory complications (Miranda et al., 2011). The pre-operative weakness of the inspiratory muscle strength is found to be a risk factor for the post-operative pulmonary complications (Tomich et al., 2007). In fact, effective training prior to cardiac surgery improves lung functional capacity of an individual (Saglam et al., 2008) and so help shorten days of hospitalisation by facilitating quick recovery post-operatively (Hulzebos et al., 2006). Thus a physiotherapy intervention in a pre-operative phase has shown to improve the functional capacity of the heart prior to cardiac surgery through regular exercise (Hadj et al., 2006; Laghi & Tobin, 2003).

Pre-operative physiotherapy intervention is a primary foundation for the post-operative outcome as different approaches such as stair climbing, health education and counseling are employed (Overend et al., 2010). An effective pre-operative exercise of up to 14 days has shown to improve inspiratory muscle strength up to 36% which play an important role in reducing post-operative pulmonary complications (Olsén & Anzén, 2012). The rationale for physiotherapy pre-operative intervention is to facilitate recovery post-operatively in the intensive care unit (Moreno et al., 2011), hence promoting functional recovery of a patient

leading to shorter hospital stay (Valkenet et al., 2011; Brasher, McClelland, Denehy, Story, & Yang, 2003).

To attain the goal of exercise tolerance of a patient, literature indicates two approaches which can be used for the pre-operative physiotherapy interventions. Wynne and Botti, (2004) shows evidence of the benefit of hospital based exercise programme in a pre-operative phase. The study has demonstrated the effectiveness of the programme on the post-operative outcome for the patients who are admitted within the hospital setting prior to cardiac surgery. However, during this period of waiting for the cardiac surgery, Herdy et al. (2008) debates that there could be also the risk of immobilisation if a patient waits long before surgery. On the other hand, home based exercise programme has also been reported to be effective if patients would comply with the programme prescribed by the physiotherapist (Hulzebos et al., 2006). The home programme was also found to be cost effective. Decades ago Arthur, Daniels, McKelvie, Hirsh and Rush (2000) reported on the increased level of the fitness among patients scheduled for coronary artery bypass graft (CABG) who were trained twice a week for ten weeks as part of home based programme.

In the pre-operative phase, assessment of functional capacity of a patient and educating the patient on the exercises are the two main goals of the physiotherapists (Leguisamo, Kalil, & Furlani, 2005). Regarding assessment, studies suggest the inclusion of the patient's history of previous pulmonary infections, information on smoking habits, and other social demographics like obesity and age (Miranda et al., 2011; Arcêncio et al., 2008). With respect to education, information about risk of chest complications, significance of early mobilisation and sternotomy restrictions are supposed to be part of pre-operative education



(Westerdahl & Möller, 2010; Reeve, Denehy & Stiller, 2007). Information on how to get out of bed and chair, huffing and coughing techniques, breathing exercises and lower limb mobilisation are also mentioned. It is therefore important to conduct pre-operative education simply because patients, who receive pre-operative education, become co-operative post-operative, due to their understanding of the importance of exercises (Leguisamo et al., 2005). Through this guidance provided pre-operatively, the patient becomes aware of their responsibilities post-operatively (Miranda et al., 2011; Westerdahl & Möller, 2010).

According Yáñez-Brage et al. (2009), pre-operative physiotherapy intervention reduces the incidence of atelectasis. In their study they used the likes of assisted cough, deep breathing exercises, incentive spirometry and early ambulation in pre-operative phase. Conversely, Westerdahl et al. (2005) reported that deep breathing as a single technique used with or without other techniques pre-operatively reduced atelectasis. In contrast, in another study by Brasher et al. (2003), the authors retained that breathing exercises had no significant impact when removed from routine pre-operative physiotherapy.

Still, there are arguments for what is the best pre-operative physiotherapy practice in at-risk and non-risk types of patients scheduled for cardiac surgery (Borghi-Silva et al., 2005). This study maintains that different techniques may have similar results in post-operative phase if administered properly with close follow-up and compliance of the patients. But the authors stress that it is the responsibility of the respective physiotherapists who assessed the patient to decide the appropriate technique based on the need of the patient, availability of resources, devices and current evidence-based knowledge.

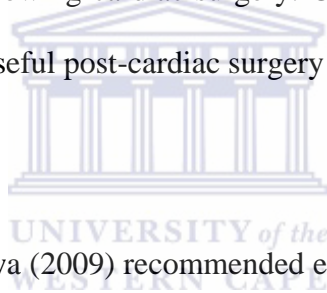
In this phase, special attention is advised on the at-risk group of patients such as patients with remarkable low pulmonary volume, low functional lung capacity and poor ventilatory muscle strength (Morsch et al., 2009). Hulzebos et al. (2006) indicates that elderly patients, patients with long term chest complications and long term bedridden patients scheduled for cardiac surgery; require closer monitoring pre-operatively since they are at more risk of developing pneumonia and other post-operative pulmonary complications.

### **2.5.2 Post-operative physiotherapy care**

Following cardiac surgery, the functional residue capacity (FRC) of the lungs decreases (Moreno et al., 2011). Cardiac surgery weakens inspiratory muscle strength and lowers the functional residual capacity (FRC) of the lungs (Borghi-Silva et al., 2005). Correspondingly, general anaesthesia also contributes to reducing about 20% of the individual FRC (Romanini et al., 2007). In another study by Miranda et al. (2011), it was revealed that post-operative pain is also associated with the reduced FRC, hence impairment of ventilation. As a result, the majority of the patients are susceptible to pulmonary complications which are responsible for prolonged hospital stay, morbidity and mortality (Felcar, Guitti, Marson, & Cardoso, 2008; Romanini et al., 2007). Even though there is transformation of technology in cardiac surgery procedures, impairment of lung functions post-operatively is still significant (Borghi-Silva et al., 2005). For example, Pasquina, Tramèr and Walder, (2003) recorded approximately 65% of patients who developed post-operative atelectasis and 3% pneumonia respectively. These respiratory complications, and other motor and physical complications, necessitate a multidisciplinary team approach with involvement of physiotherapists in ICU until convalescence (Arcêncio, et al., 2008).

To be sure, physiotherapy involvement in the management of patients following cardiac surgery is largely in prevention and diminishing respiratory complications (Westerdahl et al., 2005; Brasher et al., 2003). The major role of the physiotherapist is to guide the patient on the use of ventilatory muscles and facilitate mobility (Renault, Costa-Val, Rossetti, & Hourí Neto, 2009; Renault et al., 2008).

Exercise prescription is an important part of physiotherapy in the field of cardio-pulmonary. Different studies have shown variety of techniques which can be used. In the beginning of last decade, Patman, Sanderson and Blackmore (2001) suggested the use of positioning on bed and chair, and vibrations following cardiac surgery. Chest vibration is also documented by Borghi-Silva et al. (2005) as useful post-cardiac surgery for patients with secretions.



In their study, Ueno and Tomizawa (2009) recommended exercise therapy in a post-operative phase 1 of cardiac rehabilitation as an effective component. Under exercise therapy, different approaches such as aerobics are involved in maintaining inspiratory muscle strength. According to Hulzebos et al. (2006), the good state of patient post-operatively is principally dependent on the pre-operative training and maintenance of inspiratory muscle strength. To increase inspiratory muscle strength, various techniques of chest expansion exercises and posture correction is reported to improve the autonomic tone of the heart muscles (Moreno et al., 2011; Westerdahl & Möller, 2010). Kinesiotherapy is also mentioned to be useful in this phase as the majority of the patients may struggle with pain, hence develop poor postural habits, mobility and unfortunate endurance (Brasher et al., 2003). According to Ueshima et al. (2004), carrying out exercise therapy, especially for patients undergoing

valvular heart surgery is very beneficial in prevention of pulmonary complications and facilitation of functional recovery.

To increase FRC of the lungs, various therapeutic techniques are employed, such as breathing exercises, which have been shown to be effective in reducing atelectasis (Westerdahl & Olsén, 2011). Incentive Spirometry can be used as an assessment tool to monitor progress and treatment instrument at the same time (Pinheiro et al., 2011). Under this phase, most of the studies agree that incentive spirometry with or without a combination of breathing exercises such as diaphragmatic breathing, has the same effect of improving lung function and diminishing chances of post-operative complications (Yamaguti et al., 2010; Agostini, Calvert, Subramanian, & Naidu, 2008; Tomich et al. 2007). In their studies, Westerdahl, et al. (2005) and, Brasher et al. (2003) applauded breathing exercises as vital in improving tidal volume. Similarly, Agostini et al. (2008), concludes that incentive spirometry can also be useful as an assessment tool in monitoring the progress of the patient. Brasher et al. (2003) used a combination of approaches applicable post-operatively such as positioning to allow good ventilation, deep breathing and cough stimulation, as well as early ambulation. Cough stimulation was recorded to be effective in reducing bronchial secretions (Borgh-Silva et al., 2005; Hulzebos, Van Meeteren, De Bie, Dagnelie, & Helders, 2003).

Limb mobilisation, a range of motion and walking within ICU, has been reported to have significant effect post-operatively (Perme & Chandrashekar, 2009; Schweickert et al., 2009; Haeffener, Ferreira, Barreto, Arena, & Dall'Ago, 2008; Morris et al., 2008). These types of exercises help to improve endurance, exercise tolerance, functional ability and an increased level of independence of the patient that can lead to shortening length of hospital stay.

However, there is no consensus in the literature with regard to the way of and the procedures of performing limb and trunk mobilisation exercises (Herdy et al., 2008; Hirschhorn, Richards, Mungovan, Morris, & Adams, 2008). Although the literature is agreed on the subject of early mobilisation, there is still a question on how early the intervention should start and the procedures of limb and trunk mobilisation exercises (Herdy et al., 2008; Hirschhorn et al., 2008).

Dosage of the therapy is still a challenge among physiotherapists. The main challenge of having global standardised protocol is due to physiological imbalance between patients and their coping strategy following cardiac surgery (Kirkeby-Garstad, Stenseth & Sellevold, 2005; Gomes, 2000). It is in this regard that Romanini et al. (2007) suggests that physiotherapists' prescription of exercise should primarily base on the mechanism of complication and physiopathology that is involved in the pulmonary dysfunctions of the respective patient. Furthermore, the findings documented following assessment of the patient should guide the therapist before prescribing appropriate technique and its dosage in terms of frequency, time and intensity. It is therefore seems difficult to set a standardised dosage of the therapy globally.

Although the type of therapeutic techniques and its dosage for the high risk patients has not been ascertained, there are commonalities of various physiotherapy techniques (Overend et al., 2010). The study by De Macedo et al. (2011), disputes that evidence-based prescriptions should be the priority to reduce questions and controversies among physiotherapists and other medical practitioners. Regardless of the variations in terms of dosage, intensity, and frequency of treatment; different studies have shown that daily

physiotherapy has more impact than alternative day therapy (Dias et al., 2011; Urell et al., 2011; Mendes et al., 2010; Hulzebos et al., 2006).

In one study conducted in Australia, it was concluded that there was no evidence to support post-operative physiotherapy intervention following cardiac surgery in relation to the hospital stay (Patman et al., 2001). In contrast, Akdur et al. (2002) settled on the significance of physiotherapy to the long intubated patients who are likely to develop atelectasis and pneumonia. However, their evidence was not enough to convince Pasquina et al. (2003) who did not establish the significance of doing respiratory physiotherapy in the prevention of the post-cardiac surgery pulmonary complication. The authors therefore concluded that respiratory physiotherapy only increases the burden of cost to the cardiac patients as its significance is unproven. On the side of prophylactic therapy, there is sporadic of evidence to support its benefit to the patients with pneumonia and atelectasis (Pasquina et al., 2003). The situation is reported to be comparable to patients who underwent valvular surgery (Hulzebos et al., 2006).

The functional capacity of the patient pre- and post-operatively can be assessed by specific measures. Among them is the six minute walk test. According to Enright et al. (2003), the six minute walk test (6MWT) is widely valued as a standardised tool that is commonly used by clinicians to evaluate and assess the prognosis of the patient. The study further elaborate that the test is both assessing the mobility and functional exercise capacity following cardiac surgery. The test is also measures the endurance of a person with cardio-pulmonary disease as it provides clinical sensitive indicator of the patient (Rasekaba, Lee, Naughton, Williams, & Holland 2009). The 6-minute walk distance (6MWD) as the primary outcome of 6MWT

has been used interchangeably, as the treatment rather than a stress test in both pre- and post-operative phase of cardiac rehabilitation (Verrill, Barton, Beasley, Lippard, & King, 2003; Gibbons, 2002). It is therefore concluded by Bellet, Adams, and Morris, (2012) as a suitable tool for outcome assessment for both phases of cardiac rehabilitation. In other studies, Roitman and Kalra, (2007) and Leung, Chan, Sykes, and Chan, (2006) validated the 2 minute walk test (2MWT) and concluded that it can also be used as an outcome measure for patients with moderate to severe and COPD as well as cardiac rehabilitation.

## **2.6 Perceptions of physiotherapy care in cardiac surgery**

Although physiotherapists are supposed to be among members of a multidisciplinary team in cardiac surgery, their role has been questioned (Stiller, 2000). Physiotherapy service in cardiac surgery is perceived differently by different health professionals. There are different opinions from other medical personnel concerning the role of physiotherapy, especially in the ICU. Jones (2001) conducted a large survey regarding the perceptions of involving physiotherapists in the ICU among medical directors. A survey included five countries, from five continents, i.e. Australia, UK, Canada, Hong Kong and South Africa. The study revealed that almost 60% of the medical directors considered physiotherapy services as normal work that could be performed by any other health staff. This is in accordance to Slinger and Darling (2011) who perceived that family members of the patients or non-physiotherapy hospital staff be trained to perform effective pre-operative chest physiotherapy during hospital admission of the patient. From the nursing perspective, Inwood (2002) comprehends the significance of involving physiotherapy as early as possible to prevent chest complications, although sometimes it may provoke unsolicited cardiorespiratory effects. Masud et al. (2011) perceive that physiotherapy care is more beneficial if prescribed in the high risk group of patients, than it is usually used generally. The study also reported that patients with a risk of developing physical and non-physical limitations such as those with

advanced age, co-morbidities, and high severity of illness, would benefit more with physiotherapy intervention.

In the case of physiotherapy care on weekends and holidays, McAuley (1999) stated that physiotherapy services should only focus on a special risk group of patients who present with excessive secretions and those who are prone to developing respiratory complications. However, Miranda et al. (2011) argues that, this is contrary to the role of physiotherapy, which is more of preventive and facilitation of physical activities.

Regarding different perceptions, Norrenberg and Vincent, (2000) allude that physiotherapists are responsible for the different perceptions due to the variations of physiotherapy care in ICU. As a result, most medical practitioners are unaware of what physiotherapy is all about. This was also comprehended by a nursing study Inwood (2002) who argue that chest physiotherapy is not well defined by physiotherapists.

Alongside all the perceptions, one cardiac surgeon (Airan, 2005) advocates a good relationship among health care practitioners simply because a patient's welfare is the primary purpose of a cardiac multidisciplinary team. In order to reduce the negative perceptions, literature suggests the use of daily systematic documentation, use of outcome measure tools of functional performance such as Modified Borg Scale (MBS) and research among therapists (Hanekom et al., 2013; Roos, Van Aswegen, & Eales, 2002; Nava & Ambrosino 2000). Furthermore, daily systematic documentation of physiotherapy interventions related to accepted outcome measures by clinicians has the potential to lay the groundwork for multi-centre observational studies within the speciality of cardio-pulmonary physiotherapy.



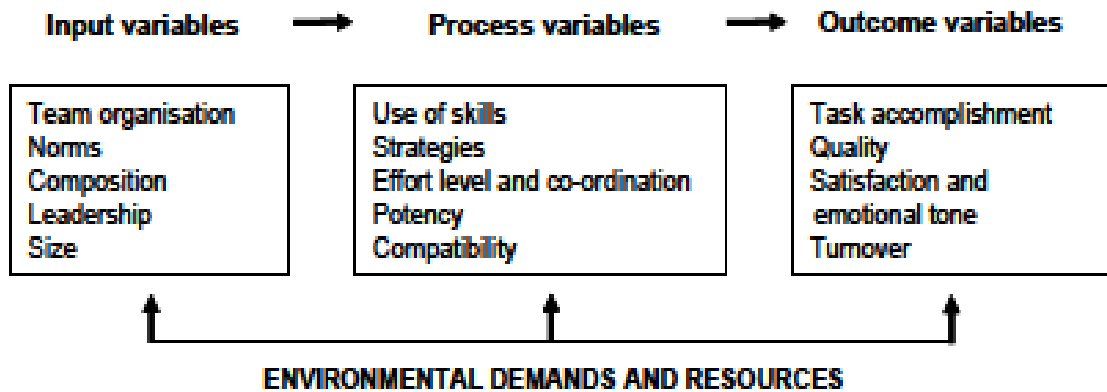
## 2.7 Conceptual framework: Model of Team Effectiveness

This study used the Model of Team Effectiveness (MTE) proposed by Klimoski and Jones (1995) which is illustrated in Figure 2.1 below. The model incorporates three steps namely input, process and outcome variables.

The model describes **input** in five areas namely organisation, norms, composition, leadership and size.

**Organisation:** refers to the way team members divide their responsibilities in a certain work (Klimoski & Jones, 1995). In this study, this refers the role of different health professionals in the management of patients following cardiac surgery at MNH. Following cardiac surgery, anaesthesiologists and cardiac surgeons review the patient hourly to monitor the recovery following cardiac surgery. On the first day post-operation, physiotherapists intervene to facilitate FRC of the lung (Norlén, 2003). Both health professionals aim at helping patient to recover (Airan, 2005).

**Norms:** the maintenance of a higher standard of service depending on the standards set to be attained by different professionals (Klimoski & Jones, 1995). In this case, there is treatment protocol at MNH which guides physiotherapy in attending cardio-pulmonary patients. Using the guide, physiotherapist set treatment goals pre-operatively and post-operatively. However, there is a challenge in this area at MNH cardiac unit in relation to the team work standard as it will be described further in a discussion of results.



**Figure 2.1: Klimoski and Jones Model of Team Effectiveness (1995)**

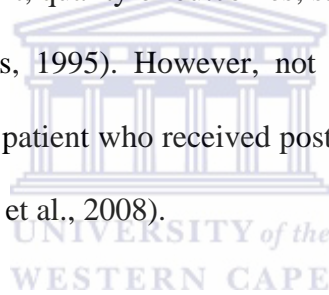
**Composition:** refers to the performance which depends on individual creativity and abilities of team members (Morgan, Lassiter, Swezey, & Salas, 1992). Some patients develop complications which require more attention and use of new techniques to prevent further complications. Involving other disciplines works better in achieving the desired goals instead of working on an individual goal (Airan, 2005).

**Leadership:** in order to attain performance of the team, there must be internal co-ordination and integration among team members (Klimoski & Jones, 1995). In this case, the cardiac surgeon is the leader of the cardiac multidisciplinary team at MNH cardiac unit following cardiac surgery in the ICU. Post ICU, the cardiologist coordinates the multidisciplinary team which involves other disciplines pre-operatively. The challenge is the involvement of the physiotherapist in the current set-up.

**Size:** a small team is easily coordinated (Klimoski & Jones, 1995). The cardiac team at MNH cardiac centre amongst others is comprised of a Paediatric Cardiologist, Adult Cardiologist, Cardiac Surgeons Cardiothoracic Anaesthesiologist, Clinical Perfusionist and Nurses (MNH, 2012).

**Process:** the term is described as the use of skills, strategies, effort level and co-ordination, potency, and compatibility which are the key areas of the team work (Klimoski & Jones, 1995). Furthermore common strategy should be set while individual role is exercised to attain the desired goal. The researcher perceives that there might be a challenge in exercising one's role if the role of individual team members is not well understood among other team members. To face this challenge, communication, interaction and sharing information facilitates the performance and effectiveness of a team (Gravelly-Witte et al., 2009; North Atlantic Treaty Organization, 2005).

The **output** is task accomplishment; quality of outcomes; satisfaction and emotional tone; and turnover (Klimoski & Jones, 1995). However, not every task accomplished has quality and not necessarily every patient who received post-operative physiotherapy, will have the best outcome (Arcêncio, et al., 2008).



## **2.8 Summary**

The literature reviewed highlighted the burden of cardiovascular diseases in developed, middle and low income countries. The burden of surgical procedures in the management of cardiovascular diseases as a public health issue was also explicated. The physiotherapy process of care for patients undergoing cardiac surgery was reviewed in terms of pre-operative and post-operative interventions. Finally, the conceptual model of team work effectiveness used in this study was expounded.

## **CHAPTER THREE**

### **METHODOLOGY**

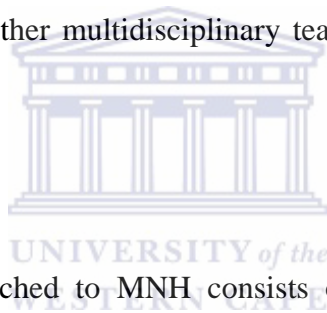
#### **3.1 Introduction**

This chapter describes the methodological approach used in this study. It includes the research setting, the study design, methods of data collection for both quantitative and qualitative phases. The ethical considerations are also spelt out.

#### **3.2 Research setting**

The country is situated in East Africa, bordered by Kenya, and Uganda to the north; Burundi, Rwanda and Democratic Republic of Congo to the west; and Malawi, Zambia to the southwest and Mozambique to the south. The country's eastern border is formed by the Indian Ocean. The study was carried out at Muhimbili National Hospital (MNH) which is the largest referral and teaching hospital in the country, located in Dar es Salaam, the commercial capital of Tanzania. Dar es Salaam is a cosmopolitan city of 4.31 million inhabitants, which is almost a tenth of the entire population of more than 46 million (2012 census). It has the only largest, national referral hospital built since 1910. There are three other referral hospitals (KCMC, Moshi; Bugando, Mwanza; and Mbeya) and each of the 26 regions has a regional hospital. The MNH serves patients referred from three municipal hospitals in Dar es Salaam (i.e. Temeke, Kinondoni and Ilala) as well as patients from other referral and regional hospitals across the country.

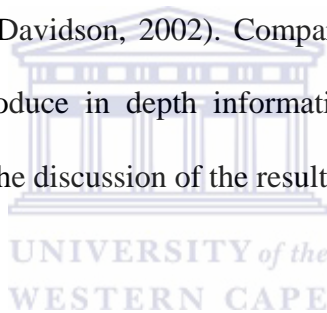
MNH is 3,000 bed health complex, attending to about 1500 out-patients daily, referred from private and public hospitals across the country (MNH, 2014). It employs 2,700 staff in its 106 units ranging from dentistry to pharmacy. There are more than 300 Doctors (including 2 Cardiothoracic Surgeons), 900 nurses and 18 Physiotherapists. The hospital has 25 departments, including emergency medicine, internal medicine, surgery, and rehabilitative medicine providing preventive, curative and rehabilitation as part of health services nationwide. Physiotherapy is a unit under the rehabilitative medicine department attending to in-patients and out-patients referred from all departments at MNH. The department consists of 18 Physiotherapists, 5 Occupational Therapists and 9 support staff. The physiotherapists are working full time on a daily basis attending in-patients and out-patients. They also participate in the major ward rounds with other multidisciplinary team members. The Physiotherapists are allocated to different wards.



The Cardiac Unit which is attached to MNH consists of Cardiologists, Nurses, Cardiac Surgeons, Anesthesiologists and Perfusionists, among others. There is one Physiotherapist accountable for cardio-pulmonary patients from rehabilitative medicine department who is not permanently stationed in the cardiac unit. At MNH cardiac unit, the patients are first attended to a Cardiologist who does all investigations to identify the magnitude of the ailment. If the condition requires surgery, the patient is referred to the cardiac panel which involves Cardiac Surgeons and other members who discuss the patient before scheduling for surgery. Following cardiac surgery, the patient is admitted in the ICU before being moved to the Cardiac Ward in preparation for discharge.

### **3.3 Research design**

An explanatory sequential mixed methods design was employed starting with quantitative data collection, review and analysis, which were followed by qualitative data collection and analysis. A mixed methods approach helps the researcher to achieve extensiveness, depth, and understanding of the area to be researched (Johnson, Onwuegbuzie & Turner, 2007). The quantitative approach helps the researcher identify the outcome measure involved in the study through controlling measurements (Carter, Lubinsky & Domholdst, 2011). Thus using numeric to present the identified findings of the area studied (Babbie & Mouton, 2006). The qualitative approach is adopted to better understand the meanings, experiences, attitudes and perception of diverse groups of human beings (Scharlach, et al., 2006; Meadows, 2003; Fossey, Harvey, McDermott, & Davidson, 2002). Compared to the quantitative techniques; the qualitative approach can produce in depth information from the respondents (Mann, 2012). The two are integrated in the discussion of the results.



### **3.4 Methods of data collection**

#### **3.4.1 Quantitative phase**

In this phase, information was gathered regarding the profile and process of physiotherapy care of the patients undergoing cardiac surgery at MNH.

#### **Study population and sample**

The population of the study consisted of all the patients that had cardiac surgery performed on from May 2008 to December 2013. The study of Nyawawa et al. (2010) reported on cardiac surgery in Tanzania up to the end of 2009. Therefore the researcher conveniently sampled all records from January 2010 to December 2013 to be included. The study included all records

of adult patients' from 18 years and above. Patients transferred from other cardiac units after cardiac surgery, both within and outside Tanzania, were excluded in this study.

### **Research instrument**

The researcher used a data extraction sheet (*Addendum J*) for the collection of past information from the records. Portrayed as an ideal tool in extracting stored past information (Elamin et al., 2009); the data extraction sheet was chosen because it fits in this study for extracting a multiplicity of past records/ information.

The researcher adopted a data extraction sheet from Nyawawa et al. (2010) which was used to capture the outcome and treatment of cardiac surgery in Tanzania; however, it was modified in order to suit the objectives of this study. The modified version included all the information of the version of Nyawawa et al. (2010) but also included additional information regarding the process of physiotherapy care. The data sheet which was used in this study had four sections. Section A contained the socio demographic information including age, gender, type of surgery, condition and diagnosis as confirmed by ECG. Section B extracted information about the hospital stay in days which included pre-operative hospital stay, ICU hospital stay and ward hospital stay. Section C enquired about the outcomes of management, if any complication were present, discharge information as well as mortality. Lastly, Section D extracted information with regard to the physiotherapy care (i.e. pre-operative, ICU and ward) and content of therapy.

Literature suggests the use of content validity as a mode of validating a data extraction sheet before gathering information by asking experts in the area of a study to give their opinion (Twycross & Shields, 2004). Babbie and Mouton (2006) describes validity as the extent

whereby the researcher gathers relevant intended information. To validate the data extraction sheet used in this study, two Supervisors and one senior Physiotherapist were consulted regarding the constructs of the data extraction sheet to assess if it answers the intended objectives of the study.

### **Reliability testing of the instrument**

The reliability of the tool was tested by conducting a pilot study. The pilot study which is considered a small scale study conducted prior to the major study (Cherry, 2009) was conducted by the researcher and a trained research assistant. The researcher and research assistant both extracted information from 15 patients' folders independently. This assured reliability of the instrument which is described as the consistency of a measure with the same results between two independent sources (Cherry, 2009). The main purpose of conducting a pilot study was to test and establish the time accuracy of data sheet in all four sections and to determine if any improvement was needed before applying it. Discrepancies like re-arranging content in Section D was discussed and corrected before the data sheet was applied in the study. During piloting, it was found that the instrument covered the necessary information. The researcher and research assistant spent 15 – 20 minutes to fill in one data sheet.

### **Procedure**

The data collection process commenced after approval from relevant authorities as described under Ethics in Section 3.5. Having permission for data collection from MNH management, the researcher approached the Head of the Medical Record Department and Head of Cardiovascular Medicine Department at MNH. The researcher then explained the aims, objectives, rationale and significance of the study and why it was being conducted at MNH. This information was made available in the information sheet (*Addendum D*). The researcher



assured the concerned Heads that confidentiality and anonymity would be observed during the whole process of data collection, analysis of result and writing the final report and that special codes were to be used instead of hospital numbers and names of the patients. Questions about the study were responded too. The information gathered, including the ledger book was highly protected, as the data extraction was locked in a secure place and only the researcher had access to the information. Again, only the researcher has had access to the captured information in the SPSS.

### **Data collection**

Data was collected from patients' folders retrospectively covering the period from January 2010 to December 2013. Being responsible for all patients attended to at MNH cardiac unit, the Head of Cardiovascular Medicine Department consented by signing a prepared consent form (*Addendum G*). Then data collection began after consent was signed. The researcher and researcher assistant accessed patients' folders from the main Health Record Office and its unit under the cardiac complex. The folders were taken back after extraction of all the information.

### **Data extraction**

To make sure that all subjects were included in the study, the researcher first accessed the daily nursing admission book and a list of patients undergoing cardiac surgery in a Cardiac Ward which was compared to ICU and theatre procedure books. The subjects' hospital numbers were recorded in a ledger book. The subjects' hospital numbers which were not found in the general ward, were found in cardiac ICU admission book or cardiac theatre procedure book. The hospital numbers were then taken to the Health Records Department where the subjects' folders were stored and data extraction began.

## **Data analysis**

Double data entering was done to endure the quality of data. Data was captured and analysed using SPSS 22.0. The descriptive statistics was used to summarize the socio-demographic data, characteristics of cardiac surgery, duration of hospital stay (i.e. pre- and post-operatively), outcome of management and physiotherapy treatment offered (i.e. number of treatment sessions, treatment intervals and content of therapy) was analysed and presented using frequency tables and figures. Data was expressed in means, standard deviation, and percentages.

### **3.4.2 Qualitative phase**

The researcher used the qualitative approach to explore the perceptions of Cardiac Surgeons on the role of physiotherapy following cardiac surgery and the perceptions of Physiotherapists on their role in the post-operative management of patients following cardiac surgery. The qualitative part is appropriate in broadening the understanding and perceptions of the participants in this apparently unexplored area whereby views of participants are closely examined through the “human communication, interpretation and understanding” (Smith, 2008, p 2). Moreover, the gathered verbal information from participants is closely related to their subjective accounts. It is for this reason that the qualitative part of this study seeks the meanings concealed in the quantitative element through the interactive process among these two health professionals (i.e. Cardiac surgeons and Physiotherapists) working at MNH.

### **Study population and sampling**

The study population included all Physiotherapists and Cardiac Surgeons employed at MNH. The study included full time employed Physiotherapists and Cardiac Surgeons working at MNH while excluding Physiotherapists employed from January 2013. Visiting Cardiac Surgeons were also excluded in the study. Through these criteria, the researcher gathered rich information from the experienced participants who were working in the same environments for more than a year.

### **Recruitment of participants**

The data collection process began after approval from the relevant authorities as explained in Ethics section 3.5. Appointments were granted on an individual basis and the researcher met individual Cardiac Surgeons to underline the aim, objective and significance of the study. The two Cardiac Surgeons currently working at MNH agreed to take part in the study. For the Physiotherapists, the researcher approached the Head of Rehabilitation Department to seek an appointment to conduct presentation to all Physiotherapists at their usual weekly meetings. The appointment was granted and the researcher informed participants on the aims, objectives and significance of the study. Of the 17 Physiotherapists\* approached, 4 were newly employed who did not meet the inclusion criteria of the study and 13 were willing to take part in the study.

From then on, the researcher and individual participants who agreed to take part in this study arranged a convenient time and venue at their convenience. Furthermore, the questions were answered before the interview. The information sheets (*Addendum E and F*) were made available to every participant who agreed to take part in this study.

\*Only 17 approached as the 18th physiotherapist is the researcher

The information sheet had explanations on the purpose of the study to be carried out, the anonymity to the participants before data collection i.e. that no name was to be mentioned during an interview, pseudonyms that numbers are to be used instead of names in the final report. Further details such as benefits and possible risks of taking part in this study, their right to withdraw at any time were also covered in the information sheet. All participants were requested to sign a written consent (*Addendum H*) on an individual basis before starting an interview. On an individual basis, the in-depth semi-structured interviews regarding their perceptions on the role of post-operative physiotherapy in the management of patients following cardiac surgery was conducted.

### **Semi-structured interview procedures**

Interview guides were developed based on available literature (Overend et al., 2010; Pryor & Prasad, 2008) and the respective objectives of the intended study. The two Supervisors from the University of the Western Cape (UWC) and the Senior Physiotherapist who did not take part in the study were involved in the process.

The researcher used a semi-structured interview guide to gather the information from the participants. Two separate semi-structured interview guides with open-ended questions were used one for the two Cardiac Surgeons (*Addendum K*) and the other for the ten Physiotherapists (*Addendum L*). To ensure consistency, the open ended questions developed were used as a guide across all participants. The interviews were conducted in a private room at the hospital using English language, which is the learning language in Tanzania. All interviews were audio recorded and a trained research assistant procured field notes which were compared to the researcher's own notes at the end of every interview.

The researcher used probing techniques to obtain more information. The use of probing provided richer information to the researcher since he could adapt the research instrument to the level of understanding and articulacy of the respondents (Fielding & Thomas, 2001). The wording and the order of the questions to the participants were kept as basic as possible (Simmons, 2001) in order to maintain consistency across participants. The interviews continued until saturation was reached, whereby there was the uniformity of themes and no new theme was coming out from the respondents (Polit & Beck, 2004). Each interview lasted between 45 to 60 minutes using flexible and in-depth questions (refer to *Addendum K & L* for instrument).

### **Data analysis**

This study used content analysis to analyse the verbal responses from both Physiotherapists and Cardiac Surgeons regarding the post-operative role of physiotherapy in the management of patients following cardiac surgery at MNH. Elo and Kynga's, (2008) describes content analysis as the appropriate means of analysing information gathered in its context where there is no previous study conducted with the same phenomenon. In this regard, this type of analysis is appropriate for this study.

The verbal data were analysed step by step as described by Polit and Beck (2004). Firstly, the collected information was transcribed verbatim (i.e. word for word). Then the researcher familiarised himself with the data by reading through the transcripts several times. This was followed by the researcher opening codes by writing initial minutes and headings in the text while reading the transcribed document (Hsieh & Shannon, 2005).

Quite a number of themes were distinguished in both groups (i.e. Cardiac Surgeons and Physiotherapists) which were coded by using different colors. Lastly the dominant themes were identified and categorised together those which were similar and dissimilar.

In the third step, the themes which appeared several times were categorised under broad headings in relation to the research question. This is complimented by Braun and Clarke, (2006) that the most important thing is not frequency of themes, rather its significance in relation to the research question. Then the researcher identified those themes which answer the research question and relevant objective.

In step four, the researcher did an examination of the themes by comparing the themes generated by the supervisors independently. Furthermore, the researcher worked through the interview data and made notes alongside the quote of the idea and the key thought of the participants as seen to correlate to the research question. In addition, the themes are well substantiated with quotes from the interview participants that best represent their views. For the case of sub-themes which emerged on the course of coding; it became apparent that the researcher did not obtain enough evidence to support some of the smaller sub-themes. Therefore, they were not included in the final report.

The fifth step of analysing qualitative data was to name and explain what each theme is about, how and why it was of significance (Braun & Clarke, 2006). Hence a description was made around the data which described its content and relevance to intended research question and respective research objective.

Finally the sixth step, whereby the researcher commenced writing the content analysis in the final report, which included the story emanating from the verbal data, themes generated and the use of literature to support the data. The whole process of data analysis involved going constantly forth and back to the original verbal and transcribed data, codes that are found and the themes generated as recommended by Braun and Clarke (2006).

### **Trustworthiness**

The researcher covered all four paradigms of the trustworthiness as described by Lincoln and Guba (1985) namely credibility, dependability, transferability and confirmability.

- (i) **Credibility:** Credibility is also referred to as internal validity. This is the confidence in the truth of the data collected by the researcher and its interpretations (Polit & Beck, 2004). In this study, credibility was ensured after verbatim transcription, whereby member checking was done to confirm participants' intention if the transcribed information had the same meaning to what they intended to express. Whenever they hesitated about the information transcribed, the audio recorded interview was re-played to the participant. However, no additional information or elaborations was brought out.

To build a more credible process regarding in-depth interviews, field notes which were written by research assistant were also used to compliment the themes identified and to facilitate interpretation of the findings. Peer debriefing was done by Senior Physiotherapists who did not participate in the study.

- (ii) **Dependability:** Dependability refers to the evidence that the process of data collection and analysis is consistent. It further means that if the same study is to be

repeated over times in a similar context it, would bring similar results (Polit & Beck, 2004; Lincoln & Guba, 1985). To ensure dependability in this study, the researcher used code-recode procedure of analysing data and the two Supervisors generated themes independently.

**(iii) Transferability:** The term transferability denotes as the magnitude to which the findings can be useful in other contexts (Lincoln & Guba, 1985). To ensure transferability of this study, the researcher used a thick description of the results through quotations while maintaining the meaning of the participant responses.

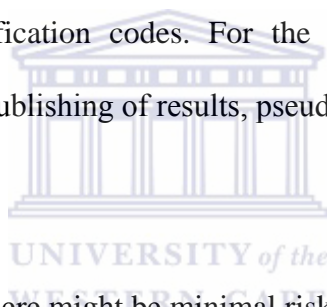
**(iv) Confirmability:** The term confirmability refers to the objectivity of the study where the outcomes are supported by the collected data (Polit & Beck, 2004; Lincoln & Guba, 1985). Furthermore, audit of the data can be done followed by agreement between two or more independent people about the relevance of the data. In this study, the audit was done by two Supervisors reading transcripts and generating themes independently. These were compared to the researcher's identified themes to identify the strength of the sentiments and complexities.

### 3.5 Ethics

Ethical clearance was obtained from the UWC Senate Higher Degrees and Ethics Committees (*Addendum A*). The request to conduct the study was then submitted to MNH for permission. Following clearance from the research committee at MNH (*Addendum C*), data collection began.



Before the participants (i.e. Physiotherapists, Cardiac Surgeons and Head of Cardiovascular Medicine Department) signed the written consent forms, they were informed about the aims and objectives of the study. The researcher highlighted the issues of confidentiality to participants as explained in the information sheet in detail. He further informed the participants that their participation in this research was completely voluntary and that they may withdraw from the study at any time without any consequences (all information is contained in the information sheet). Anonymity was ensured to all participants and MNH at large and they were informed that no names would be mentioned. The researcher used numbers and identification codes instead of names during the whole process of the data collection, analysis and interpretation of the results. Participants were assured that only the researcher has access to identification codes. For the maximum possible protection of participants' identity during the publishing of results, pseudonyms are used.



Participants were informed that there might be minimal risks associated with the study such as psychological concerns and tensions. It was further made clear that, in case of any questions or sensitivity of issues that could arise which could affect the participant during the period of this study; they would be observed and handled carefully or referred to experts for appropriate attention. The researcher explained the benefit of the study to the participants that no was direct individual benefit but the results may help the hospital MNH, government, patients and other health professionals understand the role of Physiotherapists in cardiac surgery.

On the issue of collected data, the data sheet, recorded interviews and transcripts were kept in a locked filing cabinet accessible only to the researcher. The researcher assured participants and the relevant authorities in Tanzania that after the whole process of transcribing and

documenting themes, all the information of the tape recorders would be deleted and data sheets are to be destroyed. The relevant institution and participants of this study would also be informed of the study outcomes when the final reports are available.

### **3.6 Summary**

This chapter highlighted and described the research methodology that was followed to answer the researcher objectives. The next chapter will provide a description of the qualitative results addressing the first two objectives of the study.



## CHAPTER FOUR

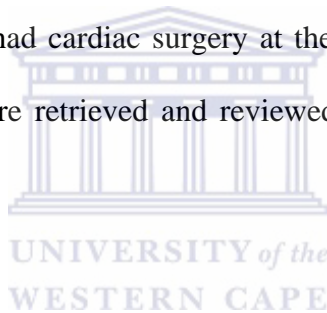
### QUANTITATIVE RESULTS

#### 4.1 Introduction

The chapter presents the findings of the analysis of data that attempts to answer the first two objectives of the study. The chapter will first provide an overview of the profile and the process of care of the patients who had cardiac surgery at Muhimbili National Hospital Cardiac Unit. The findings will be summarised in tables and illustrated by means of figures.

#### 4.2 The profile of Muhimbili Cardiac Unit

All the records of patients who had cardiac surgery at the MNH in Tanzania from January 2010 to 31<sup>st</sup> December 2013 were retrieved and reviewed. A total of 105 records met the inclusion criteria of the study.



##### 4.2.1 Socio-Demographic characteristics

The socio-demographic characteristics of the study sample are summarised in Table 4.1. The majority of the study sample (76.2%) was under the age of 38 years. More than half (54.3%) of the study sample were female as summarised in Table 4.1 below.

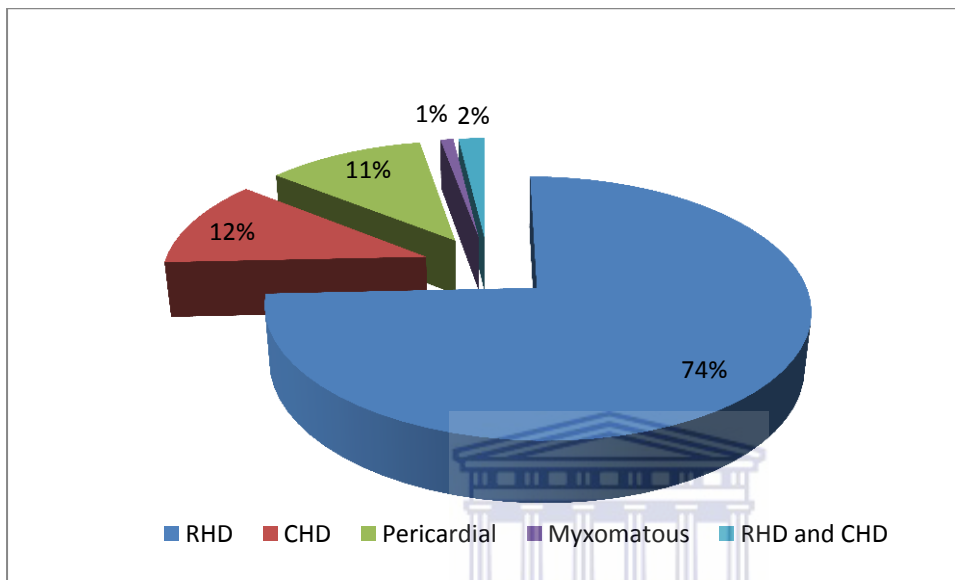
**Table 4.1 Distribution of the selected socio-demographic characteristics of the cardiac surgery patients (n=105)**

Characteristics	Frequency (n)	Percentage (%)
<b>Age (mean=30.64; SD=10.477)</b>		
18 - 22 years	34	32.4
23 - 27 years	16	15.2
28 - 32 years	15	14.3
33 - 37 years	15	14.3
38 - 42 years	9	8.6
43 - 47 years	9	8.6
48 - 52 years	1	1.0
53 - 57 years	5	4.8
58 - 62 years	1	1.0
<b>Gender</b>		
Female	57	54.3
Male	48	45.7



#### 4.2.2 Pattern of cardiac conditions and cardiac surgery

The pattern of cardiac conditions and cardiac surgeries performed for the period under investigation was reviewed and recorded. Figure 4.1 below illustrates the percentages of cardiac surgery patients' diseases among the study sample.



RHD: Rheumatic Heart Disease; CHD: Congenital Heart Disease

**Figure 4.1 Distribution of the patterns of cardiac condition (n=105)**

According to Figure 4.1 above, rheumatic heart disease accounted for the majority of cardiac diseases (74.3%). Congenital heart disease was second (12%) followed by pericardial conditions which accounted for 11%.

In the category of pre-operative diagnosis confirmed by ECG, it was found that a combination of mitral valve disease plus tricuspid valve regurgitation accounted for one third (32.4%). It was also discerned that mitral valve without combination of any other valve disease accounted for 29.5%. The overall findings point out that mitral valve involvement

with or without combination of other valve disease accounted for as high as 71.5% than any other diagnosis confirmed by ECG prior to cardiac surgery as shown in Table 4.2.

**Table 4.2 Distribution of the pattern of cardiac diseases confirmed by ECG (n=105)**

Pattern of disease	Frequency (n)	Percentage (%)
<b>Diagnosis</b>		
MVD plus TVR	34	32.4
MVS	13	12.4
MVD	10	9.5
MVR	8	7.6
Pericarditis	7	6.7
MVD plus AVS	7	6.7
ASD	6	5.7
Pericardial effusion	4	3.8
VSD	4	3.8
AVS	3	2.9
AVR	2	1.9
PDA	2	1.9
MVR, AVR plus TVR	2	1.9
Myxomatous	1	1.0
MVS, TVR plus ASD	1	1.0
Pericardial Cyst	1	1.0

**MVD:** Mitral Valve Disease; **TVR:** Tricuspid Valve Regurgitation; **MVS:** Mitral Valve Stenosis; **MVR:** Mitral Valve Regurgitation; **AVS:** Aortic Valve Stenosis; **ASD:** Atrial Septal Defect; **VSD:** Ventricular Septal Defect; **AVR:** Aortic Valve Regurgitation; **PDA:** Patent Ductus Arteriosus.

It was revealed in this study that the majority of cardiac procedures conducted in a period of four years at MNH had a mitral valve involvement (71.4%) with or without any other heart valve repair. Similarly, a grouping of mitral valve plus tricuspid valve has a sizeable share of the cardiac surgery procedures at 31.4% in 2010 to 2013. Almost 42% of all cardiac patients operated at the hospital had double valve replacement or repair. Also, the surgical procedures pertaining to pericardial accounted for 11.5% as illustrated in Table 4.3.

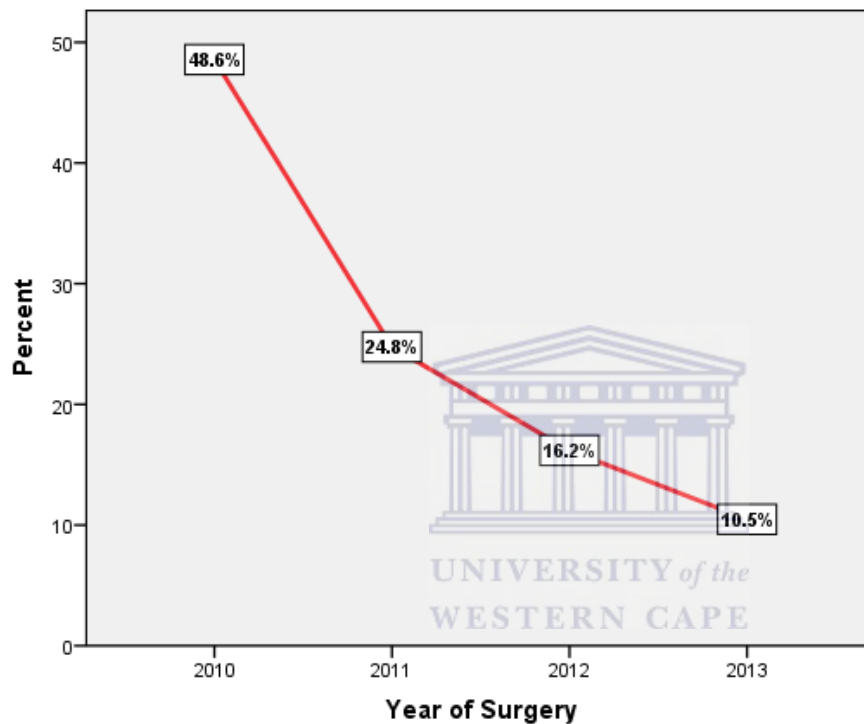
**Table 4.3 Distribution of the patterns of the cardiac surgeries procedures (n=105)**

Type of cardiac surgery	Frequency (n)	Percentage (%)
<b>Procedure (s)</b>		
MV plus TV	33	31.4
MV	31	29.5
MV plus AV	7	6.7
Pericardiectomy	7	6.7
ASD Closure	6	5.7
AV	5	4.8
VSD Closure	4	3.8
Pericardiocentesis	4	3.8
PDA closure	2	1.9
MV, TV, plus ASD	2	1.9
MV, AV, plus TV	2	1.9
Myxomatous Excision	1	1.0
Pericardial Cyst Excision	1	1.0

**MV:** Mitral Valve; **TV:** Tricuspid Valve; **AV:** Aortic Valve; **ASD:** ASD: Atrial Septal Defect; **VSD:** Ventricular Septal Defect; **AVR:** Aortic Valve; **PDA:** Patent Ductus Arteriosus.

### Annual case load of cardiac procedures

Figure 4.2 below demonstrates the annual decline of cardiac surgery procedures performed at MNH. In 2010, 48.6% (51 adult patients) had cardiac surgery. This number decreased yearly to 10.5% (11 adult patients) adult patients by 2013.



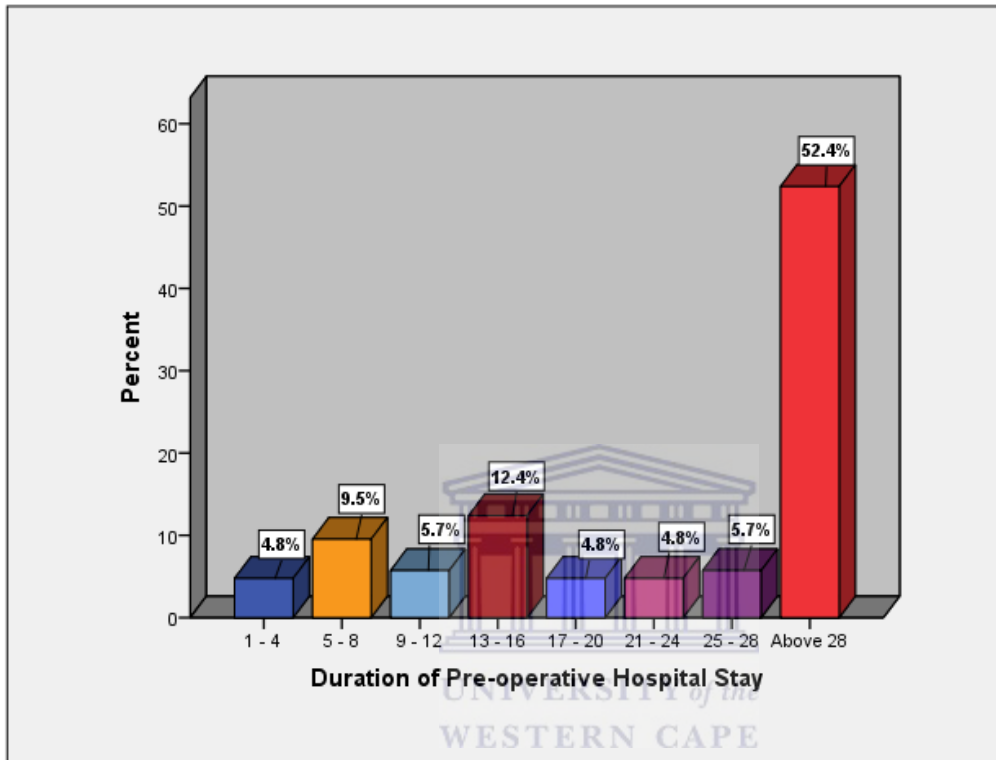
**Figure 4.2 Distribution of the number of adult cardiac surgeries performed in four years (n=105)**

#### 4.2.3 Hospital stay

The hospital stay was recorded for both pre-operative and post-operative phases. The post-operative phase is divided into two, that is Intensive Care Unit (ICU) and post ICU (ward). Figure 4.3 highlights the pre-operative hospital stay: from the admission date to the day of surgery. The mean number of days spent in the pre-operative phase was 38.4 (SD=36.1). The total duration of pre-operative hospital stay is illustrated in Figure 4.3 below which indicates



that more than half of the cardiac patients had a pre-operative hospital stay above 28 days (52.4%). However, almost 14% were operated within one week of their hospital admission.



**Figure 4.3 Duration of the pre-operative hospital stay of cardiac surgery patients at MNH cardiac unit (n=105)**

The mean number of days spent in ICU was 6.4 (SD=5.3). The majority of the cardiac patients (85.4%) stayed in ICU for a period of 8 days. Only 3% of the cardiac patients had prolonged ICU stay for up to 36 days as summarised in Table 4.3. It was also found that a third (33%) of the patients operated on, were discharged from the hospital within 8 days following their admission in the ward. The other 38.8% of the cardiac patients had ward hospital stay of 9 days to 12 days and 13 days to 16 days respectively. The mean number of

post-operative ward stay following cardiac surgery was 12.2 (SD= 7.8) as illustrated in Table 4.3 below.

**Table 4.4 Distribution of hospital stay of cardiac surgery patients**

Post-operative Hospital Stay	Frequency (n)	Percent (%)
<b>Intensive Care Unit (Mean= 6.4; SD= 5.3)*</b>		
1 - 4 Days	40	38.8
5 - 8 Days	48	46.6
9 - 12 Days	8	7.8
13 - 16 Days	2	1.9
17 - 20 Days	2	1.9
21 - 24 Days	0	0.0
25 - 28 Days	1	1.0
29 - 32 Days	1	1.0
33 - 36 Days	1	1.0
<b>Ward (mean=12.2; SD= 7.8)**</b>		
1 - 4 Days	11	10.7
5 - 8 Days	23	22.3
9 - 12 Days	20	19.4
13 - 16 Days	20	19.4
17 - 20 Days	11	10.7
21 - 24 Days	6	5.8
25 - 28 Days	2	1.9
Above 28 Days	2	1.9

\*n=105 as 2 patients died in the operating theatre.

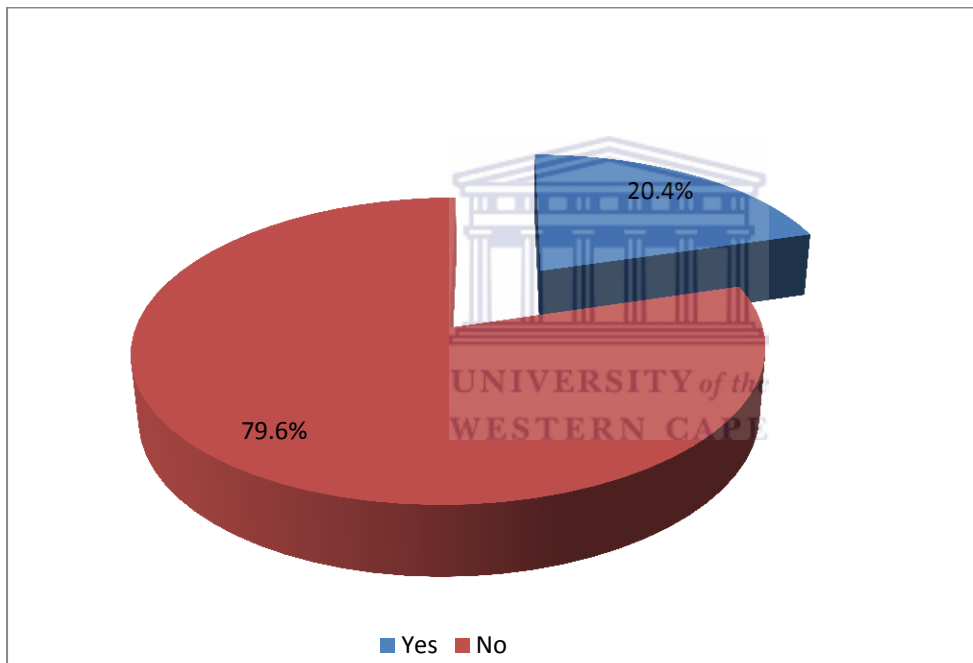
\*\* n=95 as 8 patients died in Intensive Care Unit.

#### 4.2.4 Outcome of management

In this study, the outcome of management is defined as the number of patients who developed post-operative complications, the type of complications and mortality.

##### Post-operative complications

A total of 20.4% (n=21) developed post-operative complications as illustrated in a Figure 4.3 below.



**Figure 4.4 Distribution of the number of the patients who developed post-operative complications (n=103).**

The post-operative type of complications included cardiac arrest (33.3%), pneumonia (19.0%), and septic wounds and Ascites (14.3%) each as summarised in Table 4.5 below.

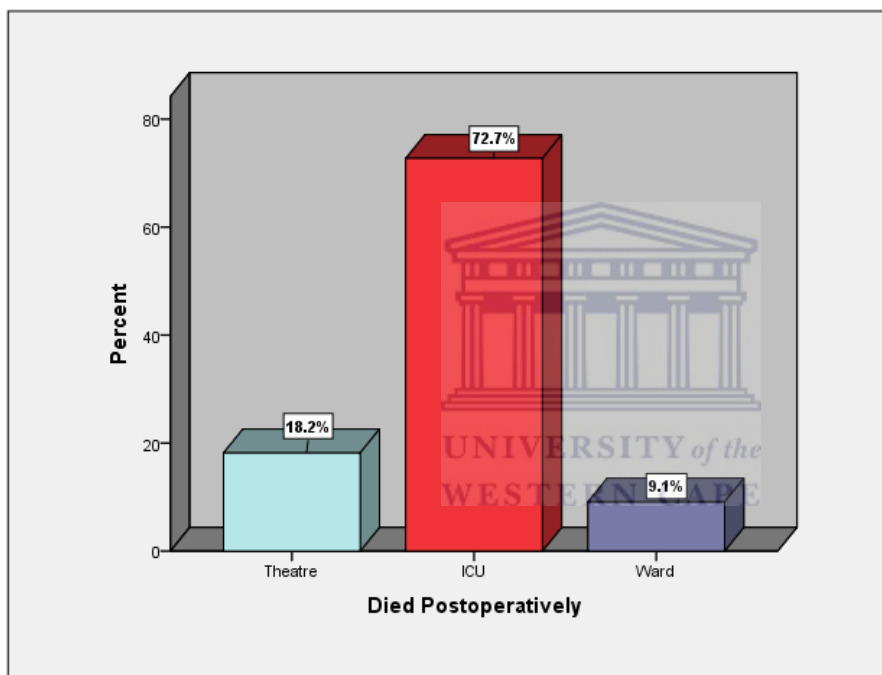
**Table 4.5 Distribution of the post-operative type of complications (n=21)**

Type of complication	Frequency (n)	Percentage (%)
Cardiac Arrest	7	33.3
Pneumonia	4	19.0
Sceptic Wound	3	14.3
Ascites	3	14.3
Hemiparesis	2	9.5
Endocarditis	1	4.8
Lung Collapse	1	4.8



## Mortality

A total of 11 patients died during the period of investigation with a mean hospital stay of 9.4 (SD=12.7). The study recorded a high post-operative mortality of 8 cardiac patients (72.7%) in the ICU as opposed to 2 cardiac patients (18.2%) who died whilst still in theatre. However, 1 (9.1%) adult cardiac patient died in post ICU as shown in Figure 4.5 below.



\*ICU: Intensive Care Unit

**Figure 4.5 Distribution of the post-operative mortality (n=11)**

The summary of the outcome of adults cardiac patients operated at MNH in January 2010 to December 2013 is also delineated in Table 4.5 below.

**Table 4.6 Outcome following cardiac surgery (n=105)**

<b>Patients outcome</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
Discharged home	94	89.5
Died in the theatre	2	1.9
Died in ICU	8	7.6
Died in Ward	1	1.0
Total	105	100

\*ICU: Intensive Care Unit



### 4.3 The process of physiotherapy care following cardiac surgery

This study defines the physiotherapy process of care as the referral to physiotherapy, number of physiotherapy sessions in Intensive Care Unit (ICU) and post ICU, intervals between therapeutic sessions as well as therapeutic content of therapy.

#### Referral for physiotherapy management

Referral in this study is defined as a formal written referral from the Cardiac Surgeon. Only 1.0% (n=1) of the cardiac patients were referred for physiotherapy management pre-operatively while more than three quarters (77.7%) of the patients were referred for physiotherapy management post-operatively. Most of the cardiac patients were referred for physiotherapy management on the first day post-operative (70.0%) as presented in Table 4.7.

**Table 4.7 Distribution of the referral for physiotherapy management (n=105)**

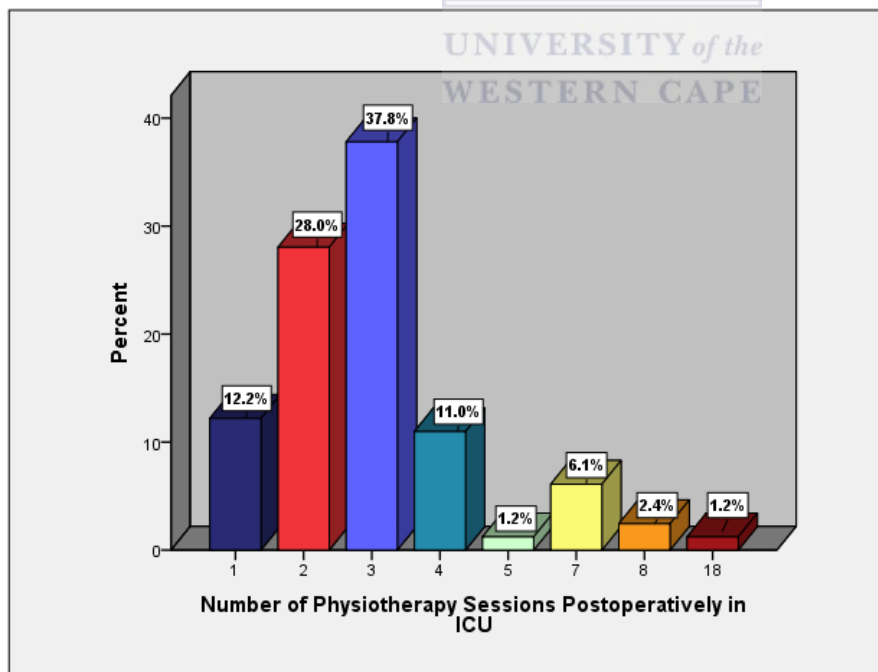
Patients referred	Frequency (n)	Percentage (%)
<b>Pre-operative</b>		
No	104	99.0
Yes	1	1.0
<b>Post-operative*</b>		
Yes	80	77.7
No	23	22.3
<b>Number of Days Referred Post-operative*</b>		
First Day	56	70.0
Second Day	16	20.0
Third Day	4	5.0
After Third Day	4	3.0

\*n=103 as 2 patients died in theatre.

## Physiotherapy treatment

The intervals of physiotherapy treatment sessions were recorded whilst the patient was in ICU and in the Cardiac Ward. Although only 80 formal written referrals were received, Physiotherapists could also treat patients on instruction or referral from Anaesthesiologists.

Of the number of post-operative therapeutic sessions offered in ICU, the mean number of therapeutic sessions cardiac patients received from Physiotherapists were 3.2 (SD=2.3). Over a third (37.8%) of the cardiac patients received 3 therapeutic sessions while 28.1% received 2 therapeutic sessions. However, there were 12.2% of cardiac patients who received the least therapeutic session of 1 from Physiotherapists. It was also revealed that just over a tenth (11.0 %) of patients could receive 5, to 18 therapeutic sessions as shown in Figure 4.6 below.

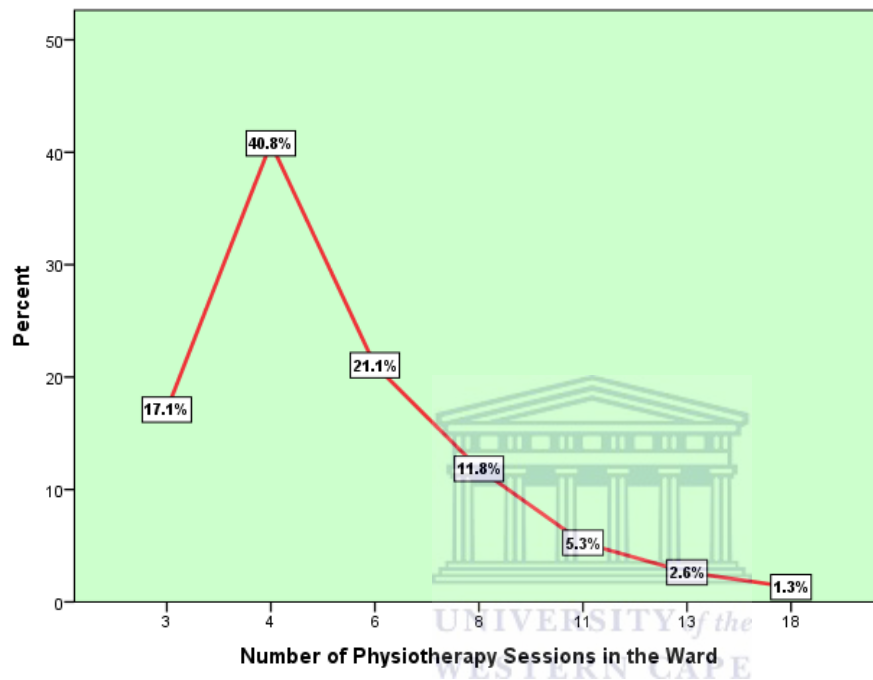


\*ICU: Intensive Care Unit

**Figure 4.6 Distribution of the number of physiotherapy sessions in ICU (n=82)**



The mean number of physiotherapy sessions offered in the ward was 5.5(SD=2.8). Over three quarters (79.8%) of the cardiac patients received up to 6 therapeutic sessions in the ward before being discharged home from the hospital. However, 1.3% of patients received 18 therapeutic sessions as illustrated in Figure 4.7.



**Figure 4.7 Distribution of the number of physiotherapy sessions in the ward (n=76)**

On investigation of the therapeutic intervals offered by Physiotherapists in ICU, 79.3% of the cardiac patients were seen once every day. The remaining 19.5% were attended to on alternate days while only 1.2% received therapeutic sessions twice a day as explicated in Table 4.8.

In the wards, among 82 cardiac patients cardiac patients who were referred to physiotherapy earlier in ICU, only 76 (95%) continued with therapy. Among them, two thirds (65.8%) of the cardiac patients were seen on alternative days, whereas as 32.9% were attended to on a daily basis as summarised in Table 4.8 below.

**Table 4.8 Distribution of the intervals of physiotherapy sessions in the Intensive Care Unit (ICU)**

Therapeutic Intervals	Frequency (n)	Percentage (%)
<b>Intensive Care Unit* (n=82)</b>		
Once a day	65	79.3
Alternative days	16	19.5
Twice a day	1	1.2
<b>Ward* (n=76)</b>		
Alternative days	50	65.8
Once a day	25	32.9
Twice a day	1	1.3

\*Total did not always add up to 80 because Physiotherapists attended 2 more patients after receiving two consultations from Anaesthesiologists.

\*\* Total was 76 because six patients who were referred earlier died in the Intensive Care Unit.

As far as the content of therapy in the ICU was concerned, a combination of breathing exercises, active limb mobilisation, spirometry plus ambulation progressively from the bed accounted for over half (53.7%). Among the 76 (out of 80 referred to physiotherapy) cardiac patients who were moved from ICU to the ward, 89.5% were prescribed with combinations of breathing exercises, active limb mobilisations, endurance training, and posture correction. Breathing exercises were constantly offered in ICU and post ICU to all cardiac patients as shown in Table 4.9.

**Table 4.9 Distribution of physiotherapy content of therapy**

Content of therapy	Frequency (n)	Percentage (%)
<b>Intensive Care Unit* (n=82)</b>		
BE <sup>1</sup> , ALM <sup>2</sup> , Spirometry, AP <sup>4</sup>	44	53.7
BE <sup>1</sup> , ALM <sup>2</sup> , AP <sup>4</sup>	35	42.7
BE <sup>1</sup> , AALM <sup>3</sup> , Positioning	3	3.7
<b>Ward** (n=76)</b>		
BE <sup>1</sup> , ALM <sup>2</sup> , Endurance training, Posture correction	68	89.5
BE <sup>1</sup> , ALM <sup>2</sup> , Posture Correction	6	7.9
BE <sup>1</sup> , AALM <sup>3</sup> , PNF <sup>5</sup> , Balance and Coordination training,	2	2.6

<sup>1</sup>Breathing exercises, <sup>2</sup> Active limb mobilisations, <sup>3</sup> Active assisted limb mobilisations, <sup>4</sup> Ambulation progressively, <sup>5</sup> Proprioceptive neuromuscular facilitations

\*Total did not always add up to 80 because Physiotherapists attended 2 more patients after receiving two consultations from Anaesthesiologists.

\*\* Total was 76 because six patients who were referred earlier died in the Intensive Care Unit.

#### 4.4 Summary

The current study aimed to describe the profile of the patients admitted to the cardiothoracic unit of MNH and their process of physiotherapy care over a period of four years. More than half (54.3%) of the patients admitted for cardiac surgery were females. Rheumatic Heart Disease (RHD) accounted for the majority (74.3%) of the cardiac diseases that lead to cardiac surgery. A decline in the number of surgeries performed were noted from 2010 (48.6%) to 2013 (10.5%). The mean number of days spent in ICU were 6.35 (SD=5.3) and in the ward 12.2 (SD=7.8). A total of 21.4% of the patients developed post-operative complications and 10.5% of the total sample died during the period of investigation.

A considerable number of patients (77.7%) were referred for physiotherapy treatment post-operatively, with most of these referrals on the first day post-operatively (70.0%). The majority (37.8%) of the patients received 3 physiotherapy sessions in the ICU with most of these patients (79.3%) being seen once a day in the ICU and (65.8%) in the ward.

The overall findings will be discussed in Chapter Seven.

## CHAPTER FIVE

### CARDIAC SURGEONS' PERCEPTIONS ON THE ROLE OF PHYSIOTHERAPY

#### 5.1 Introduction

This chapter presents the results of the content analysis of interviews with Cardiac Surgeons on their perceptions about the post-operative role of physiotherapy for the patients that underwent cardiac surgery at MNH. There were four Cardiac Surgeons but two retired early in January 2014, thus the researcher interviewed only the two available Cardiac Surgeons currently working at MNH. Both participants were male with a working experience of 7 years of performing cardiac procedures in Tanzania.

#### 5.2 Pre-determined themes

Interviews were conducted along the lines of five pre-determined themes. These themes included:

- Awareness of physiotherapy
- Role of physiotherapy following cardiac surgery
- Perception of competence of current Physiotherapists
- Motivation for consultation with Physiotherapists
- Suggested improvements.

These themes are outlined and illustrated by means of verbatim quotes. However, two themes emerged during interview. The themes were the history of cardiac centre and frequent type of cardiac surgery performed at the MNH cardiac centre.

### 5.2.1 Awareness of physiotherapy

The efficiency of any team work requires the awareness of other individuals' role in the cardiac multidisciplinary team. In the case of cardiac rehabilitation, there are different health professionals working together to ensure patients full recovery after cardiac surgery. The role of physiotherapy in cardiac rehabilitation has been perceived differently by different health professionals. It was apparent that the educational background of the individual and exposure to physiotherapy had influence on the cardiac surgeons' awareness of physiotherapy as illustrated below by one of the participants.

*“in my teaching I was taught to incorporate a Nutritionist, Cardiologists, Physiotherapist and if a patient is female, you need to include the knowledge of gynaecologist.” ...Cardiac Surgeon 49 years of age*

At MNH, Cardiac Surgeons have shown understanding of the necessity of involving physiotherapy as part of cardiac rehabilitation and as an independent profession. They are aware of what role Physiotherapists play in managing patients though the detail of what is incorporated belongs to the Physiotherapists himself/ herself as illustrated below.

*“Physiotherapy as far as I know, is an independent professional...”  
...Cardiac Surgeon 48 years of age*

*“I know physiotherapy as a profession, as a physiotherapy itself is concerned with...some activities which are done to any patient either to make his / her body function either by making him or her move...using some special instruments.” ...Cardiac Surgeon 49 years of age*

### 5.2.2 Role of physiotherapy following cardiac surgery

Being a Cardiac Surgeon, it is vital to know the role of different professionals in a multidisciplinary team. The ideal is to help facilitate their work by referring the patient to the

right expert at the right time. The participants were aware of what they expected from Physiotherapists in the pre- and post-operative phases of cardiac surgery. During the preparatory stage before surgery, participants comprehended that a therapist intervention is more based on the pulmonary function as the following quotes illustrates.

*“...they have a great role in assessing the pulmonary function of the patient...as you know pulmonary function is the determinant of the post-operative recovery of the patient.” ...Cardiac Surgeon 48 years of age*

The significance of the therapists’ involvement was also conveyed as noted below.

*“Patient in New York Heart Association Clarification four is really a sick patient that he can’t move even ten metres. So if the physiotherapy knows this, he/ she is going to tackle this patient post operatively. So even a post-operative you need to know that this patient was so much sick and you don’t need to move him / her very aggressively.” ...Cardiac Surgeon 49 years of age*

Concerning the post-operative role, participants explained when they expected physiotherapy intervention to the patients. Early therapeutic intervention was needed to improve alveolar gaseous exchange and hence reduce pulmonary complications. This was elucidated in the quotation below.

*“Actually once the patients have been extubated, they should be trained for lung exercises so that the entire alveolar are recruited.” ...Cardiac Surgeon 48 years of age*

The idea of early post-operative therapeutic intervention with regular visits was well thought-out of prominence to the complicated patients as presented in quotations below.

*“Some patients may have complications like lung congestion...they will need to do a lot of lung massage, and chest physiotherapy to make this patient go home comfortably.” ...Cardiac Surgeon 49 years of age*

*“They should be seen frequently post-operatively.” ...Cardiac Surgeon 48 years of age*

### 5.2.3 Perception of competence of current Physiotherapists

Working in the same set up, the participants were asked on how they perceived physiotherapy services in the cardiac centre. Participants described that the service provided in two different phases i.e. the previous phase when cardiac surgery instigated and current situation when this study was conducted.

#### 5.2.3.1 Early Phase

Participants could recall back and as a result remarked that in the beginning Physiotherapists were very obliging in attending to patients, compared to now. One participant said that...

*“Initially when we started; the physiotherapists were very cooperative. But with time, they were disappearing one after another.” ...Cardiac Surgeon 48 years of age*

#### 5.2.3.2 Currently

The surgeons were in agreement that...

*“Physiotherapy is paramount important to our people who undergo heart surgery.” ...Cardiac Surgeon 49 years of age*

Although Cardiac Surgeons applauded physiotherapy, they also identified shortcomings. There were two shortcomings mentioned namely negligence and poor service delivery. The two weaknesses were pin-pointed as follows...

*“I think the work of Physiotherapist is paramount and important but there is an element of negligence.” ...Cardiac Surgeon 49 years of age*

*“I should say we have very poor service for Physiotherapists in our unit.” ...Cardiac Surgeon 48 years of age*



## **Reasons for the poor physiotherapy services in the unit**

From the participants' perspective, there are a number of contributing factors for these identified shortcomings.

### **i. Motivation**

It is perceived by the Cardiac Surgeons that Physiotherapists lack motivation. This affects performance in providing quality service to the patients as quoted below.

*“And this has happened because they tend to realise that they were just wasting their time. There was no motivation, no incentive in the unit so they try to look any other business especially in their unit and not in the cardiac unit.” ...Cardiac Surgeon 48 years of age*

On the other hand, there is an impression that therapists focus too much on the incentives as illustrated below...

*“Sometimes people they just think about money but not a service.” ...Cardiac Surgeon 49 years of age*

*“I know Physiotherapists could have been here but I think the problem is the motivation on the payment. They are not motivated those who are in the general Physiotherapy Department to come and do physiotherapy activity in our Unit.” ...Cardiac Surgeon 49 years of age*

One participant was quoted below arguing that focus should not be on money or incentives...

*“...Concentrate to do a volunteer job to save the life of these kids or for our patients.” ...Cardiac Surgeon 49 years of age*

### **ii. Lack of trained personnel**

Another factor which was perceived to negatively affect physiotherapy services in the unit is lack of trained and resident Physiotherapists in the Cardiac Unit. Respondents are in agreement that...

*“For the time being we don’t have physiotherapist in cardiac surgery...currently we got nobody who is really trained pertaining cardiac surgery. I mean in our unit who can do this job.” ...Cardiac Surgeon 49 years of age*

*“No really Physiotherapist who is entitled or is throughout actually taking care of those patients both pre-operative and post-operative. I mean that, a Physiotherapist who is exclusively working in the cardiac unit.” ...Cardiac Surgeon 48 years of age*

#### **5.2.4 Motivation for consultation with Physiotherapists**

At the MNH cardiac unit, Cardiac Surgeons also considered involvement of physiotherapy pre-operatively. Their primary reasoning was that pre-operative consultation would help therapists to get in touch with the patient and discuss their post-operative plans. It is the perception of surgeons that they do not have to write another consultation post-operatively. The quotations below best represent their views.

*“We consult Physiotherapist pre-operatively...so it is the duty of Physiotherapist to know that I have seen this patient pre-operatively, when is he / she going to be operated and then follow the course.”...Cardiac Surgeon 49 years of age*

*“We write pre-operative consultation to Physiotherapist when we really want to assess the pulmonary function of the patient. We want to know the lung function capacity of the patient which actually is the determinant of the post-operative recovery of the patient.” ...Cardiac Surgeon 48 years of age*

The emphasis of involving therapists pre-operatively is on pulmonary function assessment as expounded in quotations below...

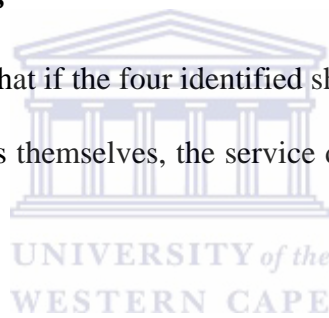
*“...where especially we need to assess the operability of the patient.” ...Cardiac Surgeon 48 years of age*

On the other hand, one Cardiac Surgeon discussed the weakness on their side whereby Physiotherapists were less involved in both pre- and post-operative phases as distinguished below...

*“Previously we couldn’t invite Physiotherapists but now we invite them pre-operatively to see the patients. Previously we used not to consult Physiotherapist pre-operatively. But after getting some mortalities and very poor recovery post-operatively; but for the last one year, I think they have become part and parcel of all procedures.” ...Cardiac Surgeon 49 years of age*

### **5.2.5 Suggested improvements**

The two participants anticipated that if the four identified shortcomings could be improved by management and Physiotherapists themselves, the service delivery could also improve in the unit.



#### **i. Administration**

One participant called for the hospital management to recognise physiotherapy as an independent profession in many aspects. He further said...

*“The higher authority...the administration should consider physiotherapy as a special profession.”  
...Cardiac Surgeon 48 years of age*

#### **ii. Motivation**

The participant also made a suggestion to the hospital management to also motivate Physiotherapists like any other health professionals in the area of cardiac surgery. More so, the participant stressed that...

*“Give them all the motivation and kind of incentive so that they are motivated to come and do the work in the unit.” ...Cardiac Surgeon 48 years of age*

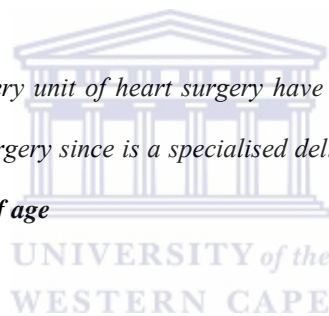
### iii. Training

Another emerged suggestion was to train more therapists in the area of pulmonology. This is well explicated in a quotation below...

*“They should be trained more on pulmonology, lung recruitment for patients because it has a great role in alveolar recruitment which is very important in gaseous exchange. So they should really know lung they should know much about lung functions and how to manoeuvre those, so that the alveolar are recruited for gaseous exchange.” ...Cardiac Surgeon 48 years of age*

Training is further suggested to cover all sub-units of Cardiac Unit as it was stated by one participant that...

*“I think it will be better if every unit of heart surgery have its own trained people in physiotherapy especially concerning heart surgery since is a specialised delicate profession. This is what I can say.”  
...Cardiac Surgeon 49 years of age*



### iv. Physiotherapists

From the perspective of Physiotherapists working in the MNH cardiac unit, participants wished to be permanently stationed Physiotherapists in the complex, who will be accessible whenever required to provide service. This is complimented by the statement from the participants own sentiments as illustrated below...

*“We must have somebody who is committed with his work and he need to help patients who are planned for operation and those who have been operated.” ...Cardiac Surgeon 48 years of age*

*“So I think we need to have physiotherapy in a pre-operatively, post operatively and in early post operatively period whenever the patient is coming or visiting the hospital.” ...Cardiac Surgeon 49 years of age*

## v. Working environment

Currently there is no physiotherapy sub unit in the MNH cardiac unit. Participants remarked on this, and their perceptions are documented below...

*“I think the architecture overlooked the role of Physiotherapist in this building. Otherwise we don’t have proper place for physiotherapy and we don’t have somebody meant for cardiothoracic physiotherapy patients.” ...Cardiac Surgeon 49 years of age*

The following suggestion was made...

*“I should say that, they should be given a place or a room if this was not planned prior. They should be given a room where they can keep their equipment.” ...Cardiac Surgeon 48 years of age*

## 5.3 EMERGERGED THEME

### 5.3.1 History of cardiac centre

After all pre-determined themes, the participants gave a brief history of MNH Cardiac Unit as illustrated below.

*“Our cardiac centre started back in 2008 mid of August.” ...Cardiac Surgeon 49 years of age*

*“Cardiac started after government selected a task force of a total of 27 staff (Cardiac Surgeons, Anaesthesiologists, Biomedical engineers) who were all identified and sent to India. There were no Physiotherapists though while the team was there, we suggested to get Physiotherapist but this never matured.” ...Cardiac Surgeon 48 years of age*

The trend of cardiac surgery has been reported to drop yearly due to a number of reasons including politics, lack of facilities and others as illustrated below by one participant:

*“For the years 2008, 2009, 2010, and 2011 we were doing 100 patients per year. But since 2012 to date, the number has gone down because of political issues, lack of consumables, and some due to*

*academic reasons. We did not operate much and I think by 2013 to date we didn't even operate more than ten patients. So this is all about our centre.”...Cardiac Surgeon 48 years of age*

The challenge of shortage of Cardiac Surgeons as well emerged as follows:

*“And we had four Cardiothoracic Surgeons but two of our colleagues retired. They became pensioners so we remained two. You can imagine a population of 45 million people to depend on two Cardiothoracic Surgeons is a kind of difficult. One retired at 55 years old and the other at 60 years old this January.”...Cardiac Surgeon 49 years of age*

### **5.3.2 Types of cardiac surgery**

The MNH Cardiac Unit performs different types of cardiac surgery as mentioned below:

*“All types of cardiac surgeries including valvular heart disease, Congenital Heart Disease such as VSD, TOF, ASD, PDA. We have not started CABS's but we have plan for it. Currently we have started cartlab.”...Cardiac Surgeon 48 years of age*

*“Majority we do congenital cases like ASD, VSD, we do valve replacements, valve repairs, we do vascular cases like aneurisms, but we also do some PDA closure. These are mains. We are looking forward to do CABG in future.”...Cardiac Surgeon 48 years of age*

It was also mentioned by one participant that there are some patients who present with complex or multiple conditions, who are still referred abroad. The conditions referred are elucidated in a quotation below:

*“Yes, we refer those patients with complex congenital diseases, CABG's, and thoracic aneurysms. Those are majority of patients....Cardiac Surgeon 48 years of age*

#### **5.4 Summary**

The perceptions of Cardiac Surgeons on post-operative role of physiotherapy have been presented in this chapter. The pros and cons of physiotherapy have been documented and so have the areas of improvement and the positive measures to be taken. It is in this regard that the pre-determined and emerging themes will be further deliberated in Chapter Seven of the discussion. Finally, conclusions and recommendations will be presented.



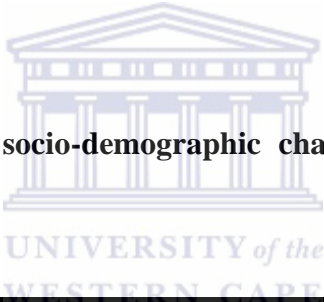
## CHAPTER SIX

### PERCEPTIONS OF PHYSIOTHERAPISTS

#### 6.1 Introduction

This chapter presents the perceptions of Physiotherapists regarding post-operative management of patients following cardiac surgery at MNH. Table 6.1 below summarises the ages and years of experience as a Physiotherapist and years of experience at MNH. The majority of the participants (70%) were male and 30% were females. The number was not limited to ten but the interviews reached data saturation point. Saturation point is the point whereby there is repetition of themes and the information gathered earlier (Polit & Beck, 2004).

**Table 6.1 Distribution of the socio-demographic characteristics of the respondents (n=10)**



Variable	Mean	Standard Deviation (SD)
Age	44.1	8.7
<b>Experience:</b>		
General	19.0	8.9
At MNH*	13.4	8.8

\* Muhimbili National Hospital

#### 6.2 In-depth interviews

Interviews were conducted along the lines of five pre-determined themes. These themes encompassed:



- Role of physiotherapy
- Consultation with the Cardiac Surgeons
- Process of care
- Challenges experienced
- Suggested improvements

These five themes are delineated and epitomised by means of verbatim quotes from ten Physiotherapists who were interviewed.

### 6.2.1 Role of physiotherapy

Physiotherapists had shown to understand their role in cardiac surgery. This is important in maintaining the standard of profession while performing regular procedures. The researcher enquired from therapists about their role in cardiac surgery and cardiac rehabilitation at large. With few who were hesitant, participants described the role of physiotherapy in both pre- and post-operative phases of cardiac surgery until reclamation. Facilitation of health recovery, reducing chances of developing pulmonary complications and enhancing optimal function are roles which appeared from the participants, as indicated below in quotes:

*“What I know the role of physiotherapy in Cardiac surgery is...to make these patients improve and to have a quick recovery after the surgery and to return to his normal optimal function independently.”*

*...Physiotherapist P<sub>1</sub>*

*“Physiotherapist role in the cardiac management is just to promote healing.” ...Physiotherapist P<sub>2</sub>*

*“Physiotherapy role in cardiac surgery management is to improve or facilitate the healing process.”*

*...Physiotherapist P<sub>4</sub>*

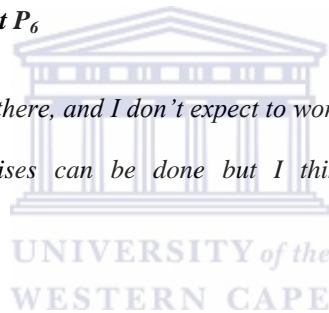
*"Actually the role of physiotherapy in cardiac surgery is to help individuals whom are about to undergo cardiac surgery or whom have undergone surgical interventions following a different problems related to their heart conditions. Yeah that's all I can say." ... Physiotherapist P<sub>10</sub>*

The seven participants described the role of physiotherapy with self-reliance. However, three participants showed hesitation of what they knew about the physiotherapy role in cardiac surgery.

*"I can't say much on cardiac rehabilitation because I am not positioned there..." ...Physiotherapist P<sub>2</sub>*

*"Anyway I know little the role of physiotherapy in cardiac patients as far as pre- and post-operative treatment is concerned. I think is to hasten the patients' recovery and also to prevent some complications that might arise after surgery. For this reason I think pre- and post-operative treatment is essential." ...Physiotherapist P<sub>6</sub>*

*"...I have never been working there, and I don't expect to work there. Therefore I didn't have any time to read what kind of exercises can be done but I think aerobics might suit the purpose." ...Physiotherapist P<sub>8</sub>*



### **i. Pre-operative Role**

Participants coded that their pre-operative role is aimed at preparing the patient for surgery, i.e. to educate the patient on how to maximise physical activities without causing pain post-operatively, and to get in touch to the patient as they get to know each other. In addition, participants were quoted saying that in this phase, the therapist describes to patient what he / she will be doing post-operatively and the significance of it.

*"Pre-operative physiotherapy plays part in preparation of patients to go to the surgery. First is education on how patient will cope with the pain. And how can patient maximise activities after surgery because after surgery." ...Physiotherapist P<sub>1</sub>*

*“Pre-operative physiotherapy role...will help patient post-operative to know how to breathe properly, cough and position himself in order to reduce pain.” ... **Physiotherapist P<sub>2</sub>***

In this stage therapist orient patient on what exercises and activities to be performed shortly after surgery as documented in a quotations below.

*“In pre-operative is that you educate the patient on the awareness to various procedures that you will use to prevent post-operative complications.” ... **Physiotherapist P<sub>6</sub>***

*“...teaching patient exercise to make him remember after the operation.” ...**Physiotherapist P<sub>9</sub>***

*“...patient has to be oriented with the activities which are supposed to be done post-operative.”  
...**Physiotherapist P<sub>8</sub>***

Therapists added that in the pre-operative phase patient is educated on various aspects, including the significance of exercises on the effects of general anaesthesia to the airways.

The researcher noted the following:

*“The pre-operative we also teach...about the effect of general anaesthesia on a respiratory way or pathway, cilia and bronchi itself, the mechanism of cilia with medication they are given.”  
...**Physiotherapist P<sub>3</sub>***

*“To assist the overcoming effect of anaesthesia as quickly as possible, also to maintain full muscle power and full joint range, also to assist the speed of recovery.” ...**Physiotherapist P<sub>6</sub>***

Endurance and functional ability of the patient were correspondingly stated to be part of pre-operative assessment. They are part of the outcome measure which could be used post-operatively to assess if the patient is improving or is deteriorating by assessing their pre-operative functional ability. All participants were in agreement on this as quoted below.

*“It is vital we know the endurance and how much the heart work before surgery.” ...**Physiotherapist P<sub>1</sub>***

*“...to know the exercise after surgery they have to perform and also to assess the endurance and capacity or the strength of the patient.” ...Physiotherapist P<sub>7</sub>*

Participants also were in agreement that:

*“It’s normally good to prepare someone whom will undergo surgery that involves opening of a chest which involves a lot of disturbances to the normal functions of the heart and the lungs...requires some training so that can cope with the breathing and controlling the individual posture. All these things must be trained so that the individual do not fall into anxiety and can have a better functioning after surgery.” ...Physiotherapist P<sub>10</sub>*

## **ii. Post-operative Role**

Promoting individual optimal functional level of independence is considered by the majority to be a main goal of this phase of intervention. Participants recommended pre-operative intervention. This is illustrated below in quotations.

*“After surgery we prepare patient for normal circumstances.” ...Physiotherapist P<sub>4</sub>*

*“...we focus on the preparation of the patient to go to the optimal function of activities which he had before.” ...Physiotherapist P<sub>1</sub>*

*“Therefore pre-operative is more important to facilitate post-operative physiotherapy in cardiac surgery.” ...Physiotherapist P<sub>8</sub>*

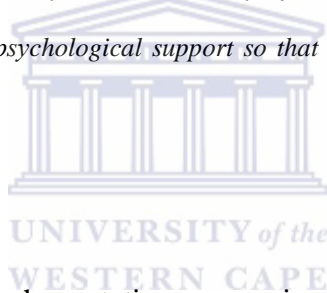
It came clear that clearance of airways and restoration of the function to previous level of function before surgery is of utmost significant while the patient is still admitted to the hospital. It was also elucidated that:

*“Physiotherapy also is essential to patients who had undergone cardiac surgery which will help the patients to clear the chest airways, lung airways, to restore the functions, and to restore the endurance. That’s what I know.” ...Physiotherapist P<sub>5</sub>*

*“...continue with what you have established in the pre-operative management. So you can train an individual to become independent as much as possible. Help them to reduce fear, because fear sometimes interfere with breathing so it is important thus they breath very well so that the tissues and the recovery becomes very good for the health of the individual.” ...Physiotherapist P<sub>10</sub>*

Patients require psychological support from the medical team post-operatively. It was elucidated by participants as quoted below that if these patients are not getting involved in physical activities, they could succumb to dependence to the family or postural complications.

*“The psychological support of the physiotherapy is to encourage the patient to move out of bed, to be active as before and to ensure them that they can correct their posture themselves because most of the time the patients after surgery they have a tendency of bending and rotating toward the incision area...they afraid...give them psychological support so that they can be aware of what they have to do.” ...Physiotherapist P<sub>7</sub>*



Prolonged lying in bed could bring hypostatic pneumonia and other pulmonary complications and so increase hospital stay. Early ambulation could help reduce the chances of these complications. This is one of the primary roles of physiotherapy post-operative as indicated below:

*“The post-operative role will help patient to quickly come out from prolonged lying on the bed.”  
...Physiotherapist P<sub>2</sub>*

Though the post-operative role of physiotherapy has been identified by many participants, two participants were not acquainted with post-operative role as exemplified below:

*“...in other words you prepare patients for home discharge. I have not worked much with cardiac patients so it's just that I know.” ...Physiotherapist P<sub>6</sub>*

*“Of course I am not familiar with post cardiac surgery so long as I have never been working there but generally I could say, something special is to make sure that the heart is functioning well as it has been functioning before the operation.” ...Physiotherapist P<sub>8</sub>*

## **6.2.2 Consultation with the Cardiac Surgeons**

In MNH cardiac unit, communication among health practitioners is through patients’ files. The Cardiologist, Cardiac Surgeon, Anaesthesiologists, other medical practitioners and Physiotherapist, all communicate through writing notes on the patient’s folders. Nurses are responsible for the coordination of all the information written in the file. The Rehabilitation Department, where the Physiotherapy Unit is situated, is slightly distant from the Cardiac Unit. Therefore, whenever there is a consultation, there are different ways of communicating with the responsible Physiotherapists, predominantly telephonically, as outlined by the participants below.

*“We have three ways of communications, either there is a consultation sent to physiotherapy by the nurses or by the telephone. They call physiotherapy by telephone.” ...Physiotherapist P<sub>6</sub>*

*“They can phone or write a consultation to physiotherapy.” ...Physiotherapist P<sub>9</sub>*

However, if there is no consultation written, a participant enlightened that:

*“In reality it is very difficult to get the patients pertaining cardiac issues if there is no consultation.” ...Physiotherapist P<sub>5</sub>*

### **ii. Pre-operative versus Post-operative consultations**

Six participants’ perceived that there is a challenge in their pre-operative involvement. With a lot of feeling as researcher observed, participants were quoted saying that...

*“What I see at Muhimbili, patients are only seen post operatively. They are not seen pre operatively. Imagine you don’t know the patient, and you see him or her post operatively, it becomes a challenge*

*because you don't know previous diagnosis and functional abilities of the patients before surgery which could be compared after surgery to know the prognosis of the patient...But you can find that, the surgeon calls Physiotherapist post operatively when patient get deep breathing difficulties, weakness due to prolonged immobilisation, coughing, inability to ambulate her or himself and chest complications. That is where we are involved much but pre operatively, we are normally not being involved.” ...Physiotherapist P<sub>1</sub>*

*“As far as I know, most of the physiotherapy involvement comes post operatively whereby they are called to do physiotherapy management. But pre-operative physiotherapists are not involved much.”  
...Physiotherapist P<sub>2</sub>*

*“They most consult physiotherapist two days post-operative, others 1st day post-operative. It depends on the stability of the patient. Sometimes up to five days post-operative. Most of the surgeons, they don't consult physiotherapy pre-operative. They consult post-operative.” ...Physiotherapist P<sub>7</sub>*

*“In this hospital...when they see there is complication, that's where they write consultation...some patients they develop oedema of the lower limbs post operatively because they were not taught to do even pumping exercises of the feet. That is the first complication which will end up with sometimes emboli.” ...Physiotherapist P<sub>9</sub>*

*“...most of the time after operations that's when it is indicated in the file that this patient requires physiotherapy...sometimes there is no consultation, direct consultation for physiotherapy but sometimes is just written in the file but is not exactly said that this has been consulted to physiotherapy...there is no direct consultation from surgeons to physiotherapist.” ...Physiotherapist P<sub>10</sub>*

However, other four participants argued that there are more pre-operative consultations than post-operative consultations. They further added that once Physiotherapist has received pre-operative consultation, it is his/ her duty to do a follow up of the patient post-operatively. The researcher illustrates these views in quotations below.

*“The Cardiac Surgeons do refer to us those patients who are planning to operate. We go there, assess and conduct pre-operative sessions to those patients. Then we keep following them after the operation for exercises daily.” ...Physiotherapist P<sub>3</sub>*

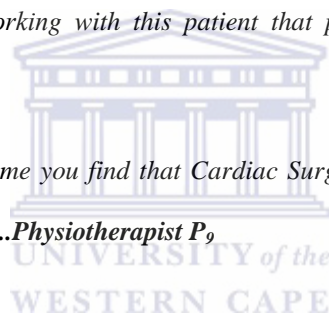
*“In post-operative, there is no problem that much compared to pre-operative because post-operative patients you will find that they have already started being seen by Physiotherapist before undergoing surgery. So it will be the continuation after surgery. So there will be no interdepartmental consultation after that and mind you, I have told you that there is a person who is responsible for the cardiac patients. So it is his / her duty to make sure that this patient will proceed with treatment in charge.”*

*...Physiotherapist P<sub>5</sub>*

*“...those patients or some patients we have seen them before the operation, so you know the patient ‘X’ will be operated in a certain day, so usually after surgery...if there is something or question, they will let you know when you’re working with this patient that please pay precautions on AB and C.”*

*...Physiotherapist P<sub>6</sub>*

*“...but of course most of the time you find that Cardiac Surgeon whenever he want to do operation; he...consult Physiotherapist.” ...Physiotherapist P<sub>9</sub>*



#### **iv. Ward Rounds**

At MNH, there are two different ward rounds i.e. Service ward round, which is daily, and major ward round which is up to three times a week. Physiotherapists are part of major ward rounds. Therapists were quoted below explaining the significance of them being in a major ward round.

*“...when they see the Physiotherapist in the ward round, they can tell the Physiotherapist that there is patients.” ...Physiotherapist P<sub>1</sub>*

*“...we meet them in the ward round.” ...Physiotherapist P<sub>4</sub>*

However, it was brought out by one participant quoted below that the major ward rounds are being conducted in the morning hours. Physiotherapy participation in the ward round is a challenge as in the morning; they are busy with out-patient clinic.



*“But it is difficult to participate in ward round when you have other patients in other wards or out-patient clinic.” ...Physiotherapist P<sub>4</sub>*

## **v. Written Consultation**

Interviewed therapists were quoted in contention that...

*“...with the Anaesthesiologists, I think they are comfortable with physiotherapy and sometimes they recommend physiotherapy, continue with physiotherapy and such things.” ...Physiotherapist P<sub>10</sub>*

*“Usually they write consultation note. This note will be written by doctor from Cardiac Unit. On the patient note, there is diagnosis, brief information on what has been done to the patient and what has developed. Just a brief note explaining to you so that at least you get the idea before going there, knowing this is the patient I am going to see.” ...Physiotherapist P<sub>6</sub>*

*“As far as I know there is a special consultation which has been written by the Cardiologist to consult Physiotherapist. That is the regime of the hospital. Post-operative, the Cardiac Surgeon should consult the Physiotherapist to intervene. And thereafter, Physiotherapist should assess and see where his role falls does and then intervene according to his findings.” ...Physiotherapist P<sub>8</sub>*

*“What I see is like the Anaesthesiologists most of the times are found in the ICU. And we sometimes do round with them and we talk about patient with them.” ...Physiotherapist P<sub>10</sub>*

However, two participants who were uncertain mentioned that...

*“I am not very clear if they write consultation because the issue for cardiac is different from other wards. It does not involve other routines like other wards whereby they have to write a consultation to Physiotherapist.” ...Physiotherapist P<sub>2</sub>*

*“What I have seen most of the time, consultations is normally not much written.” ...Physiotherapist P<sub>1</sub>*

## vi. Phone Consultation

Sometimes the communication between the Cardiac Unit and the Physiotherapy Department is telephonic. It was also eminent that:

*“For communication, they use phones sometimes they bring files from cardiac unit.”*  
...**Physiotherapist P<sub>4</sub>**

*“What I know here in MNH they just call...”* ...**Physiotherapist P<sub>3</sub>**

*“What I can see is, they just call post-operative...but they do consultation by phones. But we normally don't see any consultation notes in the files.”* ...**Physiotherapist P<sub>1</sub>**

*“When they need Physiotherapist, they can call from the ward...”* ...**Physiotherapist P<sub>4</sub>**

## vii. Response to consultation

The responsible person to communicate information received from the doctor is a nurse. However, if the nurse does not communicate, it causes a delay of information transfer, and so the Physiotherapist will not be able to attend to the patient within a specified time. This was agreed by most participants as noted below.

*“They write consultation and they give to the nurses responsible to the cardiac surgery wards.”*  
...**Physiotherapist P<sub>8</sub>**

*“A nurse makes a call to Physiotherapy Department if they have received a note from Doctor that there are patients who need physiotherapy.”* ...**Physiotherapist P<sub>3</sub>**

Participants remarked on their response to the different types of consultations as delineated here under in quotations.

*“Most Physiotherapists because they are after the patients, they respond well...We are flexible regardless of the type of consultation received whether it is phone or the doctor found you crossing the ward and tell you that there is patient, we just respond to it.”* ...**Physiotherapist P<sub>1</sub>**

*“After receiving consultation, the Physiotherapist located to the cardiac surgery ward takes the responsibility.” ...Physiotherapist P<sub>8</sub>*

Participants revealed below that they do respond to the consultations within 12 to 24 hours on weekdays but in case of emergency, they respond immediately.

*“There is what they call emergencies and routine consultations. If it is emergency consultation, we have to respond immediately within an hour to see the patient. If it is routine, we can even take one day. It depends with the patient.” ...Physiotherapist P<sub>9</sub>*

*“Principally we have a policy which guides us on how to respond to any kind of consultation whether it is formally or informal. We normally respond within 24 hours in week days depending on the situation of the patient like in cardiac ICU or general Cardiac Ward. In Cardiac ICU we respond quickly than in a normal ward. In normal wards, it takes 24 hours but in ICU we respond immediately after the call. For the case of emergency, they normally call the head of department to find someone who can take care of that emergence. So if Physiotherapists are told that there is an emergence, they respond quickly normally.” ...Physiotherapist P<sub>1</sub>*

*“The response of the Physiotherapist to the consultation is as soon as possible.” ...Physiotherapist P<sub>2</sub>*

*“Consultation we are supposed to respond not more than 12 hours. Consultation should be answered.” ...Physiotherapist P<sub>3</sub>*

*“Of course we respond immediately by going there and meet the patient. It's within 12 hours.” ...Physiotherapist P<sub>8</sub>*

*“We respond within 24 hours after consultation.” ...Physiotherapist P<sub>4</sub>*

*“We try our level best to respond to the consultation promptly it means immediately...within 24 hours of arrival.” ...Physiotherapist P<sub>4</sub>*

*“Usually consultations are responded within 12 hours after consultation.” ...Physiotherapist P<sub>6</sub>*

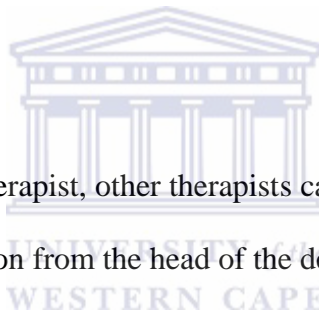
### **viii. Stationed Physiotherapist in MNH Cardiac Unit**

Participants were not clear if a Physiotherapist is stationed in the Cardiac Unit or an allocated Physiotherapist, but different participants argued on this matter with different opinions. So they said:

*“The cardiac issue is always handled different from other wards as there is stationed Physiotherapist in a Cardiac Department so there is mutual communication which is direct goes to the concerned Physiotherapist...the communication is just with the concerned Physiotherapist in that cardiac unit.”*

*...Physiotherapist P<sub>2</sub>*

*“...there is a responsible Physiotherapist who his main role is to deal with those patients in the cardiac unit. So if there are patients, that particular Physiotherapist there is aware of those patients.”...Physiotherapist P<sub>3</sub>*



In the absence of this allocated therapist, other therapists can also take responsibility to attend to a consultation through delegation from the head of the department as explicated below.

*“If the responsible Physiotherapist is not around, the head of department chooses any Physiotherapist to attend those patients on behalf of responsible one who is not around. So anyone can attend patients in Cardiac Unit.” ...Physiotherapist P<sub>3</sub>*

*“...but if they are not around, we do under supervision. Almost all of us are aware of cardiac surgery as I learnt cardiac surgery through seminars and at school.” ...Physiotherapist P<sub>4</sub>*

*“The head of department has to look for someone to be responsible to look someone to take over the charges. But that were the problem comes because we only have one Physiotherapist allocated in Cardiac Unit. Because not all who have interest in working with cardiac patients. Therefore you look for anyone who have the interest of serving the purpose. We have some who have interest although they don't have any training but we expose them as long as they have interest to go and do whatever they can do in absence of the person allocated to the ward.” ...Physiotherapist P<sub>8</sub>*

## ix. Documentation

Following consultation, therapists reported that documentation is a vital part of communication among health workers. In the Cardiac Unit, anything not documented is regarded as not done. Physiotherapists expounded below on how they communicate to doctors through files. Name, time, date and signature of the person are of importance.

*“We normally have to document. After being consulted, we go there to Cardiac Department, take patient file, read then find the Doctor’s note to physiotherapy then respond to it by writing my findings, what I saw both positive and negative, what I did to the patient, my evaluation after treatment, recommendations if any, my name and date of attendance. Then I can sign...we communicate to Doctors through writing notes in the patient file...” ...Physiotherapist P<sub>3</sub>*

*“We go there, meet the patients, assess, write down the findings, and actual plan. After intervention, you have to jot down the achievement. You should jot down as a response to the consultation brought to you.” ...Physiotherapist P<sub>8</sub>*

However, one participant disputed that:

*“There is no such kind of a reply since there is no direct consultation but for that case...we does communicate in the files just a normal way we are reporting the patient information.” ...Physiotherapist P<sub>10</sub>*

Three participants concurred with this statement, that instead of only relying on documentation in the files as the only way of communication, there is also direct communication between Physiotherapist and doctors as epitomized below.

*“...if you want to emphasize something, you can talk to Doctor himself.”...Physiotherapist P<sub>3</sub>*

### 6.2.3 Process of care

Physiotherapy intervention in a process of care is divided into different phases of cardiac rehabilitation as indicated below in subheadings.

#### i. Pre-operative

In this phase, all participants were in agreement that:

*“We can prescribe breathing exercises. This includes deep breathing exercises, huffing – coughing, upper limb exercises like butterfly and we can also conduct walking exercises. Six minutes walking test can also be part of pre-operative as a tool test and also an exercise. We can also use stair climbing exercises to see if patient are capable. Education about...the effect of anaesthesia and the outcome of operation.” ...Physiotherapist P<sub>3</sub>*

*“...breathing exercises, chest expansion, huffing and coughing.” ...Physiotherapist P<sub>4</sub>*

*“Chest exercises, we do exercise to maintain lung capacities, mobility exercises of the joints, muscles and we try to maintain exercise tolerance of the patient. That’s the main exercises.” ...Physiotherapist P<sub>5</sub>*

*“Deep breathing exercises, butterfly exercises, walking, climb stairs, those strengthening exercises, huffing and coughing. You have to teach patient how to use spirometer.” ...Physiotherapist P<sub>7</sub>*

*“...mainly breathing exercises, observation of the posture and issues concerning endurance that this patient have to have certain abilities to sustain activities without too much exhaustion...two minutes walking test, and...Stairs climbing test.” ...Physiotherapist P<sub>10</sub>*

#### ii. Post-operative

##### Postoperative (acute) in ICU

It was revealed that, in acute stage, the therapist must be careful in what they prescribe to the patient. This is well corroborated in quotes of the participants below.

*“After surgery we normally treat them with active circle of breathing, deep breathing exercises, pumping exercises to the lower limb and positioning. To position patient to the comfortable anatomical position that can minimize pain with the bed slightly elevated to facilitate breathing.”*

*...Physiotherapist P<sub>1</sub>*

*“Upper limb movements, clearing of the mucus, frog exercises, assisted active chest mobilisation for clearing mucus, and also breathing exercises. Because it is acute, it should not be full active but assisted actively.” ...Physiotherapist P<sub>2</sub>*

*“The initial days we prescribe lower limb exercises like pumping exercises starting from the lower limb to upper limb. Then breathing exercises which depends also to the condition of the patient if can tolerate. Those are the exercises for first day. The second day you can start with ambulating the patient within a bed for bed making, the patient into seating position continue. Exercises to the extremities for the sake of improving circulation but it depend on vital signs. Then you can take patient out of bed for ambulation depending on the ability or capability of coping with those exercises or depends with patients condition generally.” ...Physiotherapist P<sub>3</sub>*

*“Chest exercises which will enable the patient to clear out secretions, to restore functional residual air volume of the lungs, ambulation, get out of bed and walk.” ...Physiotherapist P<sub>5</sub>*

*“Passive exercises of the limb, positioning of the patient, chest exercises as well, active assisted exercises, deep breathing exercise, huffing and coughing and spirometry.” ...Physiotherapist P<sub>9</sub>*

*“...exercises to mobilise the trunk and avoid straining too much the operated site. If the patient is comfortable to get out of the bed and seat out of bed, stand and walk.” ...Physiotherapist P<sub>10</sub>*

Besides that, one participant was diffident about physiotherapy in ICU:

*“...we have those who specialised in cardiac surgery. So I am not aware very much about cardiac in ICU or percussion or assisted breathing exercises.” ...Physiotherapist P<sub>4</sub>*

### **Postoperative Sub-acute in ward**

Once the patient is in the ward, the physiotherapy process of care continues with different therapeutic techniques as elucidated below:

*“First of all we continue with postural correction, breathing exercises, strengthening exercises like you have to measure a six minute walk test and stairs climbing for endurance and exercise tolerance.”*

*...Physiotherapist P<sub>7</sub>*

*“The breathing exercises...start long term exercise like climbing stairs and we do prepare them for discharge to cope with home environment. You can involve patients to practise activities of daily living like bathing themselves and other activities of daily living.” ...Physiotherapist P<sub>3</sub>*

*“We do the chest physiotherapy, ambulation, breathing exercises, chest expansion, huffing and coughing.” ...Physiotherapist P<sub>4</sub>*

*“We check the exercises tolerance of the patient...stairs climbing at least 5 -6 stairs ascending and descending. Chest exercises pertaining butterfly and deep breathing exercises to enhance the lung volume. Then six minute walk test without pause.” ...Physiotherapist P<sub>5</sub>*

*“...breathing exercises, coughing, movements, we encourage self-participation, we also do gait training because some patients after surgery will develop abnormal gait...posture correction too. We measure level of function by using six minute walk test to check the endurance, and what patient is able of doing himself. We may also measure range of motion.” ...Physiotherapist P<sub>6</sub>*

Physiotherapists had something to add with regards to the post-operative hospital discharge of the patients as illustrated below...

*“When the patients have been operated, you find that they are just confined to bed...with home environment as far as I know, most of the essential things are located a bit distance from the house. Sometimes a toilet is outside the house, so they must walk. Therefore before discharge we make sure they are trained six minutes walking test so that patient may cope after discharge. Others are train basic things, activities of daily living like moving to wash room, taking a shower, and other basic activities which are common being done at home.” ...Physiotherapist P<sub>8</sub>*

*“We need to do treadmill walk test to see how the patient responds with the operation so if we can have a chance, we can do this treadmill walk test to see how the patient is optimal in function. We normally have home programme with those exercises which have been done in the ward. After two*



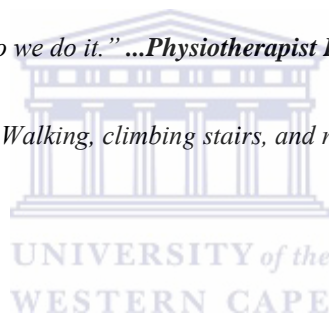
*weeks the patient will be able to do it. We provide education on how to live and cope with environment at home after cardiac surgery and how to go back to the normal functional.” ...Physiotherapist P<sub>1</sub>*

*“...as far as I know, any Physiotherapist in order to make patient self-independent, should programme exercise to continue after discharge. The therapist should review his programme after certain period of time. So rehabilitation should be a continuous process.” ...Physiotherapist P<sub>2</sub>*

*“They extend exercises. Breathing exercises, huffing – coughing, stairs climbing, and activities of daily living which can help them resume to their normal work. We talk to them after assessment before they go home.” ...Physiotherapist P<sub>3</sub>*

*“...exercise to improve breathing patterns, exercise, to control posture, and exercises to improve endurance and the heart function by walking stairs, walking in the corridors, and this kind of activities. Also having some sessions to talk about their situations that will be at home while patient is in the ward. That is the right time also we do it.” ...Physiotherapist P<sub>10</sub>*

*“We give them home program. Walking, climbing stairs, and riding bicycle.” ...Physiotherapist P<sub>9</sub>*



### **iii. Dosage**

When participants were asked about therapeutic dosage prescribed to the cardiac patients, there were hesitations and wide variations among them as echoed below.

*“I am not sure on the specific time frame of session and interval but I know the Physiotherapist located there is trying to go morning and let’s say after lunch but the time spent with patients I am not sure.” ...Physiotherapist P<sub>2</sub>*

*“...I think might vary, it’s not easy to set the dosage although in physiotherapy we normally say fifteen minutes. But that will depend to the tolerance of the patient and the coping strategies he/ she has. According to our hospital setting, it is once a day.” ...Physiotherapist P<sub>8</sub>*

*“There is no specific time an individual can be assigned to do exercises but normally we see the tolerance of a patient, levels of exhaustion, if we see any report of pain or discomfort, so these are the*

*things that limit the duration of treatment. But the individual tolerance can take ten to fifteen minutes in the training exercises.” ...Physiotherapist P<sub>10</sub>*

*“...also it depends on the level of the function of those patients...” ...Physiotherapist P<sub>6</sub>*

Following above information, the researcher probed participants in order to get depth of the information in specific phases of cardiac rehabilitation. Then participants were able to explain further as established here underneath.

### **Pre-Operative dosage**

There were variations among therapists ranging between 15 to 60 minutes as specified below.

*“Pre-operative phase can be one day. In one session you can teach patient and make sure he/ she understands. The length of a session depends, because you can have group therapy like two or three or four patients who are planned for operation if they have the same type of operation. You can prescribe the same thing to them. You can take like not less than one hour.” ...Physiotherapist P<sub>3</sub>*

*“...you can do forty five minutes daily.” ...Physiotherapist P<sub>5</sub>*

*“Mostly fifteen minutes to half an hour daily depending on the condition of patient. In ICU you spend more time.” ...Physiotherapist P<sub>4</sub>*

Moreover, one participant assumed that inconsistency in the pre-operative sessions is because cardiac surgery are planned operations and patients only come to the hospital specifically for it while other patients are only referred from other wards within the hospital.

*“Sometimes these patients are admitted two days or some are admitted long, you know some patients they are not directly admitted to the cardiac wards, they may start in other medical wards, then they are transferred from those wards to cardiac wards. So there will be continuity. It depends but I may say that not less than two days. One day I may say it is very seldom because those operations are*

*planned operations. They are planned operations where patients are given the particular date for admission. Then they come in the ward, they start pre-operative preparations, is when we Physiotherapist also see these patients.” ...Physiotherapist P<sub>6</sub>*

## **ICU dosage**

In the ICU, researcher noted some fluctuations of dosage among therapists. Each individual as revealed below mentioned what he / she think work for him/ her when managing patients following cardiac surgery.

*“The patient tolerance is low. You may take even five minutes at the interval of five minutes intensifying up to thirty minutes twice or thrice a day. All these things are being determined by the conditions of the patients and their level of tolerance. You might want to work with the patient even for long. You want to spend thirty minutes with the patient but the patient condition does not allow. You increase frequency, and shorten the time spent with the patient. You have less treatment session but more frequency.” ...Physiotherapist P<sub>6</sub>*

*“First day you can perform exercises for thirty minutes because you’re monitoring patient’s ability to tolerate exercises. Next visit, you can add up to forty five minutes to one hour. If you started ambulation out of bed, you can spend one hour with patient. Patient’s tolerance to exercise and vital signs should be a major concern. Normally here at MNH we attend them twice a day, I mean morning and evening.” ...Physiotherapist P<sub>3</sub>*

*“In ICU you should take more time than fifteen minutes. The time varies depending on a condition. Should be daily for up to three times a day.” ...Physiotherapist P<sub>4</sub>*

*“In ICU you can start with fifteen minutes in a single session but there is a chance to progress daily. You can go up to fifteen, twenty, and twenty five so that is progression according to improvement of a patient.” ...Physiotherapist P<sub>5</sub>*

## **Post ICU (in the ward) dosage**

Variations of dosage reported to continue for post ICU among therapists. The quotations below are what the researcher heard from respondents.

*“More than thirty minutes. It depends on a condition of a patient; it can be once or twice a day.”...Physiotherapist P<sub>4</sub>*

*“...work with the patient thirty minutes but should not exceed forty five minutes.” ...Physiotherapist P<sub>6</sub>*

*“In the ward, it is not less than forty five minutes session training because there we say the patient is almost stabilised but there is a period of a pause between a sessions even five minutes daily.”*

*...Physiotherapist P<sub>5</sub>*

*“...Longer. Can take even an hour because patient can do lot activities once in a day.”*

*...Physiotherapist P<sub>9</sub>*

One participant was quoted below emphasising on the significance of progressive therapy.

*“...is more than fifteen minutes. Of course you have to prepare patient for the graduation...If you want someone to graduate, you shouldn't stick only on fifteen minutes. You should go more than fifteen minutes, and normally when they walk at home, they walk more than fifteen minutes. Therefore you should prepare them to cope with exercises which will assist more than fifteen minutes. Therefore you can go to fifteen, twenty, twenty five, thirty, there off they go to sixty minutes once a day. That's it.”*

*...Physiotherapist P<sub>8</sub>*

### **iv. Physiotherapy on weekends and public holidays**

Beside the information gathered on the process of care there are several patients who require therapy on public holidays and weekends at MNH Cardiac Unit. Therefore the researcher enquired of the participants how they managed those patients:

*“It is difficult to get therapists during the weekends but the ones who are responsible for the wards, they can call him. But if not around, automatically patients cannot get good service because there is no formal way of keeping therapist during weekends for these patients.” ...Physiotherapist P<sub>1</sub>*

*“If it is weekend sometimes we have Physiotherapist on call. If you have that consultation and you’re on call, you have to attend that patient. We only have one Physiotherapist in cardiac surgery. If he is not around, we choose another one because we don’t have any specialise Physiotherapist. So anyone can go.”  
...Physiotherapist P<sub>7</sub>*

*“There is a person who is responsible for the cardiac wards. So if the consultation comes late hours on Fridays example 2 pm, in really sense it will be very difficult for this patient to be seen on weekends. I don’t mean that patients don’t get treatment over weekends, I mean when consultation come late Fridays but if the consultation has arrived to us before Fridays, this patient will get treatment as required.” ...Physiotherapist P<sub>5</sub>*

*“Usually we have a schedule; there is always a Physiotherapist on call daily. There is a monthly plan with all Physiotherapists. It is a plan made for each month and each day there is a Physiotherapist who is on duty. So if there is consultation especially weekends, there is somebody over the weekend that will be responsible for those patients.” ...Physiotherapist P<sub>6</sub>*

*“Anyway, we have a job allocation plan for the whole year. We have divided these wards among Physiotherapists...for instance we have got more Physiotherapists allocated in medical wards...”  
...Physiotherapist P<sub>6</sub>*

## **v. Outcome measures**

As part of process of care, the researcher desired to know the outcome measures used by therapists in MNH cardiac unit.

*“We measure level of function by using six minute walk test to check the endurance, and what patient is able of doing himself. We may also measure range of motion.” ...Physiotherapist P<sub>6</sub>*

*“...do measurements of the progress by six minute walk test, every after two week’s post-operative. Cardiac management is a scientific thing, should be measurable.” ...Physiotherapist P<sub>1</sub>*

*“...an ordinary walking test for six minutes to see whether the patient can sustain how much distance in a given time...assess using the outcome measures which are spirometer, Visual Analogue Scale and also sometimes from the verbal witness, from the patient himself. Borg scale is not really in practice here...”...Physiotherapist P<sub>10</sub>*

*“The physiotherapist should know if the patient is gaining enough and the exercise should become harder.” ...Physiotherapist P<sub>2</sub>*

#### **6.2.4 Challenges experienced**

Challenges are part of life especially in any working environment. In this section, Physiotherapists describe the challenges they are encountering in exercising their role as quoted below.

##### **a. Consultation**

Different opinions were derived from therapists below...

*“I think the reason is they don’t know the role of physiotherapy pre-operatively...Post-operative they don’t consult as long as patient doesn’t have chest complications.” ...Physiotherapist P<sub>7</sub>*

*“Cardiac surgery at Muhimbili and physiotherapy involvement is not much known by most cardiologists or physicians because we don’t get many patients...I think they think physiotherapy is only doing mobilisation and ambulation not chest. That is why they call when there is such kind of complications.” ...Physiotherapist P<sub>1</sub>*

*“After developing complications, is when they refer patients. If no complications, there is no patient to physiotherapy. Mostly chest complications and bed ridden patients for a week or so, then they refer to physiotherapy. It is not like there is a plan that all patients should get physiotherapy. I think because of lack of awareness of the role of physiotherapy.” ...Physiotherapist P<sub>4</sub>*

*“Of course the challenge is how do we get consultation, area of working, cooperation with patient, cooperation with staff also there are challenges. About patients, they are experiencing pain after*

surgery, so cooperation is poor. When you touch the patient, they complain ooh there is pain here, there is one here.” ...**Physiotherapist P<sub>8</sub>**

“In really sense we there is a problem since we delay to get these referrals and sometimes it might take even three to four days before we receive it. In our reception desk after surgeon have written so, we may say that the problem is between the nurses and the attendants who are the one to bring the consultation to our department. They write in the patients files and the nurse who will be in round with that particular surgeon is the one who will be responsible to make sure that the attendant will bring the files to our department within twenty four hours.” ...**Physiotherapist P<sub>5</sub>**

## **b. Discharging of a patients**

Less involvement in the discharge of patients was purported by participants:

“...may be just getting by surprise that this patient is not there. That is what happens most of the time. So provided...is convinced that this patient can go home, and they go home...I think the system has some deficit on the patient discharge program.” ...**Physiotherapist P<sub>10</sub>**

“Not much Physiotherapist involved in discharge. You can see the patient today; tomorrow you find the patient discharged.” ...**Physiotherapist P<sub>1</sub>**

“You go to the ward, and find the patient is already discharged.” ...**Physiotherapist P<sub>6</sub>**

“It’s better if doctors would discharge these patients through physiotherapy so that they can have good explanation on how to live with this particular problem...there are precautions which must be taken...because certain activities like riding bicycle, playing football or playing volleyball should be done to some extent. Otherwise if these patients don’t know, they will just be dormant waiting for another disease to attack because they are not much involved into physical activities.” ...**Physiotherapist P<sub>1</sub>**

“This system of discharging patients through physiotherapy is not a task...” ...**Physiotherapist P<sub>9</sub>**

*“No! Not involved. I don’t know why we are not involved. May be is the availability of physiotherapist located all time in the ward because we are not always in the ward because we only go in the ward the time we are supposed to be in the ward. Other time we are in the outpatient clinic. If the doctor passes and sees the patient has improved, they can discharge but sometimes they can consult you before discharge but not always. They seldom consult us. We should be involved, that a certainty.”*  
**...Physiotherapist P<sub>8</sub>**

**c. Follow up**

It was also reported that there was challenge in follow up procedures of the patients post-operatively after hospital discharge to home.

*“After discharge, these patients are not being told to continue with physiotherapy. You see the patient in the ward and you will never see the patient again as outpatient, is gone. So there is no close follow up for these patients. We can closely follow them once they are admitted in the ward. Once they are discharged, is not easy for us to see these patients.”* **...Physiotherapist P<sub>6</sub>**

*“I don’t see any close follow up to these patients unless otherwise these patients develop something else. Sometimes these patients develops stroke, there is where they can have follow up. But if no any kind of complications, there is no follow up in physiotherapy.”* **...Physiotherapist P<sub>1</sub>**

*“I can’t say much on cardiac rehabilitation because I am not positioned there but as far as I know, any Physiotherapist in order to make patient self-independent, should program exercise to continue after discharge. The therapist should review his program after certain period of time. So rehabilitation should be a continuous process. They always coming in the cardiac clinic but concerning physiotherapy, I think I don’t see them.”* **...Physiotherapist P<sub>2</sub>**

*“What I know here at Muhimbili, patients are given appointments to come to see Doctors. But for a particular physiotherapy, I have never seen them. I think there should be a follow up of these patients after discharge...to see their progress.”* **...Physiotherapist P<sub>3</sub>**

*“Not at all. Physiotherapy doesn’t see these patients as outpatients.”* **...Physiotherapist P<sub>5</sub>**



*“Once patient are discharged, they go home and you don’t see them until when they have some complications and you see them coming back to you again.” ...Physiotherapist P<sub>10</sub>*

*“These patients are being discharged with minimal capacity so we need these patients to have a quality of life and the quality of life needs some sort of follow up to see how they cope with the environment and exercises. Some of them are young so they need to be involved in sports and leisure activities, so they need guidance from Physiotherapist on what to do and how to do in a normal active way. This is why sometimes others come back with postural deformity or any other physical problem.”  
...Physiotherapist P<sub>1</sub>*

Lack of referral from the doctors in out-patient clinic is one of reason mentioned below:

*“Doctors don’t send these patients to Physiotherapy Department as outpatients for follow-ups. We never see them to our department unless they have complications.” ...Physiotherapist P<sub>1</sub>*

*“The Doctors could not be aware of the role of physiotherapy in cardiac patients after being discharged may be. Others they know but they don’t see the necessity of acting on that. I think so.”  
...Physiotherapist P<sub>3</sub>*

*“May be Cardiac Surgeons could not be aware that physiotherapy is also needed to those patients or they don’t know what is physiotherapy. Then referring patients to our department is often not clear to them.” ...Physiotherapist P<sub>4</sub>*

*“They don’t refer patients to physiotherapy at all after discharge unless they have weakness like hemiparesis or whatever.” ...Physiotherapist P<sub>7</sub>*

*“...but most of the surgeons they do not know physiotherapy. They are not aware of physiotherapy that can help those patients. That is why they don’t see why they should discharge through physiotherapy. There are very few Doctors who know the importance of physiotherapy to these patients.”  
...Physiotherapist P<sub>9</sub>*

Financial instability of the patients was also reported as one of the reasons as illustrated below.

*“The financial constraints of patients just to come as a follow up. We find that it is not easy for them once they have been discharged to come back as an out-patient. Therefore you find that your programme which you have already set to be attained as an out-patient, it won’t be implemented because of the poor follow up of the patient.” ...Physiotherapist P<sub>8</sub>*

*“Usually after discharge, they are not coming back. The problem could be financial problem because most of the patients are coming outside this region so financial status also contributes. Almost all patients should be seen after discharge to see their progress...it can be once a week or twice a week.” ...Physiotherapist P<sub>4</sub>*

*“...most of the patients expect to come for the clinic when they have a functional impairment. If they are mobile, you might find that they think they are not due to attend physiotherapy. They only attend follow up cardiac clinic to the doctors.”...Physiotherapist P<sub>8</sub>*

It was however perceived differently by two therapists who thought that Physiotherapists themselves are to blame on this situation due to poor planning:

*“This is because there is a weakness in planning...” ...Physiotherapist P<sub>5</sub>*

*“Like I said, there are goals set by Physiotherapist which should be shared with the Doctor. But if the Doctor don’t see your goals, is not easy for them to think that there is a role to be played by Physiotherapist later. If they don’t see any functional disability, they can’t refer patient for physiotherapy.” ...Physiotherapist P<sub>8</sub>*

One therapist further stressed that:

*“Physiotherapy should communicate with patient from day one pre operatively so that they may know there is continuation of therapy post-operative and post discharge so that when they come as an outpatient they should see the need of coming to physiotherapy as well so that you can assess if there is any new things which have been attained post discharge.” ...Physiotherapist P<sub>8</sub>*

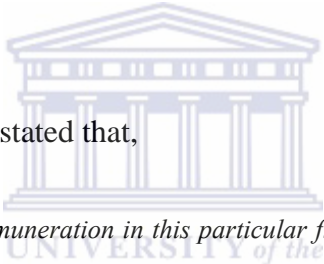
This is a challenge as participants' think that they do not get enough time to know the quality of life these patients are having post-operatively. Proper management at the hospital will help patient to be independent, as sometimes most of the basic needs are located within walking distance from where they stay.

#### **d. Motivation**

Motivation is a broad term but in this case, motivation to Physiotherapists is related to remuneration, training and workshops.

#### **i. Remuneration**

Under this challenge, participants stated that,



*“There is also a problem of remuneration in this particular field. Remuneration is a challenge. When you see your fellow colleagues like nurses, doctors and others in Cardiac Unit are given a chance to go to school, sometimes to go to the seminars, training but you Physiotherapist your never given the chance, that makes many Physiotherapist not interested.” ...Physiotherapist P<sub>1</sub>*

*“People are interested but always government cries the financial problem. People have shown interest but finance is a problem.” ...Physiotherapist P<sub>2</sub>*

*“There is no fund...” ...Physiotherapist P<sub>5</sub>*

#### **ii. Training**

Lack of trained personnel in the area of cardiac surgery was conveyed to be among of the challenges facing therapists working at MNH. Nonetheless, currently there is only one trained therapist who was exposed in ICU cases abroad:

*“Physiotherapists were not trained, others were trained, obvious the management will be different...This is danger, may harm patients because you find that Physiotherapist don't know medication given and their impact to patient. So when he intervenes, he should know the time medication given and its effect to therapy should be trained.” ...Physiotherapist P<sub>1</sub>*

*“The cardiac management whether pre or post-operative is something very unique. Therefore it needs education, very competence, in order to provide the competent services. Therefore education is very important to the Physiotherapist. No expert Physiotherapist in this field. Is only one member got orientation but I think in my perspective, it is not enough.” ...Physiotherapist P<sub>2</sub>*

*“Of course there is too much hesitation for the therapists who are not trained or were not exposed to cardiac patients to attend them. The patients are in trouble because it is not easy to be attended when the responsible person trained to expose those patients is not around...no continuous professional development courses” ...Physiotherapist P<sub>8</sub>*

*“...there is need of having Physiotherapist who are specialised to that particular area. So that to have confidence to that patients.” ...Physiotherapist P<sub>3</sub>*

*“There are only few people who had short course for three months, just orientation course in cardiac but not much as specialists in cardiac.” ...Physiotherapist P<sub>1</sub>*

*“We do not have enough knowledge on these patients...I use my common knowledge from other surgery, the normal surgeries. Most Physiotherapist they don't like working in cardiac patients. Their reason is that; they are not conversant with those conditions. They don't have enough skills to work with those patients.” ...Physiotherapist P<sub>6</sub>*

### **iii. Shortage of staff**

There is only one therapist allocated to a cardiac unit throughout the year. This therapist attends to all the patients on his own and it is a challenge when he is not available. It came to the point that sometimes patients do not receive quality therapy because of the shortage of therapists. It is so sad that workload decides the day of the therapist and the time to be spent

with every patient. One therapist to perform his daily out-patient clinic, and then attend pre-operative and post-operative patients is a challenge. The quotations below explain the scenario.

*“It even may go to twenty minutes but this also depends on the condition and a workload of that day. As usual in the ICU we don’t have many patients. So you can have an ample time to work with them as much as possible.” ...Physiotherapist P<sub>10</sub>*

*“And you find that, the problem with management they only trained one which means you have to chase that one who have been trained.” ...Physiotherapist P<sub>8</sub>*

*“We have a job plan to be in the out-patient clinic until 12:30 pm then go to the ward. We provide the quality service but sometimes it depends if we have many patients...” ...Physiotherapist P<sub>7</sub>*

*“There are situations that you find the condition of a patient requires the Physiotherapist to see the patient twice daily like those conditions where you have an individual with too much secretion. And if the patient is too much immobilised and has less activities the secretions may tend to increase and cause some problems to the chest. Others who are not complicated, normally we see them once daily... depending on the number of patients...in that day. It may happen...see them twice but normally...once.”  
...Physiotherapist P<sub>10</sub>*

*“...I think we should increase number of Physiotherapist being there and to be there permanently. If one is not around, another can take that part.” ...Physiotherapist P<sub>3</sub>*

#### **iv. Facilities**

In the new cardiac building, the researcher was informed that there was no Physiotherapy Unit and so Physiotherapists perceive that set up does not favour them as quoted below.

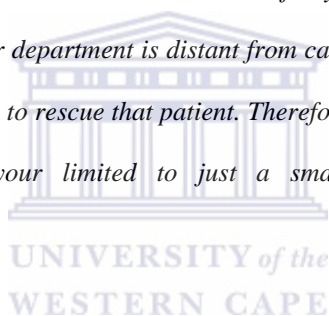
*“No physiotherapist office, no gym, no equipment like bicycle or treadmill in new cardiac building. The set up does not favour Physiotherapist at all.” ...Physiotherapist P<sub>1</sub>*

*“There is no physiotherapy unit there...and the truth is that we are lacking even a training ground of these patients in the cardiac building.” ...Physiotherapist P<sub>5</sub>*

*“We have limited resources in exercising our roles. For example, before exercise you would like to take vitals to the patient but you find that you don’t have BP machines, spirometer, stethoscope, things like that. Also no portable monitors which can be used during training.” ...Physiotherapist P<sub>8</sub>*

*“There is challenge. Not many Physiotherapists are interested with cardiac patients. Since this type of operation was established in our set up and physiotherapy involvement of these patients is not well established, most of them are not interested in this kind of the services. The setup is not favouring physiotherapy. We don’t have specialist in this area.” ...Physiotherapist P<sub>1</sub>*

*“And then the environment as well. What I know in exercising these patients you need a quiet environment and then a more secure environment where if anything happens, then you will be ready to save. But here you find that our department is distant from cardiac centre, therefore if the patient falls in the department, it is not easy to rescue that patient. Therefore we hesitate to expose those patients to our department. Therefore your limited to just a small space located within the cardiac ward.”...Physiotherapist P<sub>8</sub>*



## **v. Health practitioners**

There are perceptions that there are other challenges caused by health workers while the Physiotherapists are executing their role.

### **a. Nurses**

All therapists were in agreement that...

*“...they do cooperate well.” ...Physiotherapist P<sub>1</sub>*

*“There is no enough man power at MNH. So you find that you need assistance from nurse but you can’t get because they are not with you all the time. They are willing to assist us, to work with us but because of the set up and shortage of staff, they can’t do it.” ...Physiotherapist P<sub>2</sub>*

## **b. Doctors**

It is perceived that the only challenge on Doctors’ side is that they do not know the role of Physiotherapist in Cardiac Unit. This is well substantiated in quotations below.

*“The big challenge is that, they don’t know our role. If they could know what we can do, they would involve us.” ...Physiotherapist P<sub>1</sub>*

*“I wish...could understand the role of physiotherapy in cardiac surgery...Not every patient here in Muhimbili gets pre-operative, and physiotherapy follow up after hospital discharge.”  
...Physiotherapist P<sub>3</sub>*



However, other participants pointed out that there is no challenge between therapist and other health workers apart from shortage on the nursing side. These two participants expounded that therapist should often communicate their treatment plans to the doctors. The researcher picked up the following as well:

*“For the Doctors, they don’t know much about physiotherapy. It is we Physiotherapist to tell them our role and our scope in practice in patients post cardiac surgery.” ...Physiotherapist P<sub>8</sub>*

*“Other health professional they really work hand in hand with us. May be shortage of staff, may be nurses.” ...Physiotherapist P<sub>5</sub>*

**c. Fellow Physiotherapists**

Participants argued that there is good cooperation among therapists but when it comes to the issue of cardiac patients, the challenge begins as quoted below.

*“Therefore the cooperation between therapists who are working in cardiac and those who are not working there is good but when it comes to their patients, there we will beg to stand everyone in their position.” ...Physiotherapist P<sub>8</sub>*

*“...in surgery we don't have a lot Physiotherapist as most Physiotherapist they don't like working in cardiac patients. They are reason is that; they are not conversant with those conditions. They don't have enough skills to work with those patients.” ...Physiotherapist P<sub>6</sub>*

*“...employees are not very well trained in this field.” ...Physiotherapist P<sub>10</sub>*

Lack of standard of treatment among therapists was also mentioned by participants below.

*“Therapist among ourselves we lack standard of treatment. Dosage can be different between therapist and therapist. Techniques differ between therapist and therapist. Frequency is different between therapist and therapist. But we have same intention; we have the aim of reaching the same goal. But the way we are performing, time we are performing, frequency we are performing, might find it differs.”...Physiotherapist P<sub>5</sub>*

*“We were all taught at school about chest exercises. We use that knowledge...” ...Physiotherapist P<sub>7</sub>*

*“...if this person go to the holiday, anyone can be chosen to take care of these patients. Anyone! That's why I am saying we don't have standard treatment. You go there with your technique, you perform.” ...Physiotherapist P<sub>5</sub>*

Other challenges among therapists are:

*“Sometimes I am not used to be with those sophisticated patients then when it happens to go there, really minded you're not prepared. So challenge comes, will I manage to offer proper exercises, those are some personal challenges.” ...Physiotherapist P<sub>3</sub>*



*“They can see, they are not recognised well in this particular area. So they are frustrated. There is a frustration when you go to the cardiac unit.” ...Physiotherapist P<sub>1</sub>*

*“To colleagues, is very hard in this kind of situation...very hard for them to cooperate and work together...they try to avoid the blames because that is the thing because the system is not established by the institution where physiotherapy comes in, when physiotherapy comes in and what physiotherapists do. This clear system has to be established to help these individuals work comfortably. I think the fear comes from that corner.” ...Physiotherapist P<sub>10</sub>*

### **6.2.5 Suggested improvements**

Identifying challenges cannot cure the problem. There should be a way forward which could be used to make things in place and as a result help patients. All these professionals are working for the patients. This is good for the unit as it could be used as a stepping stone for resolving identified shortcomings. Physiotherapists' have not done much to face these challenges, there should be the way forward. The researcher is wondering if the management is aware of what is going on. There is a need for something to be done in this situation. For this reason, there are suggestions made by participants.

#### **i. Communication**

One of the suggestions that emerged was communication. There is a need to strengthen communication among health practitioners in the Cardiac Unit. It seems there is a communication breakdown somewhere. With improved communication, participants quoted below perceive that there will be unit among multidisciplinary team members working in MNH Cardiac Unit.

*“...communication between health workers professionals working in cardiac unit with physiotherapy should be improved much. If we improve communication, everything will be in place because the role of every profession including physiotherapy will be known.” ...Physiotherapist P<sub>1</sub>*

*“I think they should work as a team as a unit to help those patients...they should work together rather than is now.” ...Physiotherapist P<sub>3</sub>*

*“...we really need to consolidate our rehabilitation team which means Cardiac Surgeons, Cardiologists, Nurses and whosoever.” ...Physiotherapist P<sub>5</sub>*

*“The communication system should be improved, and the way this institution works between different departments has to be improved.” ...Physiotherapist P<sub>10</sub>*

It came to the point that the Physiotherapists' are also responsible for these shortcomings, as other participants thought that the communication on the side of therapists is poor. To strengthen communication, there is a necessity for Physiotherapists to come out first and speak loudly. There must be a starting point and thus participants were pressing toward their profession as a starting point.

*“It is a problem but the only way we can do away from it is just to talk to the Doctor and elaborate your plan from day one and other days when you attend patients. Because if the Doctor reads you a lot that you still have programmes with the patient, they must consult you before discharge. If you don't have plans or you didn't show from day one, then it will be difficult for Doctor to know that you still have plan to that patient.” ...Physiotherapist P<sub>8</sub>*

*“What I can add is that, Physiotherapists should work hard to sell our profession to other professionals. We Physiotherapists should speak our problems particularly to those involved in cardiac surgery.” ...Physiotherapist P<sub>1</sub>*

*“What I see myself is lack of communication. We need to intensify communication among us. May be during meeting, we need to emphasise the importance of involving physiotherapy.” ...Physiotherapist P<sub>6</sub>*

## ii. Training

All participants come to an agreement that:

*“Physiotherapists should go to specialization because the problem of cardiac surgery is increasing now days. For instance there is a new building for cardiac surgery which needs more staffs including Physiotherapists.” ...Physiotherapist P<sub>1</sub>*

*“First is to increase the competence of Physiotherapists...On and off workshops relating to management and cardiac rehabilitation of these patients...” ...Physiotherapist P<sub>2</sub>*

*“I don't know, maybe this is for management, not for you...you need enough knowledge; you need to have enough skills to comfortably work with cardiac patients. People feel insecure...train more Physiotherapists in Cardiac so that we work effectively and efficiently like in other areas...we are not yet competent and more experienced in managing these people. So we still need to have skills so that we could work comfortably with these patients, and where to get them, is to go for further training.” ...Physiotherapist P<sub>6</sub>*

*“There must be a special training programme for Physiotherapist so that they can be oriented in the managing patients undergoing cardiac surgery instead of depending on one who is not even reliable I could say. It is not easy for that person to be there all the time, he can go holiday, can be sick, or have an excuse, or he can go somewhere for continuous profession development. Therefore we should have more personnel. I mean we should invest more on human resources on cardiac surgery regarding cardiac rehabilitation.” ...Physiotherapist P<sub>8</sub>*

## iii. Evidence Based Therapy

The researcher enquired if the participants were aware of the significance of physiotherapy between those patients receiving therapy and those who do not. All therapists perceived that there is significance but they do not have statistical evidence. They also confirmed that they

were short of an evidence-based approach, even for the cardiac patients they have been attending to.

It was explicated that:

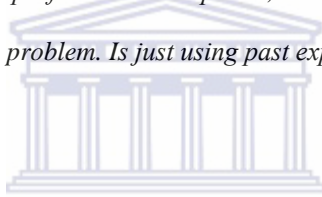
*“I think there is difference though I cannot produce statistical figures to prove...”*

*...Physiotherapist P<sub>10</sub>*

*“...Because it has taken same very few since they started cardiac surgery, so we don't have comparison of those patients.” ...Physiotherapist P<sub>9</sub>*

*“So we need to go to school and to do more research on cardiac on how physiotherapy can intervene.” ...Physiotherapist P<sub>1</sub>*

*“We don't have any continuous profession development, not even publications, no journals I can say. Working in cardiac surgery is a problem. Is just using past experience.” ...Physiotherapist P<sub>2</sub>*



Lack of evidence-based practice could affect patients as the therapist just pops in to the ward, sees the patient, assesses and implements according to his/ her experience as exemplified below by participants.

*“We were all taught at school about chest exercises. We use that knowledge...” ...Physiotherapist P<sub>7</sub>*

*“...we don't have standard treatment. You go there with your technique, you perform.” ...Physiotherapist P<sub>5</sub>*

#### **iv. Establishment of Physiotherapy Unit in a cardiac complex**

Respondents perceive that physiotherapy sub-unit should also be established within a Cardiac Unit with identified facilities used in cardiac rehabilitation so as to interrogate therapist within the centre. Participants thought that this could help patients to receive quality service

in a specified time. Even an issue of consultation is perceived by therapists quoted below, will be resolved automatically if only the management establishes a physiotherapy Sub-Unit.

*“They should establish Physiotherapy Department or Cardiac Rehabilitation Department within the cardiac building. They should establish office, treatment area and equipment together with training more Physiotherapists in that particular area.” ...Physiotherapist P<sub>3</sub>*

*“We need enough physiotherapists specialised in cardiac surgery who could be stationed in the ward.”  
...Physiotherapist P<sub>4</sub>*

Not only that, but it was also perceived by one respondent quoted hereunder that by establishing a cardiac rehabilitation unit within the current set up, it could help therapists attend to out-patients, and so improve their quality of life.

*“I think the quality of life to these patients will be good. I am saying so because once...we had this follow up of patients after getting such type of operations. So if you take those patients, you can see they can explain to you what challenges, what difficulties are they facing there at home during their normal work. So you can see their progress. Some patients explain that I cannot carry a basket, maybe I cannot work to the market or when I try to go to the church, I feel some difficulties. When I try to climb mountain or go may be to fetch water, I feel difficulty in breathing. Is like those challenges. So you can measure their quality of life at home after being discharged. Physiotherapy can reassess patients in follow up clinics and communicate to Doctors if need arise.” ...Physiotherapist P<sub>3</sub>*

## **v. Motivation**

The management of MNH is urged by “Physiotherapist P<sub>10</sub>” to consider physiotherapy as among the priorities and support them in various aspects. This will help them feel recognised and boost their self-esteem which could lead to improved work efficiency in cardiac unit.

*“...if is not a priority for the institution, then it should be at least in a second part of their priority...”*

*...Physiotherapist P<sub>10</sub>*

### **6.3 Summary**

The perception of Physiotherapists on their post-operative role in management of patients following cardiac surgery is well presented. The pre-determined themes will be discussed in Chapter Seven where literature and results of other chapters will be integrated before the final conclusion.



## CHAPTER SEVEN

### DISCUSSION

#### 7.1 Introduction

This chapter discusses the outcomes of the results of the study and compares it with salient literature in the field of cardiothoracic surgery. The chapter will discuss the profile of patients who had cardiac surgery at Muhimbili National Hospital from January 2010 to December 2013 being the period of the study. It will also discuss the perception of Cardiac Surgeons and Physiotherapists regarding the role of physiotherapy in the management of patients following cardiac surgery.

#### 7.2 Profile of patients admitted to Muhimbili National Hospital

This section will discuss the profile of the patients that had cardiac surgery in Tanzania for the period of investigation.

##### 7.2.1 Socio-Demographic characteristics

The socio-demographic aspects of age and gender in the cardiac surgery were investigated in this study. In the current study, it was revealed that, the age group of adults patients operated in Tanzania in January 2010 to December 2013, ranged from 18 years of age to 62 years of age (mean 30.6; SD=10.5). The majority (76.2%) of patients were under 38 years of age. In West Africa, the patients aged from 2 years of age to 72 years of age (mean 29±15.6 years) are reported to receive cardiac surgery (Falase et al., 2013). In Sub-Saharan Africa, the patients aged 14 years to 43 years (mean 29 years) were operated in Zambia (Musuku et al.,

2013). A previous study which was conducted in Tanzania also reported age of 2 years to 56 years (mean  $19.4 \pm 12.3$ ) (Nyawawa et al., 2010).

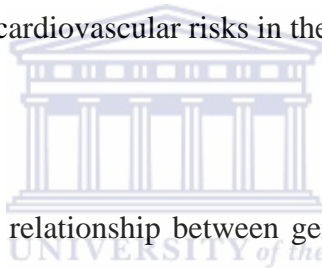
With regard to gender, in the current study, we found that there were more females (54.3%) who were operated on than males. Various researchers have also drawn attention to the difference in the percentages of males and females undergoing cardiac surgery. In a previous study conducted in the same setting, there was also high preponderance of females at 79% (Nyawawa et al., 2010). It is interesting to note that similar trends of a higher prevalence of females were found for several other Sub-Saharan Africa countries. Thus in Zambia, all patients who had cardiac surgery in 2011 were females (Musuku et al., 2013). In Nigeria, a ratio of 0.7:1 between males and females among 51 patients operated on from March 2004 to December 2013 is reported (Falase et al., 2013). All these show percentage considerably higher than the present study. A possible explanation for this could be the fact that, these studies included both paediatric and adult cases whereas the current study only reported on adult patients. In addition, the study by Musuku et al. (2013) included cases performed by visiting cardiac surgeons whereas the study by Falase et al. (2013) had a relatively small sample size and therefore the difference between males and females were not significant to draw a conclusion.

In contrast to these studies from underdeveloped countries, the studies in developed countries reveal quite different results. Thus in a recent study by Zakaria, Nicolas, Maxime, Jean-Benoit, & Frederic, (2013), reported that adult males comprised almost three quarters (72.0%) of patients that had cardiac surgery in France. On the other hand 2003 statistics from the United States of America indicated 2.9 million women underwent cardiac surgery as opposed to 3.9 million men (Thom et al., 2006). Yet, the current



American Heart Association report by Go et al. (2014) suggests that there was no significant difference between males and females suffering from heart valvular disease that underwent cardiac surgery.

To date, there is no consensus in the literature on the reasons for a high prevalence of females undergoing cardiac surgery in most developing countries as opposed to developed countries. However, it was reported that females are frailer than males (Lee et al., 2010). Lee and colleagues (2010) described frailty by using Katz index for activities of daily living and ambulation. Explaining the reasons for the number of females to be as high as 410,000 operated annually in the United States of America (USA); Fox and Nussmeier, (2004) noted that females are exposed to more cardiovascular risks in their lifetime than males.



Viola et al. (2003) examined the relationship between gender and poor recovery following coronary artery bypass graft (CABG). They concluded that females had more difficulties in recovery than males following cardiac surgery. Furthermore, they observed that women are more at-risk of developing post-operative complications than men, which is a contributing factor for their higher mortality and post-operative complications. Guru et al. (2006) argues that females have more complex pre-operative presentations and are more likely to be re-admitted post hospital discharge. However, Plach (2002) established evidence to indicate that cardiac rehabilitation following cardiac surgery is an important component in facilitating women recovery. However, it is not well established whether physiotherapy has a role in facilitating females' recovery as opposed to males' following cardiac surgery. There is thus a need for randomised control trials to investigate the role of physiotherapy as part of cardiac rehabilitation in a gender differences.

### **7.2.2 Patterns of cardiac conditions**

The present study found that Rheumatic Heart Disease (RHD) which is a result of acute rheumatic fever on the heart valves was the major cardiac disease (74.0%) leading to cardiac surgery. Also RHD was responsible for over half 53.9% of all patients with double valve disease (i.e. mitral valve with or without other heart valve) and 39.8% for the mitral valve disease. We also observed that the disease has been the leading cause of cardiac surgery in Tanzania since 2010 and was the second to pericardial conditions in 2013.

The most recent by Nyawawa et al. (2010) conducted at MNH revealed that RHD was the leading disease (47.6%), followed by congenital heart disease (35.2%). The situation is not different to what was found in Zambia, whereby RHD accounted for five of the seven (71.4%) patients operated in 2011 (Musuku et al., 2013). Like Tanzania, rheumatic heart disease was and is still the leading cause of heart valve surgery in most developing countries (Ussiri et al., 2010; Marijon, 2009). According to Mirabel et al. (2012), RHD remains the major cause of acquired cardiac disease globally, primarily in low and middle income countries. African countries like Mozambique, Senegal and Uganda are reported to have higher prevalence of RHD in Africa compared to other nations (Zühlke, Mirabel, & Marijon, 2013; Mirabel et al., 2012). The screening conducted in East Africa, precisely Uganda for the school children, it revealed that there was a prevalence of 14.8 cases per 1 000 diagnosed with RHD (Beaton et al., 2011).

However, literature has reported different cardiac conditions leading to cardiac surgery in developed countries as opposed to developing countries. For instance, coronary heart disease is reported to affect developed countries whereas Rheumatic Heart Disease (RHD) is the

commonest in low and middle income countries affecting heart valves (Go et al., 2014; Mendis et al., 2011). Go et al. (2014) point out that RHD is not so common in Europe and USA but is still endemic in Asia, Africa and the Pacific countries. The report further adds that approximately 233, 000 people are dying annually due to RHD in the World Health Organisation (WHO) regions excluding USA.

Although RHD is a burden in most African countries, South Africa is the only country in the continent which developed and implemented national guidelines for RHD prevention (Zühlke et al., 2013; Mirabel et al., 2012). It can be argued that South Africa has done so due to its stronger and enabling economic condition and political will which is a challenge to other countries to follow its example.



### **7.2.3 Type of cardiac surgery**

The present study established that surgical intervention pertaining double valve (i.e. mitral valve with either aortic or tricuspid valve) accounted for 42.0% of all cardiac surgeries performed in January 2010 to December 2013. It is to be observed that mitral valve was involved in all double valve procedures, and thus a cumulative 71.4%. Also, it was noted that procedures pertaining mitral valve as a single valve replacement, accounted for one third of all cardiac procedures. During interview with cardiac surgeons, it was also established that MNH Cardiac Unit performed more heart valve surgeries than other types of procedures.

In the current study, pure mitral valve was as high as 31.4% compared to 19.4% reported by Ussiri et al. (2010) in Tanzania and 24% reported in Sudan (Lindblom, 2011). However, it is

in a borderline when compared to 37.3% reported by Mirabel et al. (2012) and Essop and Nkomo, (2005). In the previous study (Nyawawa et al., 2010) carried out in Tanzania, mitral valve procedures accounted for over half (58.1%) of the cardiac surgeries. The current rate of valvular disease in Tanzania is higher than the 23.0% reported in South Africa (Sliwa & Mocumbi, 2010). In Sudan, all 71 patients operated on, had valvular heart disease (Lindblom, 2011).

Due to the advancement of technology, there are different types of cardiac surgery procedures performed widely including heart transplant (Go et al., 2013). Furthermore, these procedures are more common in industrialised countries as opposed to non-industrialised countries. Moreover, heart transplant and CABG, among others are the commonest procedures recurring well established centres and cardiac experts which rare to find in low income countries (Go et al., 2013; Marijon et al., 2009). On the other hand, heart valve surgeries are more common in developing countries than in developed countries (Mendis et al., 2011). Regardless of the type of procedure performed, still cardiac surgery is considered as a life-saving procedure for the patients presenting with severe persistence of symptoms after medical therapy (Essop & Nkomo, 2005).

Whereas in the United States of America, mitral valve is reported to be the commonest (11.7%) for Americans above 75 years of age (Go et al., 2014); the majority of patients (65.7%) operated on in Tanzania, were young aged from 18 years to 42 years of age. This is due to the fact that, RHD is the commonest cause of valvular disease in young age predominantly in developing countries like Tanzania. There is a need for more research in this area on how to reduce the effects of RHD.

#### 7.2.4 Annual case load of cardiac procedures

In the present study, a decrease of annual cardiac surgeries from 48.6% in 2010 to 10.5% in 2013 was observed. In explaining the trend during interview, it was established that the decrease is due to political issues, that relates to lack of funding which has complicated to limited consumables purchasing and limited staff development as proposed possible reasons for this as the following quotation from one Cardiac Surgeon testifies.

*“Since 2008, 2009, 2010, and 2011 we were doing one hundred patients per year. But since 2012 to date, the number has gone down because of political issues, lack of consumables, and some in academic reason. We didn’t operate much and I think by 2013 to date we didn’t even operate more than ten patients. So this is all about our centre.”...Cardiac Surgeon 48 years of age*

According to WSA, (2011) and Airan, (2005) cardiac surgery is expensive procedure requiring many disposable consumables which are only imported from developed countries. India has been facing the same challenge of importing consumables for cardiac surgery (Airan, 2005) and Tanzania is not exempted. Cardiac surgeries are intensively consuming resources thus running a cardiac centre requires financial stability from the respective institute and government at large (WSA, 2011).

Politics has been a challenge in most developing countries. Political instability of the country and politics within the working environment can easily ruin the achievement which has been obtained in the area of cardiothoracic surgery (Marijon et al., 2009; Stolf, 2007; Airan, 2005; Ghosh, 2005). Falase et al. (2013) reported from Nigeria that politics was among the factors that affected the cardiac centre. It is not easy to pinpoint how in Tanzania politics has impacted in the field of cardiothoracic surgery though it can be said that political will lacks

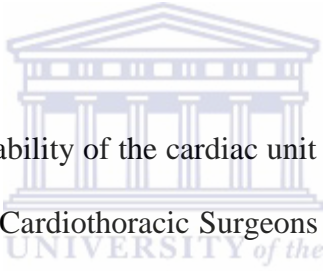
and does exist either from top down or bottom up especially when individuals lobby for change (Pezzella, 2010; Kuehn, 2007; Sheldon, 2006; Airan, 2005). Thus it is advised that:

*"Health care is too important and complicated issue to be left to the politicians"*

(Airan, 2005, p 137).

With regards to the shortage of cardiac surgeons, the situation is challenging in Tanzania as elucidated below by one Cardiac Surgeon during an interview...

*"You can imagine a population of forty five million people to depend on two Cardiothoracic Surgeons..." ...Cardiac Surgeon 49 years of age*



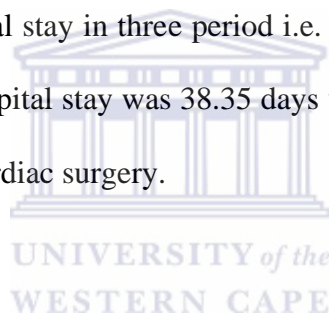
This is a challenge for the sustainability of the cardiac unit in Tanzania. In USA, the shortage is also observed with a ratio of 2 Cardiothoracic Surgeons for 10,000 patients (Grover et al., 2009). Although Grover et al. (2009) reported this as a shortage, the ratio is far better than Tanzania. Varma and Gupta (2013) also reported that in India the burden of cardiac surgery has doubled and there is shortage of man power. In Africa in general, the ratio of Cardiac Surgeons to the population is 1:38 million people as opposed to 1:3.5 million people in Europe and North America. The comparable ratio for Asia is 1:25 million people to Southern America 1:6.5 million people (Hoffman, 2013). Literature suggests that, this situation is mainly contributed by the number of years spent before qualifying to be a Cardiac Surgeon (WSA, 2011; Grover et al., 2009; Airan, 2005).

Although this study focused on patients above 18 years of age, there is still an overall significant decrease in cardiac surgeries when compared to previous studies which recorded

105 procedures in one year (Nyawawa et al., 2010; Ussiri et al., 2010). These challenges are common in low and middle income countries as they struggle to establish and maintain cardiothoracic centres (Marijon et al., 2009; Velebit et al., 2008). Different factors such as financial constraints and lack of personnel hinder progress of most cardiothoracic centres in these countries. It is in this regard that Tanzania should lay a strong foundation to reduce the above identified shortcoming otherwise the pattern of annual decrease for cardiac surgery will be devastating.

### **7.2.5 Hospital stay**

The current study defined hospital stay in three period i.e. pre-operative, ICU stay and Ward stay. The mean pre-operative hospital stay was 38.35 days with over half (52.4%) waiting for more than 28 days prior to the cardiac surgery.



The present study has shown that, patients waited long in the hospital as opposed to an average of 8 days reported in Senegal (Kane et al., 2011). Pezzella, (2010) observed that a longer pre-operative hospital stay is common in most developing countries and it seems that this will continue due to the lack of consumables, equipment, shortage of staff and financial instability. This longer waiting period has a negative impact on the life of patients as most of them die in the course of waiting for the life-saving procedure (Musuku et al., 2013).

This study also revealed that, the mean ICU stay was 6.4 days which was higher than the  $4.5 \pm 2.1$  days reported by Nyawawa et al. (2010); 3.5 days in Australia (Gardner, Elliott, Gillc, Griffind, & Crawford, 2005) and  $1.5 \pm 0.5$  days in Cameroon (Tantchou et al., 2011).

In another study from Canada, it was reported that 75.0% of patients were discharged from ICU within 3 days while 4% stayed more than 14 days (Laupland et al., 2006). However, these studies (Tantchou et al., 2011; Nyawawa et al., 2010; Laupland et al., 2006; Gardnera et al., 2005) did not indicate if physiotherapy was prescribed to these patients and if it had any significance difference to the short hospital stay. Another challenge is that, the studies did not reveal the difference between at-risk patients from those who had no complications prior to cardiac surgery making it difficult to compare findings with the current study.

This current study also noted that a third 33.0% of cardiac patients operated on, were discharged from hospital to home within 8 days from the ward. Their mean post ICU hospital stay was 12.2 days ranging between 1 to 45 days, which is lower as opposed to 13.7±6.6 days ranging between 5 and 50 days (Nyawawa et al., 2010). Also, the post ICU mean hospital stay found in this study was less when equated to 21.6 days ranging between 7 days to 76 days reported in Australia (Gardnera et al., 2005).

Different studies have recorded a wide range of hospital stay depending on the set-up and cardiac procedure performed (Pezzella, 2010). Although this study focused on the post-operative management, pre-operative hospital stay was also recorded as part of the profile of the patients operated on. The findings suggests that majority of patients would wait longer pre-operatively. This can be associated to the lack of consumables and limited number of cardiothoracic surgeons in the unit. However, for the post-operative hospital stay, it cannot be concluded that physiotherapy had significance effects to their hospital stay as opposed to other setting. Thus conducting a large scale study and a randomised control trial with regard



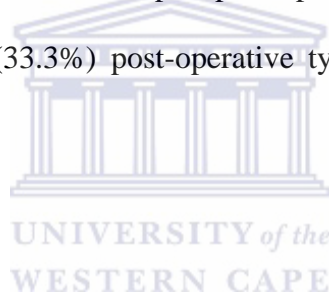
to the benefits of physiotherapy intervention in the post-operative hospital stay following cardiac surgery would be of significant importance.

### **7.2.6 Outcome of management**

This section, discusses the post-operative complications and mortality.

#### **Post-operative complications**

Post-operative complications following cardiac surgery do exist in Tanzania, and expose the patients to the risk of prolonged hospitalisation and mortality as noted in the present study. Among the 105 operated on, 20.4% developed post-operative complications in Tanzania. Cardiac arrest was the leading (33.3%) post-operative type of complications followed by pneumonia.

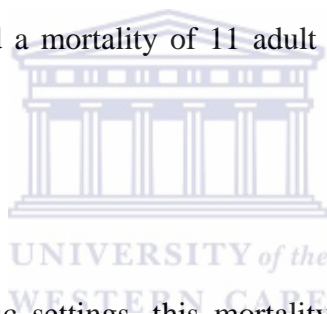


In contrast to the present study, Varma, and Gupta, (2013) reported that only 0.8% of all patients operated on from January 2010 to April 2012 developed cardiac arrest in India. However, Arcêncio, et al. (2008) reported that respiratory complications (48.7%), hemodynamic instability (22.2%) and neurological complications (14.8%) as the commonest complications likely to occur post-operatively. The study further adds that these neurological complications are triggered by the pre-operative factors such as age over 60 years, endocarditis, III/IV NYHA functional class, COPD, heavy smoking habits, and critical medical condition among others. Thus, health workers are called on to be observant with a close follow up on the at-risk group of patients assessed pre-operatively (Michael et al., 2013; Gardnera et al., 2005). Furthermore, this will help reduce fatal complications such as atrial fibrillation, pneumothorax, stroke and endocarditis among others.

Literature has shown that different types of complications including pneumonia, that occur post-operatively have an effect on the individuals hospital stay, cost of treatment and quality of life post-hospital discharge (Hulzebos et al., 2006). These findings suggest that post-operative complications are also associated with pre-operative condition of the patient. Thus thorough screening of patients and pre-operative physiotherapy management would be useful to ensure that chances of post-operative complications are minimal.

### **Mortality**

This study defined mortality as a death of cardiac patient before hospital discharge (Hulzebos et al., 2006). The study recorded a mortality of 11 adult patients in a period of four years which accounted for 10.5%.



Compared to other cardiothoracic settings, this mortality is low as opposed to 17.6% in Nigeria (Falase et al., 2013) and 18% in Senegal (Diop et al., 2011). However, this mortality is higher than 9.2% from Cameroon (Tantchou et al., 2011). In India, 200 cardiac surgeries were performed without any recorded hospital mortality (Kumar, 2011). However, there are signs of improvement in the setting due to the fact that previous study by Nyawawa et al. (2010) recorded a high mortality rate of 13.3%. This indicates that there is a room for improvement, thus, it is very important to learn from other experienced countries on how to reduce mortality.

During the interview, one Cardiac Surgeon reported that for the last two years, they have been involving Physiotherapists in their management as opposed to previous. However, it

cannot be concluded that the current involvement of Physiotherapists has contributed to this reduction of mortality due to the fact that, this study only focused to the adults as opposed to previous study by Nyawawa et al. (2010).

### **7.3 Process of physiotherapy care**

During the course of the study, physiotherapy care in terms of consultations, number of therapeutic sessions, and content of therapy, among others were investigated. Physiotherapy involvement in cardiac surgery has been confirmed to facilitate quick recovery and promote functional recovery (Herdy et al., 2008; Borghi-Silva et al., 2005).

#### **7.3.1 Consultations**

Since Physiotherapists are not first line practitioners in Tanzania, their involvement is dependent on the referrals from Cardiothoracic Surgeons. At MNH Cardiac Unit, this study found that only 1.0 % of patients were referred to physiotherapy pre-operatively. However, there were contradictions from the data obtained from the records and the views of cardiac surgeons. The Cardiac Surgeons argued that, they do refer patients pre-operatively and post-operatively as quoted below.

*“We consult Physiotherapist pre-operatively...so it is a duty of Physiotherapist to know that I have seen this patient pre-operatively, when is he / she going to be operated and then follow the course.”*  
*...Cardiac Surgeon 49 years of age*

Their argument was also similar to four Physiotherapists who indicated that there were more pre-operative consultations than post-operative consultations as quotation below illustrates:

*“The Cardiac Surgeons do refer to us those patients who are planning to operate. We go there, assess and conduct pre-operative sessions to those patients. Then we keep following them after the operation for exercises daily.” ...Physiotherapist P<sub>3</sub>*

On the post-operative phase, 77.7% of all adult cardiac patients operated on were referred post-operatively. Six Physiotherapists interviewed were in agreement that the majority of patients are referred post-operatively.

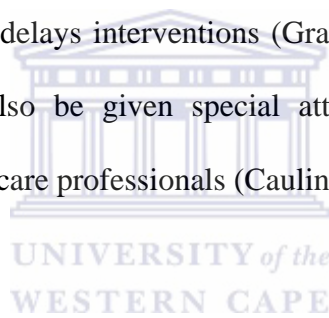
These sentiments are in stark contradiction to the qualitative results obtained in the second objective of the study. It could be contributed to by means of communication rather than the written referrals, which is the primary way of referring patients at MNH:

*“What I can see is, they just call post-operative...but they do consultation by phones. But we normally don't see any consultation notes in the files.” ...Physiotherapist P<sub>1</sub>*

The use of telephonic communication without documentation was brought out by physiotherapists. However, the researcher could not establish the credibility of this by either quantitative data or from Cardiac Surgeons as they maintained that they refer patients pre-operatively. One Cardiac Surgeon added that, previously they could not consult Physiotherapists but in the last few years, they are involving them. The participant further said...

*“...previously we used not to consult Physiotherapists pre-operatively. But after getting some mortality and very poor recovery post-operatively...they are part and parcel of all procedures.”*  
*...Cardiac Surgeon 49 years of age*

In Brazil, Lima et al. (2011) interviewed patients who were referred by doctors to physiotherapy following cardiac surgery. They then concluded that pre-operative physiotherapy can help patient reduce anxiety and fear post-operatively. However, the pre-operative and post-operative referral to cardiac rehabilitation is an issue in most countries including developed countries (Gravely-Witte et al., 2009; Cortés & Arthur, 2006). As a result, this service is under-utilised, which results in diminishing the effect of the intervention or the outcome of procedure performed. On the other hand, Lima et al., (2011) reported that in Brazil, there were only 16.7% of the patients who had interaction with the Physiotherapists prior to cardiac surgery. Although Physiotherapists in Greece conveyed that they had a chance to see all patients pre-operatively (Lomi & Westerdahl, 2013), poor referral strategies among health care professionals delays interventions (Grace et al., 2011). Moreover, it was observed that women should also be given special attention as they are the minority commonly referred by the health care professionals (Caulin-Glaser, et al., 2001).



Physiotherapists have a role to play in facilitating consultations through the use of evidence-based practice which can advocate their interventions. Norrenberg and Vincent (2000) found Physiotherapists are responsible for the situation and that they should take initiatives so as to advocate their role in cardiac surgery. In line with literature, Physiotherapists suggested that there is a need of taking initiative to face and discuss with the Cardiac Surgeons on the significance of them referring patients:

*“It is a problem but the only way we can do away from it is just to talk to the Doctor and elaborate your plan from day one and other days when you attend patients. Because if the Doctor reads you a lot that you still have programmes with the patient, they must consult you before discharge. If you don’t have plans or you didn’t show from day one, then it will be difficult for Doctor to know that you still have plan to that patient.” ...Physiotherapist P<sub>8</sub>*

Physiotherapy intervention is dependent on the consultation from the Doctors. The argument of whether pre-operative referrals are significant than post-operative is however to continue based on the doctors' perceptions on the necessity of physiotherapy in the at-risk patients from those who are not at-risk patients. Thus it remain a responsibility of Physiotherapists to practice evidence-based therapeutic techniques and proper documentation which will help doctors realise the necessity of consulting Physiotherapists in pre- and post-operative phase.

### **7.3.2 Post-operative physiotherapy sessions**

Over third (37.8%) of the patients received 3 physiotherapy sessions while 28.1% received 2 physiotherapy sessions in ICU with a mean number of 3.2 sessions (ranging from 1 to 18 sessions). The majority of the patients were attended to once a day. In the Ward, the mean number of physiotherapy sessions with the patient was 5.5 sessions (ranging from 3-18 sessions). The majority of the patients received therapy every alternative day from Physiotherapists.

During an interview, Physiotherapists argued that their workload was big and they could not attend out-patient clinic and be in the cardiac ward at the same time. In this case, issues such as workload need to be addressed to ensure that patients receive the optimum care. It was noted that:

*“...this also depends on the...workload of that day...number of patients...in that day...”*

*...Physiotherapist P<sub>10</sub>*

In Greece, patients received from 1 to 6 physiotherapy treatment sessions following cardiac surgery (Lomi & Westerdahl, 2013). Although daily physiotherapy has been reported to be effective (Lomi & Westerdahl, 2013; Mendes et al., 2010; Kehlet & Wilmore, 2002), others (Arcêncio et al., 2008) argue that there is not enough evidence to support daily physiotherapy following cardiac surgery and so it is unproven.

During weekends, not all patients have the chance to receive physiotherapy at MNH Cardiac Unit. The physiotherapists said that:

*“It is difficult to get therapists during the weekends...there is no formal way of keeping therapist during weekends for these patients.” ...Physiotherapist P<sub>1</sub>*

The situation is different in Greece whereby the majority of the patients have access to physiotherapy on Saturday and 58% on Sundays (Lomi & Westerdahl, 2013). It is therefore recommended that weekend rotations for Physiotherapists at MNH be introduced.

Literature has shown the significance of physiotherapy in reducing post-operative hospital stay. It has been found that physiotherapy intervention reduces the incidence of pulmonary infections, duration of patient in the mechanical ventilation and shortens the number of ICU stay (Castro, Calil, Freitas, Oliveira, & Porto, 2013). In a Randomized Clinical Trial (RCT) conducted by Borghi-Silva et al. (2005), it was established that, patients who received physiotherapy, had a mean hospital stay of  $6.6 \pm 1.0$  days and  $8.0 \pm 2.1$  days post-operatively. In another RCT, it was also established that the mean hospital stay for patients who received pre-and post-operative physiotherapy was  $5.9 \pm 1.1$  as opposed to  $10.3 \pm 4.6$  days with a

P-value of  $< 0.001$  (Herdy et al., 2008). Thus the study concludes that a combination of pre- and post-operative physiotherapy had positive effect in reducing hospital stay, and promoting recovery by reducing the chances of post-operative complications. However, Arcêncio, et al. (2008) are of the opinion that physiotherapy service does not bring any additional benefits to the patients either pre- or post-operatively. On the other hand, Leguisamo, et al. (2005), established the significance of pre-operative therapy by concluding that patients who receive pre-operative sessions become more co-operative and are likely to have a shorter hospital stay than others.

### **7.3.3 Content of therapy**

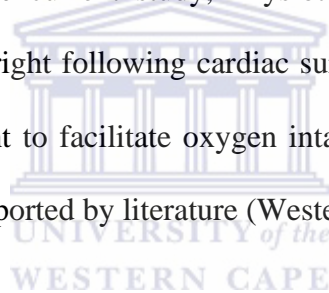
There are various therapeutic techniques reported in different countries, but this study found that the combination of breathing exercises, active limb mobilisation, spirometry plus ambulation progressively from the bed was frequently prescribed to the ICU patients (53.7%). In the post ICU phase, the current study recorded the use of combinations of breathing exercises, active limb mobilisation, endurance training, and posture correction.

Coughing with support, deep breathing and other breathing exercises are widely considered to be part of post-operative therapeutic treatment techniques (Lomi & Westerdahl, 2013; Westerdahl & Olsen, 2011). Incentive spirometry which was used by Physiotherapists in Tanzania has also been questioned following cardiac surgery (Freitas, Soares, Cardoso, & Atallah, 2012). In a systematic review (Carvalho, Paisani, & Lunardi, 2011), it was concluded that there is no sufficient evidence to support the use of incentive spirometer and that its procedure for application varies from place to place lacking standard procedure.



Early mobilisation and ambulation from the bed to sitting, and walking has also been supported by literature (Kehlet & Wilmore, 2002). Upper limb mobilisation which is also prescribed by Physiotherapists in Tanzania was also found to be in accordance with the literature in reducing sternal pain (El-Ansary, Waddington, & Adams, 2007).

Ambulation to walking has also been reported to reduce days of hospitalisation (Herdy et al., 2008; Hirschhorn et al., 2008). Another study compared walking with stationary cycling in the early post-operative phase. It was found that both techniques were on the same level of evidence if well monitored in early post-operative phase (Hirschhorn et al., 2012). In the current study, Physiotherapists were in agreement that patients should be positioned upright following cardiac surgery so as to facilitate air intake. Upright positioning of the patient to facilitate oxygen intake during the first post-operative days used in Tanzania is also supported by literature (Westerdahl & Moller, 2010).



It has been shown that physiotherapy involves a combined modalities and techniques in the management of patients undergoing cardiac surgery. Hence, it has been established that combined techniques are more effective in treatment as no evidence to support effectiveness of the specific technique (Makhabah, Martino, & Ambrosino, 2013; Urell et al., 2013). Literature has also shown the use of stair-climbing as part of endurance training to be helpful if combined with different form of physical activities, exercises and cardiac rehabilitation in general (Lomi & Westerdahl, 2013).

In Tanzania, Physiotherapists perceived that they do not have standard treatment procedure and they depend on their past working experience in managing patients following cardiac surgery. This was noted from participants who said that:

*“...we don’t have standard treatment. You go there with your technique, you perform.”*  
*...Physiotherapist P<sub>5</sub>*

The challenge of evidence-based approach for treatment regimes in area of chest-physiotherapy seems to be still present. Inwood (2002) perceives that there is no proper and standardised definition of chest physiotherapy. Arcêncio, et al, (2008) argue that chest physiotherapy for the prevention of pulmonary complications is not clear. As a result, they perceive that physiotherapy adds unnecessary costs to the patients. Lack of standard procedures could be the answer to Inwood (2002) and Arcêncio, et al, (2008). This is a challenge in the current world of an evidence-based approach. It is true that the experience of an individual is important but there must be evidence to support the practice. For instance in Greece, there was variation of 1 to 40 breath exercises that patients were instructed to perform in one to four session (Lomi & Westerdahl, 2013). In Canada, Overend et al. (2010) conducted a telephone survey which included 18 Canadian hospitals performing cardiac surgery. The survey aimed at determining physiotherapy care for adult patients following cardiac surgery. The study defined physiotherapy care in terms of education provided to the patients, mobility, and exercises prescribed to the patients. They however concluded that, there were variations of treatment techniques and some of them are not literature evidence-based. This brings a controversy among Physiotherapists globally which makes it difficult to argue for the significance of physiotherapy in the cardio-pulmonary field.

#### 7.3.4 Dosage

During an interview with Physiotherapists, all participants were in agreement that it is difficult to set a specific treatment time, as it would depend on the intensity and condition of the patient. The majority of the Physiotherapists had a range between 15 minute sessions which could progress to 60 minutes, depending on the exercise tolerance. The amount of time spent in the treatment session was another area of controversy as shown in the Chapter Six as most of Physiotherapists depends on their past experience to set a dosage.

The challenge of dosage among Physiotherapists was also reported by (Dias, et al., 2011). The study however reported that, there are variations of dosage among Physiotherapists. Although Urrel, (2013) made recommendations on the dosage of breathing exercises post-operatively; lack of literature reaching consensus in guiding post-operative physiotherapy management and dosage, is the challenge (Dias, et al., 2011).

It is therefore not clear whether exposure, working experience or education plays part in the physiotherapy plans of treatment simply because, there is a huge variation among Physiotherapists globally. In addition, no consensus in the literature exists on the appropriate techniques, dosage and intensity in both complicated and non-complicated patients following cardiac surgery. With the on-going arguments in the field of cardio-pulmonary physiotherapy, more studies in developing countries should be done. Conducting randomised clinical trials in African settings specifically East Africa and Sub-Saharan Africa; could help improve the evidence-based practice which would be beneficial for both Physiotherapists and patients at large.

## **7.4 Perceptions on the role of physiotherapy in the management of patients following cardiac surgery**

Interviews with Cardiac Surgeons and Physiotherapists unearthed a number of issues related to perception of the role the Physiotherapist can play in the management of patients following cardiac surgery.

### **7.4.1 Awareness of physiotherapy**

The two Cardiac Surgeons interviewed were fully aware of what the profession of physiotherapy is all about and when they expected Physiotherapists to intervene. Cardiac Surgeons were concerned with early involvement of physiotherapy soon after patient was extubated. They added that, Physiotherapists have a role in the pulmonary and alveolar recruitments, facilitation of gaseous exchange to the patient thus diminish reduce post-operative respiratory complications. Both Cardiac Surgeons and Physiotherapists were in agreement that physiotherapy plays a role in the management of patients following cardiac surgery.

*“...they have a great role in assessing the pulmonary function of the patient...as you know pulmonary function is the determinant of the post-operative recovery of the patient.”*

*...Cardiac Surgeon 48 years of age*

*“...the role of physiotherapy in cardiac surgery is...to make these patients improve and to have a quick recovery after the surgery and to return to their optimal function independently”. ...Physiotherapist P<sub>1</sub>*

Lomi and Westerdahl (2013) reported that, physiotherapy is significant to the patients following cardiac surgery. In their study which was conducted in Greece, they aimed at

establishing the current physiotherapy practice. Although their survey, involved Physiotherapists only which could increase chances for bias, they however found similar results that physiotherapists has a role to play for the patients following cardiac surgery. Urell et al. (2013) also reported that, Physiotherapists plays a role in facilitating patients' recovery following cardiac surgery.

Although there seems to be consensus that physiotherapy has a role to play, issues such as communication between Physiotherapists and Cardiac Surgeons at MNH Cardiac Unit should be improved to optimise the use of physiotherapy:

*“...if we improve communication...the role of every profession including physiotherapy will be known.”*  
*...Physiotherapist P<sub>1</sub>*



Communication is the key for any team work performance, especially for the patient-oriented setting (Airan, 2005; Klimoski & Jones, 1995). Improved communication can be attained by involving Physiotherapists and other members in the multidisciplinary team which will enhance harmony and performance of the team work effectiveness (Klimoski & Jones, 1995). Arcêncio, et al. (2008) maintains that there is international unanimity about the necessity of Physiotherapists in the multidisciplinary team, which involves Doctors and Nurses. Thus this harmony can be used as a primary step in helping patients post-operatively.

If communication challenges are solved, issues such as the perception of the competence of Physiotherapists could be dealt with too. The participants pursued that there is lack of consistency from Physiotherapy side. The researcher documented that...

*“I should say we have very poor service for Physiotherapists in our unit.”*  
*...Cardiac Surgeon 48 years of age*

Lack of consistence among Physiotherapists in the intensive care unit has been a challenge all along (Stiller, 2000; Norrenberg & Vincent, 2000). The competence of physiotherapy will continue to be questioned until evidence-based techniques are practiced in line with the proper documentation (Stiller, 2000). Different Physiotherapists have their individual rationale for the specific techniques they use for treatment purposes (Clini & Ambrosino, 2004). However, improper documentation and lack of evidence to support their rationale for the physiotherapy intervention do exist. This is due to the fact that there are inadequate studies which examine the long term outcome of specific physiotherapy techniques thus challenging the profession (Clini & Ambrosino, 2004). It is therefore ideal for Physiotherapists to develop the habit of using evidence-based techniques in line with appropriate documentation in order to generate confidence among other health professionals in the cardiac multidisciplinary team.

#### **7.4.2 Suggested improvements**

Some improvements were offered based on the challenges identified below by both Physiotherapists and Cardiac Surgeons. It was established that lack of continuous professional development, poor working environment, lack of facilities and equipment and the absence of a Physiotherapy Unit in the Cardiac Complex, are among the challenges which faces the unit. Other challenges identified are poor collaboration with Doctors, including Cardiac Surgeons and shortage of Physiotherapists. Cardiac Surgeons mainly focussed on the fact that no full time trained Physiotherapist is available for the MNH Cardiac Unit:

*“No really Physiotherapist who is entitled or is throughout actually taking care of those patients both pre-operative and post-operative. I mean that, a Physiotherapist who is exclusively working in the Cardiac Unit.” ...Cardiac Surgeon 48 years of age*

However, Physiotherapists, on the other hand, felt that seminars and continuous education is needed if they are expected to work solely in this field of cardio-pulmonary at MNH Cardiac Unit:

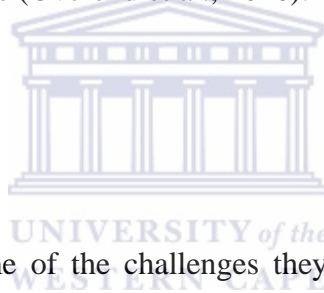
*“...when you see your fellow colleagues like nurses, Doctors and others in Cardiac Unit are given a chance to go to school, sometimes to go to the seminars, training but you Physiotherapist you're never given the chance, that makes many Physiotherapist not interested.” ...Physiotherapist P<sub>1</sub>*

Similar challenges are also reported by Physiotherapists in Greece (Lomi & Westerdahl, 2013). 31.0% of Physiotherapists in Greece reported that, they did not offer optimal physiotherapy services due to poor collaboration with Doctors, lack of education, and lack of equipment and skilled personnel in the area of cardio-pulmonary. Moreover, 89% of Physiotherapists reported that they did not have a written guideline, care plans or treatment protocols. However, the study in Greece included the entire country which limits comparison with the present study. These challenges faced by the physiotherapy profession affect their performance in providing optimum service delivery to the patients, leading to lack of confidence in the multidisciplinary team (Klimoski & Jones, 1995). To enhance performance within cardiac team, Airan, (2005) advocates that Cardiac Surgeons should help and support other health workers like nurses and Physiotherapists who are also members of cardio-pulmonary team. Although the Cardiac Surgeons would wish to support Physiotherapists and nurses; it is less practical in developing countries where there is scarcity of funds and other necessary resources required in cardio-pulmonary rehabilitation.

## **7.5 Perceptions of physiotherapists with regard to their role on the post-operative management of patients following cardiac surgery**

Physiotherapists had a clear understanding of the role they have to play in the management of patients following cardiac surgery. It was clear that, Physiotherapists knew that they have a role to play in both pre- and post-operative stages of cardiac surgery.

Lomi & Westerdahl, (2013) also reported that physiotherapists in Greece considered physiotherapy services essential for patients following cardiac surgery. However, in another study it was concluded that post-operative physiotherapy intervention in the first day is not necessary for uncomplicated cases (Overend et al., 2010). Although the question still exist on what is uncomplicated cases.



Physiotherapists highlighted some of the challenges they experience as part of their role. Some of these challenges are related to the referral system at Muhimbili National Hospital Cardiac Unit and was described earlier in this chapter.

As Airan (2005) said, politics affects the service delivery and it flows from the top down and vice versa, but health care professionals should not rely on politics; rather they should be more focussed on service delivery as the main target is to serve the purpose. This means that, the inputs from Physiotherapists and Cardiac Surgeons should focus to help the patients as a team. It is thus clear that, these suggestions should be given serious attention as patient care will be enhanced.



## CHAPTER EIGHT

### SUMMARY, CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

#### 8.1 Introduction

This chapter provides an overall summary of the study and will also highlight the limitations encountered that should be considered when interpreting the result. Recommendation for necessity and position of physiotherapy in the cardiac multidisciplinary team and future research is provided.

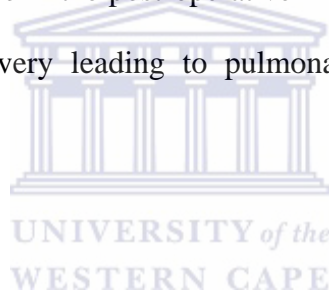
#### 8.2 Summary and conclusion

The aim of this study was to investigate the role of physiotherapy in the post-operative management of patients following cardiac surgery at Muhimbili National Hospital (MNH), Tanzania. To achieve this, the profile and process of care of patients undergoing cardiac surgery were determined. Also the perceptions of the Cardiac Surgeons and Physiotherapists with regard to the role of physiotherapy in the post-operative management of patients following cardiac surgery were explored.

Literature has shown an increasing number of people with cardiovascular disease in low, middle and high income countries in recent years, Tanzania inclusive. The incidence of cardiovascular diseases is rising significantly, not only in the developed countries but also in the countries undergoing economic transitions like Tanzania. Coronary heart disease is the major cause of cardiac surgery in industrialised countries as opposed to rheumatic heart disease, which is the leading cause of cardiac surgery in non-industrialised countries.

Tanzania is not exempt from this trend of rheumatic heart disease. Rapid urbanisation, lack of physical activity and lifestyle are among of the identified risk factors for cardiovascular diseases.

Coronary artery bypass graft is the commonest cardiac procedure reported in the developed countries as compared to rheumatic heart valve surgeries in developing countries, including Tanzania. Different health care professionals in the cardiac multidisciplinary team, including Physiotherapists have been identified to have a role to play in facilitating recovery of patients undergoing cardiac surgery. However, the literature surveyed, has shown that, less involvement of physiotherapy care in the post-operative management of cardiac patients, has been identified to hamper recovery leading to pulmonary complications and prolonged hospitalisation.



Different literature surveyed, demonstrated that lack of technology, financial constraints, lack of cardiac expertise in the field of cardiac surgery are the challenges faced by low and middle income countries in establishing, running and sustaining cardiac centres. Political instability and lack of fund to constantly import consumables for cardiac surgeries are also reported to play part in hindering the development of cardiac surgeries in the low and middle income countries, Tanzania inclusive. These challenges and others are the reasons for the failure of most developing countries to incur high costs of referring patients requiring cardiac surgery abroad.

Lack of evidence to support the necessity of physiotherapy care on the post-operative management of patients undergoing cardiac surgery in Tanzania was the motivation of this study to be carried out so as to fill the identified gap. The Cardiac Unit at Muhimbili National Hospital (MNH) in Tanzania was chosen as the research setting. A sequential explanatory mixed method was carried out employing quantitative and qualitative approaches.

A descriptive retrospective quantitative design was used to collect information of 105 patients' record files at Muhimbili National Hospital Records Department. All patients aged 18 years and above who underwent cardiac surgery in January 2010 to 31 December 2013 were conveniently sampled. A data extraction sheet adopted from literature which was modified based on research objectives, was piloted to further ensure its validity and reliability. Descriptive and inferential data was analysed using Statistical Packages for Social Sciences (SPSS) version 22.0 which was set at  $p < 0.05$  significance level.

The age of the patients ranged from 18 years to 62 years with the mean age of Mean 30.7 (SD=10.5). More than half (54.3%) of the study sample were females. Rheumatic heart disease accounted for 74.3% of all cardiac diseases. Mitral valve was involved by 71.5% of all pre-operative diagnosis confirmed by ECG. Furthermore, double valve procedures accounted for 42%. It was also noticed that, there is a decline in the number of cardiac surgeries performed from 48.6% in 2010 to 10.5% in 2013. With regard to the hospital stay, the mean number of days spent in ICU were 6.4 (SD=5.3) and post ICU in the ward were 12.2 (SD=7.8). However, total of 21.4% of the cardiac patients developed post-operative complications and 10.5% of the total sample died during the period of investigation.

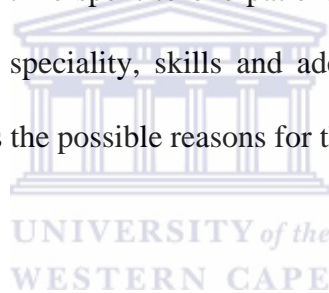
A considerable number of patients (77.7%) were referred for physiotherapy treatment post-operatively, with most of these referrals on the first day post-operatively (70.0%). The majority (37.8%) of the patients received 3 physiotherapy sessions in the ICU with most of these patients (79.3%) being seen once a day in the ICU and (65.8%) in the ward. A combination of breathing exercises, active limb mobilisation, spirometry and progressive ambulation from bed, chair to walking was frequently prescribed (53.7%) in the ICU. In the Cardiac Ward, Physiotherapists frequently (89.5%) prescribed combination of breathing exercises, active limb mobilisations, endurance training as well as posture correction.

An explorative qualitative design was used to conveniently investigate a sample two Cardiac Surgeons and ten Physiotherapists working at Muhimbili National Hospital who voluntarily accepted to take part in the study. All Cardiac Surgeons were males with working experience of seven years in the same setting. The ten Physiotherapists interviewed ranged from 32 years to 57 years in age with a mean age of 44.1 (SD=8.7) and with a mean working experience of 13.4 years (SD=8.8) at MNH for both genders. The majority of the Physiotherapists study sample was males (70%). The semi-structured in-depth interview was conducted with all participants, with regards to their perceptions on the post-operative role of physiotherapy in cardiac surgery.

All Cardiac Surgeons were aware of the role of physiotherapy in this specialised area but they reported that, there is shortcoming on the side of Physiotherapists with regards to poor service delivery. They also suggested areas of improvement to the Physiotherapists and hospital administration to improve service delivery. The suggested areas were: to train Physiotherapists in the area of cardio-pulmonary, establish Physiotherapy Unit within

Cardiac Complex and an improvement in the working environment. It was also recommended that physiotherapists should cooperate with the Cardiac Unit and adhere to helping cardiac patients while waiting for administration to attend their needs.

On the side of Physiotherapists, the respondents were in agreement that they have a role to play but they encounter challenges, including lack of a Physiotherapy Unit within the Cardiac Complex, and lack of adequate skills and exposure in the field of cardio-pulmonary rehabilitation. Poor communication among health care practitioners working in a Cardiac Unit was also mentioned. However, it was noticed that, there was variations of treatment techniques, dosage, intensity and time spent to one patient during the physiotherapy care. It was acknowledged that, lack of speciality, skills and adequate knowledge in the field of cardio-pulmonary were offered as the possible reasons for their treatment variations.



Following phase two of the study, the aim and objectives of the study were achieved, thus answering the identified research question on the role of physiotherapy in the post-operative management of patients undergoing cardiac surgery at MNH Cardiac Unit, Tanzania. Moreover, the findings of this study are supported by other studies conducted in other countries on the necessity of physiotherapy in the cardiac multidisciplinary team.

### **8.3 Limitations**

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

- The sample of this study was conveniently selected from one hospital in Tanzania and the sample size was relatively small. Thus generalisation of the findings by one statement to other Cardiac Centres, Cardiac Surgeons and Physiotherapists is limited.
- Cardiac Surgeons and Physiotherapists interviewed were all working in the same set-up at MNH. So, there could be bias from Cardiac Surgeons or Physiotherapists in giving out relevant information.
- Causal inferences cannot be made due to the limited data. The profile of patients, physiotherapy care and perceptions of both Cardiac Surgeons and Physiotherapists on the post-operative management will not necessarily continue to be the same. Therefore, caution should be exercised in interpreting the results in the absence of longitudinal data.
- Caution should be observed when direct or parallel comparison of this study is made with other studies carried out elsewhere in the world, due to different environmental, sampling, and methodological variations.
- With regard to the data collection, there is one main health record at MNH which keeps all folders. However, the Cardiac Unit, paediatrics and out-patients' have their Health Record Units within their complexes. It was a challenge to trace and access other folders, as the patient may attend different clinics using the same folder used in the Cardiac Unit.

**Personal limitation:**

- The researcher has had interest in the area of cardiac surgery, so he chose this topic in order to increase knowledge in this area. This could have an influence on the data simply because researcher has been working in a Cardiac Unit prior to the study. This

is in accord with Charmaz, (2000) who noted that the researchers are required to be objective in their personal area of research interest as the knowledge is equally made by the viewed and the viewer.

- The researcher had difficulties on how to respond to the participants, who are also colleagues working in the same environment in a way that did not influence what they did or did not share.

#### **8.4 Recommendations**

- The personnel and Tanzania Ministry of Health and Social Welfare should establish a health education programme for society on the preventive measures of cardiovascular disease. Health education should be accompanied with screening so that the identified people with cardiovascular diseases, they can begin management as early as possible.
- The government and hospital administration should train more Cardiac Surgeons, Physiotherapists, Cardiologists, among others in the field of cardiovascular management so as to improve health services.
- Muhimbili National Hospital should establish independent a Cardiac Rehabilitation Unit within the Cardiac Complex in order to improve quality of life to the patients undergoing cardiac surgery.
- Cardiac Surgeons and Physiotherapists should strengthen their communication and work closely in helping patients.
- Cardiac rehabilitation must be emphasised in physiotherapy training. The training must focus on the at-risk patients, operated patients and how to help patients improve their quality of life after hospital discharge. The Physiotherapists should also look forward to post-graduate studies especially in the cardio-pulmonary field.

- Physiotherapists should work within evidence-based approaches. They should establish treatment protocol based on evidence within the set-up and implement it. This will help reduce variations of their treatment.
- Cardiac patients should be managed with a team approach, rather than a few professional. Similarly, medical schools should incorporate the knowledge of inter-professional collaboration. This will help them as team leaders to embrace a multidisciplinary approach. An inter-professional collaboration between Physiotherapists, Doctors and other health professionals will help to stimulate team work.
- Future research is recommended to fill in the gaps on the effectiveness of physiotherapy techniques used in the cardiac rehabilitation post-operatively, the impact of pre-operative physiotherapy on the post-operative management. In Tanzania, it is however not known if cardiac patients improve functionally or they develop complications following hospital discharge. Thus, the quality of life of cardiac patients they have following hospital discharge should be researched.
- Following interview with physiotherapy, this study adds to the current definition of the role of physiotherapy in the post-operative phase 1 as to assess the pulmonary and physical function of the patient so as to plan for treatment based on the literature and available resources. It is aimed at diminishing pulmonary complications and hastens recovery through exercises that clear the airways, and facilitation of optimal functional.



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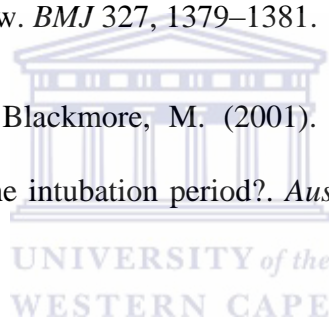
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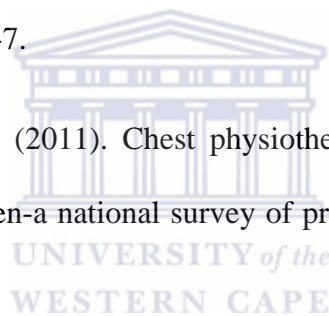
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# ADDENDUMS



## Addendum B

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Dar es Salaam,



REF: CLEARANCE AND PERMISSION TO CONDUCT RESEARCH AT MNH

I am Physiotherapist working at MNH, currently doing MSc Physiotherapy at the University of the Western Cape.

I kindly request you permission to conduct a research project as a requirement for a partial fulfilment of the MSc physiotherapy. The title of the study is **“The role of physiotherapy in the management of patients following cardiac surgery in Tanzania”**.

Find attached proposal and ethical clearance.

Your sincerely,

Abdallah R. Makalla

PF 9910

## Addendum D



# UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa  
*Tel: +27 21-959 2542, Fax: 27 21-959 1217*  
E-mail: makala232000@gmail.com

## INFORMATION SHEET: MUHIMBILI NATIONAL HOSPITAL

**Project title:** The Role of Physiotherapy in the management of patients following Cardiac Surgery in Tanzania.

### **What is this study about?**

This is a research project being conducted by Abdallah R. Makalla at the University of the Western Cape. We are inviting the Muhimbili National Hospital to participate in this research project because Muhimbili National Hospital (MNH) is the only hospital performing cardiac surgery in the country. The purpose of this research project is to investigate the postoperative role of physiotherapy in the management of patients following cardiac surgery in Muhimbili National Hospital, Tanzania. The information obtained could be used by the center to understand the postoperative role of physiotherapy which could result in promoting patients quality of life following cardiac surgery.

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

You the head of medical record department at MNH will be asked to sign consent letter, and participate by allowing researcher to access hospital database and extract the information of the patients underwent cardiac surgery in MNH from January 2010 to December 2013. The information which will be extracted includes gender, age, date of admission to hospital, diagnosis, length of hospital stay, mortality, type of treatment received (surgery), referral

procedure to physiotherapy, number of physiotherapy sessions and content of therapy. The hospital MNH will have a right to withdraw from this a study at any time and have a right to ask for more clarification on the study. This study will be conducted at MNH, Tanzania.

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

We will do our best to keep patients personal information confidential. To help protect confidentiality, the data forms will be kept in a locked filing cabinet where only researcher will have access and password-protected computer files will be opened by researcher.

The names and the information extracted from patients' folders will not be mentioned. The study will use numbers "1, 2..." for the names therefore nobody will know they're really identity. A code will be placed on other collected data. Through the use of an identification key, the researcher will be able to link the data to the identity of a subject. Only researcher will have access to identification codes. If we write a report or article about this research project, the patients' 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

**Risks of this research**

There may be some risks from participating in this research study but there are no known risks associated with participating in this research project.

**Benefits of this research**

The results may help the MNH hospital better understand the profile of the cardiac centre, and the postoperative role of physiotherapy in the management of patients following cardiac surgery at MNH. We hope that, in the future, Patients could benefit through improved process of care.

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

Muhimbili National Hospital participation in this research is completely voluntary may choose not to take part at all. If the hospital decides to participate in this research, may stop participating at any time. If hospital decides not to participate in this study or if stop participating at any time, will not be penalized or lose any benefits to which otherwise qualify.

**What if I have questions?**

This research is being conducted by Abdallah R. Makalla, a registered student in the physiotherapy department at the University of the Western Cape. If any questions about the research study itself arise, please contact:

Abdallah R. Makalla,

Mobile: +255 755 756 638

Email: [makala232000@gmail.com](mailto:makala232000@gmail.com)



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

Head of Department,

Physiotherapy department,

Dean of the Faculty of Community and Health Sciences,

University of the Western Cape,

Private Bag X17

Bellville 7535

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

## Addendum E



# UNIVERSITY OF THE WESTERN CAPE

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*Tel: +27 21-959 2542, Fax: 27 21-959 1217*  
E-mail: makala232000@gmail.com

## INFORMATION SHEET: CARDIAC SURGEON

**Project title:** The Role of Physiotherapy in the management of patients following Cardiac Surgery in Tanzania.

### **What is this study about?**

This is a research project being conducted by Abdallah R. Makalla at the University of the Western Cape. We are inviting you to participate in this research project because you're among of the cardiac surgeons involved in the management of the cardiac surgery patients in Muhimbili National Hospital. The purpose of this research project is to investigate the postoperative role of physiotherapy in the management of patients following cardiac surgery in Muhimbili National Hospital, Tanzania. The information obtained could be used by the center to understand the role of physiotherapy which could result in promoting patients quality of life following cardiac surgery.

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

You will be asked to sign consent letter, and participate in this study. You will be interviewed for 45 to 60 minutes on your perception on the postoperative role of physiotherapy in the management of patients following cardiac surgery at Muhimbili National Hospital (MNH). The interview will be audio recorded and there will be a research assistant to help take notes.

This study will be conducted at MNH, Tanzania. You will have a right to withdraw from this study at any time and have a right to ask for more clarification on the study.

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

We will do our best to keep your personal information confidential. To help protect confidentiality, you will be requested not to mention your name during interview. This research project involves making audiotapes of you in order to be accurate on the information you said. The audio tapes will be kept in a locked filing cabinet where only researcher will have access. The audiotapes will be destroyed after the process of writing a final report. The study will use letters “Z, Y...” for the names therefore nobody will know who gave the information. Through the use of an identification key, the researcher will be able to link your information to your identity and only researcher will have access to identification codes. 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

**Risks of this research**

There may be some risks from participating in this research study but there are no known risks associated with participating in this research project.

**Benefits of this research**

This research is not designed to help you personally. We hope that, in the future, other people might benefit from this study through improved understanding of the postoperative role of physiotherapy in management of patients following cardiac surgery. Patients could benefit through improved process of care.

**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.

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

In case of severe injury, you will be referred to the appropriate person. The researcher will make follow up.

**What if I have questions?**

This research is being conducted by Abdallah R. Makalla, a registered student in the physiotherapy department at the University of the Western Cape. If any questions about the research study itself arise, please contact:

Abdallah R. Makalla,

Mobile: +255 755 756 638

Email: [makala232000@gmail.com](mailto:makala232000@gmail.com)



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

Head of Department,

Physiotherapy department,

Dean of the Faculty of Community and Health Sciences,

University of the Western Cape,

Private Bag X17

Bellville 7535

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



## Addendum F



# UNIVERSITY OF THE WESTERN CAPE

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*Tel: +27 21-959 2542, Fax: 27 21-959 1217*  
E-mail: makala232000@gmail.com

## INFORMATION SHEET: PHYSIOTHERAPIST

**Project title:** The Role of Physiotherapy in the management of patients following Cardiac Surgery in Tanzania

**What is this study about?**

This is a research project being conducted by Abdallah R. Makalla at the University of the Western Cape. We are inviting you to participate in this research project because you're among of the physiotherapists stakeholders involved in the management of the cardiac surgery patients in the Muhimbili National Hospital. The purpose of this research project is to investigate the post-operative role of physiotherapy in the management of patients following cardiac surgery in Muhimbili National Hospital, Tanzania. The information obtained could be used by the Muhimbili National Hospital and health professionals to understand the postoperative role of physiotherapy which could result in promoting team work and thus improve service delivery to the patients.

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

You will be asked to sign consent letter, and participate in this study. You will be interviewed for 45 to 60 minutes on your perception on the postoperative role of physiotherapy in the

management of patients following cardiac surgery at Muhimbili National Hospital (MNH). The interview will be audio recorded and there will be a research assistant to help take notes. You will have a right to withdraw from this study at any time and have a right to ask for more clarification on the study. This study will be conducted at MNH, Tanzania.

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

We will do our best to keep your personal information confidential. To help protect confidentiality, you will be requested not to mention your name during interview. This research project involves making audiotapes of you in order to be accurate on the information you said. The audio tapes will be kept in a locked filing cabinet where only researcher will have access. The audiotapes will be destroyed after the process of writing a final report. The study will use letters “A, B...” for the names therefore nobody will know who gave the information. Through the identification key, the researcher will be able to link your information to your identity and only researcher will have access to identification key. 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

**Risks of this research**

There may be some risks from participating in this research study but there are no known risks associated with participating in this research project.

**Benefits of this research**

This research is not designed to help you personally. We hope that, in the future, other people might benefit from this study through improved understanding of the postoperative role of physiotherapy in management of patients following cardiac surgery. Patients could benefit through improved process of care.

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

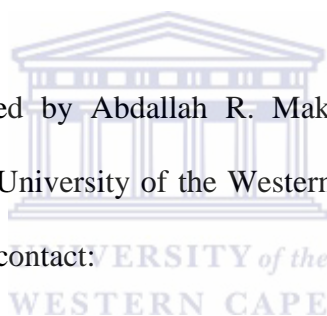
Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized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

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

In case of severe injury, you will be referred to the appropriate person. The researcher will make follow up.

**What if I have questions?**

This research is being conducted by Abdallah R. Makalla, a registered student in the physiotherapy department at the University of the Western Cape. If any questions about the research study itself arise, please contact:



Abdallah R. Makalla,

Mobile: +255 755 756 638

Email: [makala232000@gmail.com](mailto:makala232000@gmail.com)

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

Head of Department,

Physiotherapy department,

Dean of the Faculty of Community and Health Sciences,

University of the Western Cape,

Private Bag X17

Bellville 7535

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

**Addendum G**



**UNIVERSITY OF THE WESTERN CAPE**

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E-mail: makala232000@gmail.com

**CONSENT FORM: MUHIMBILI CARDIAC UNIT**

**Title of Research Project:** The Role of Physiotherapy in the management of patients following Cardiac Surgery in Tanzania

The study has been described to us MNH Cardiac Unit in language that we understand and we freely and voluntarily agree to participate. Our questions about the study have been answered. We understand that records of patients will not be disclosed and that we may withdraw from the study without giving a reason at any time and will not negatively affect the hospital in any way.

**Participant's name (On behalf of MNH Cardiac Unit) .....**

**Participant's signature (on behalf of MNH Cardiac Unit).....**

**Witness.....**

**Date.....**

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

Study Coordinators:

Prof Julie Phillips and Mrs. Farhana Karachi

University of the Western Cape

Private Bag X17, Bellville 7535

Telephone: +27 21 959 2911

Email: [jphillips@uwc.ac.za](mailto:jphillips@uwc.ac.za), and [fkarachi@uwc.ac.za](mailto:fkarachi@uwc.ac.za)



**Addendum H**  
**UNIVERSITY OF THE WESTERN CAPE**

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E-mail: [makala232000@gmail.com](mailto:makala232000@gmail.com)

**CONSENT FORM**

**Title of Research Project:** The Role of Physiotherapy in the management of patients following Cardiac Surgery in Tanzania

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**.....

**Witness**.....

**Date**.....

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

Study Coordinators:

Prof Julie Phillips and Mrs. Farhana Karachi

University of the Western Cape

Private Bag X17, Bellville 7535

Telephone: +27 21 959 2911

Email: [jphillips@uwc.ac.za](mailto:jphillips@uwc.ac.za), and [fkarachi@uwc.ac.za](mailto:fkarachi@uwc.ac.za)

## ADDENDUM J

### DATA EXTRACTION SHEET

Data Sheet number.....

#### Section A: Socio-demographic information

1.1 Hospital number: \_\_\_\_\_

1.2 Age \_\_\_\_\_

1.3 Gender:

Male  Female

1.4 Cardiac Disease (pre-operative): \_\_\_\_\_

1.5 Pre-operative Diagnosis (confirmed by ECG): \_\_\_\_\_

1.6 Type of Surgical Procedure: \_\_\_\_\_

#### Section B: Hospital stays in Days

2.1 Pre-operative hospital stays: \_\_\_\_\_

2.2 Post-operative ICU stays: \_\_\_\_\_

2.3 Post-operative Ward stays: \_\_\_\_\_

#### Section C: Post-operative Outcome of Management

3.1 Developed Complications:

Yes  No

If yes; type of post-operative complication:

3.2 Discharged home:

Yes  No

3.3 Died:

<b>Theatre</b>	
<b>ICU</b>	
<b>Ward</b>	

**Section D: Process of Care**

4.1 Referral to Physiotherapy (Pre-operatively):

Yes  No

If yes, how many days after hospital admission: \_\_\_\_\_

4.2 Referral to Physiotherapy (Post-operatively):

Yes  No

If yes, how many days after surgery: \_\_\_\_\_

4.3 Number of Physiotherapy sessions:

4.3.1 Pre-operative: \_\_\_\_\_

4.3.2 Post-operative:  
ICU: \_\_\_\_\_  
Post ICU in the Ward: \_\_\_\_\_

4.4 Intervals of therapeutic sessions in days:

4.4.1 Pre-operative: \_\_\_\_\_

4.4.2 Post-operative:  
ICU: \_\_\_\_\_  
Post ICU in the Ward: \_\_\_\_\_

4.5 Length of physiotherapy sessions (in minutes):

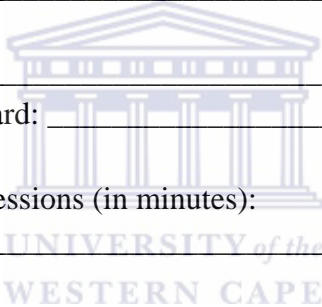
4.5.1 Pre-operative: \_\_\_\_\_

4.5.2 Post-operative:  
ICU: \_\_\_\_\_  
Post ICU in the Ward: \_\_\_\_\_

4.6 Content of physiotherapy techniques:

4.6.1 Pre-operative:  
\_\_\_\_\_  
\_\_\_\_\_

4.6.2 Post-operative:  
ICU:  
\_\_\_\_\_  
\_\_\_\_\_  
Post ICU in the Ward:  
\_\_\_\_\_  
\_\_\_\_\_



## **ADDENDUM K**

### **SEMI-STRUCTURED INTERVIEW GUIDE: CARDIAC SURGEONS**

Correspondence number.....

Age completed in years.....

Gender.....

Working experience completed in years.....

**1. Can you tell us about the MNH cardiac unit?**

- What are the types of cardiac surgeries performed here?

**2. What do you know about physiotherapy as a profession?**

- Do you think they have a role to play in cardiac surgery? If yes, would you elaborate their role in post-operative management of patients following cardiac surgery?

**3. How do you perceive the work of physiotherapists in cardiac surgery?**

- Under what circumstances makes you consult physiotherapists postoperatively

**4. What areas do you suggest that should be improved by physiotherapists?**

**5. Is there anything else you would like to add?**

Thank you for participating in the interview



## ADDENDUM L

### SEMI-STRUCTURED INTERVIEW GUIDE: PHYSIOTHERAPISTS

Correspondence number.....

Age completed in years.....

Gender.....

Working experience completed in years.....

**6. What do you know about physiotherapy role in cardiac surgery?**

- Can you elaborate more on the role of physiotherapy in post-operative management of cardiac surgery?

**7. How do you get involved in the management of patients following cardiac surgery**

- When do you receive consultation?
- How do you respond to consultations?
- How long do you take to respond to the consultation?

**8. What type of exercises do you often prescribe?**

- Pre-operative
- Post-operative (acute) in ICU
- Post-operative Sub-acute in ward

**9. Do you think there is any significant difference between the patients who received physiotherapy and those who did not, if yes, can you elaborate more, and if no, why do you think so?**

**10. What are the challenges are you facing in exercising your role?**

- Patients
- Cardiac Surgeons
- Fellow Physiotherapists

**11. In the current set up, which areas do you suggest should be improved on?**

**12. Is there anything else you would like to add?**

Thank you for participating in the interview