

**THE UTILISATION OF CHEST PHYSIOTHERAPY SERVICES AT THE
UNIVERSITY TEACHING HOSPITAL OF BUTARE, IN RWANDA**

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**A mini-thesis submitted in partial fulfillment of the requirements for degree of
Master of Science in Physiotherapy, Department of Physiotherapy, Faculty of
Community and Health Sciences, University of the Western Cape**

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November 2008

KEYWORDS

- Chest physiotherapy
- Hospital
- Utilisation
- Respiratory problems
- Medical records
- Referral
- Treatment
- Airway obstruction
- Retrospective study
- Rwanda.



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ABSTRACT

Worldwide respiratory problems are one of the common causes of acute and chronic diseases of the respiratory system that result in activity limitation and participation restriction. It hypothesised that more patients suffering from respiratory problems could benefit from chest physiotherapy (CPT) at the University Teaching Hospital of Butare in Rwanda than during the past situation. Thus, the main purpose of this study was to investigate the utilisation of, and the need for chest physiotherapy at the UTH of Butare, in Rwanda. The objectives were: (i) To determine the prevalence of respiratory problems from a selected sample of patients at UTH of Butare in 2006; (ii) To determine the monthly referral rate of patients with respiratory problems for chest physiotherapy during 2006; (iii) To determine the trends in patient referrals for CPT by physicians at UTH; and (iv) To determine factors associated with patient referral to, and utilisation of CPT. A retrospective study design, using a quantitative and descriptive research method was chosen. Medical files of patients and the register of patients treated in the physiotherapy department during 2006 were analysed. Systematic random sampling was used to select 716 files. A self-administered questionnaire (with closed-ended questions) was used to determine patient referral trends for chest physiotherapy among physicians at the UTH. Most of the physicians (75%) referred between 1 and 5 patients per week and most (95%) of physicians indicated their need to know more about CPT. Ethical issues relating to confidentiality of information were respected by the researcher. Descriptive statistics were employed to analyse the nominal data collected from a sample of 700 patients which found that 44.6% (n= 312) had positive respiratory signs with only 8.3% (n= 58) being referred for CPT during 2006. Only 56 patients had received CPT during 2006. The

results could lead to more patients with respiratory problems being referred for chest physiotherapy by the medical staff. It could also motivate physiotherapists to market this area of service among the different health professions at the UTH of Butare.



DECLARATION

I hereby declare that “**The utilisation of chest physiotherapy services at the University Teaching Hospital of Butare in Rwanda**” is my own work, that it has not been submitted, or a part of it, for any degree or examination in any other university, and all the sources I have used or quoted have been indicated and acknowledged by means of complete references.

Gasaraba Rudakenga Sylvain

Signature.....

November 2008

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DEDICATION

I dedicate this mini thesis to my wife, Tuyisenge Jacqueline B, to whom I am eternally grateful for her love, patience and support through my life, especially my studies, and to my lovely children Mpano Longin, Umulisa Jessica, Ineza Armel, Muhizi Eulade and Bihogo Arsene who prayed for success of this work and especially for their patience during my absence.



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LIST OF ABBREVIATIONS

CPT	Chest physiotherapy
UTH	University Teaching Hospital
HRQOL	Health related quality of live
DALYs	Disability- adjusted life years
CRD	Chronic respiratory disease
COPD	Chronic obstructive pulmonary disease
CF	Cystic fibrosis
HIV	Human Immunodeficiency Virus
AIDS	Acquired Immune Deficiency Syndrome
CD4	Types of white blood cells
RCTs	Randomised control trials
FETs	Forced expiratory techniques
ARI	Acute respiratory illness / infection
RSV	Respiratory syncytial virus
IPPB	Intermittent positive pressure breathing
CPAP	Continuous positive airway pressure
FVC	Forced vital capacity
FEV₁	Forced expiratory volume in one second
VC	Vital capacity
TV	Tidal volume
TLC	Total lung capacity
FRC	Functional residual capacity

V/P	Ventilation / perfusion
ICU	Intensive care unit
LRTI	Lower respiratory tract infection
PCP	Primary care physicians
NIH	National Institute of Health
WHO	World Health Organisation
UK	United Kingdom
SPSS	Statistical Package for Social Sciences



CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

This chapter presents the background to the study, the statement of the problem, the research question, the aim and objectives of the study, its significance and motivation. It ends with the definitions of relevant terms used.

1.2 BACKGROUND OF THE STUDY

Worldwide acute and chronic respiratory pathologies are among the diseases that result in activity limitation and participation restriction (WHO, 2001). Physiotherapy is one of the interventions in the management of patients with acute and chronic respiratory problems. Thus, the main purpose of this study was to investigate the utilisation of, and the need for chest physiotherapy services at the University Teaching Hospital (UTH) of Butare in Rwanda. The study was carried out within the framework of evidence-based clinical practice and the problem-solving approach in dealing with respiratory dysfunction.

Diseases of the respiratory system have existed for a long time and continue to exist worldwide. In the 1950s, the burden of morbidity and mortality arising from chronic respiratory diseases was recognised and epidemiological investigations were undertaken to determine the frequency and

causes of these disorders (Hensley & Saunders, 1989). According to Calvely and Pride (1985), the ultimate function of the respiratory system is to exchange oxygen for meeting the metabolic needs of the body; thus respiratory disorders can impede that gaseous exchange. Chest physiotherapy is intended to facilitate expectoration, hence decongest the respiratory tract. It is also known that many people suffering from respiratory diseases can obtain relief with the help of medication and chest physiotherapy (Calvely & Pride, 1985).

In 1994, the National Institute of Health (NIH) workshop on pulmonary rehabilitation formulated a working definition for pulmonary rehabilitation. It was conceptualised as a multidisciplinary continuum of services directed at persons with pulmonary disease, including their families; usually by an interdisciplinary team of specialists, with the goal of achieving and maintaining the individual's maximum level of independence and function in the community. Pulmonary rehabilitation is predominantly concerned with issues of activity limitations and participation restrictions (N I H, 1994).

Breathing exercises, as a treatment method for patients with respiratory diseases, is not a new concept. It existed even before 1895 when exercises were recognised to be beneficial in the management of respiratory disorders. Chest physiotherapy (CPT) is usually given to patients who are mechanically ventilated or those patients on prolonged bedrest, to aid in the clearance of retained pulmonary secretions; to recruit the collapsed distal lung units and to optimise the matching of ventilation and perfusion (Barker & Adams, 2002). The goals of chest physiotherapy are to remove or prevent accumulation of pulmonary secretions, re-expansion of lung tissue and control breathing, all of which improve bronchial hygiene and pulmonary function. Chest

physiotherapy is also administered to patients to prevent lung tissue from collapsing, to reduce medication usage, increase mucus transport and reduce the period of hospital stay (Blodgett, 1987). Physiotherapy can enhance independence and quality of life, as well as improve the physical and psychological well being of individuals with respiratory problems (Blodgett, 1987).

Chest physiotherapy has for a long time played an important role in assisting the clearance of airway secretions and it usually starts as soon as the patient is diagnosed with a respiratory dysfunction (Garrod & Jadwiga, 2002). Chest physiotherapy is mostly an airway clearance technique that combines manual techniques on the chest wall and it uses a strategy for positioning patients for mucus drainage with Forced Expiratory Techniques (FETs). Also, cough and breathing techniques are applied (Balachadran, 2005; Hough, 1991). According to Denehy, Carroll, Ntoumenopoulos and Jenkins (2001), the aim of chest physiotherapy in abdominal surgery population is to minimise pulmonary complications, thereby reducing patient morbidity and preventing prolonged hospital admissions. To meet this objective, physiotherapists use a variety of techniques designed to improve lung volumes and to clear bronchial secretions. Pryor and Webber (1999) argue that the techniques for augmenting the normal mucociliary movements and cough mechanisms for clearance of the lungs are not new. However, in more recent years, many of them have been improved and found to be effective, comfortable and can be used in the majority of children and adults (Pryor & Webber 1999). For example, deep breathing exercises are often considered a useful technique for increasing the effectiveness of coughing in patients with tetraplegia or neuromuscular disorder (McIlwaine, 2007). These breathing techniques allow expiratory airflow to mobilise secretions upwards in the airways and incorporate breathing strategies to assist in ventilation. It has also been found that when

breathing exercises are used in addition to an airway clearance technique, they enhance the secretion removal and an overall benefit to the patient is derived (McIlwaine, 2007).

In addition, chest physiotherapy incorporates pain management, physical activity with breathing control, use of mechanical aids, education on self-care and relaxation. It has been helpful in the management of problems associated with airflow obstruction such as chronic obstructive pulmonary diseases (COPDs), asthma, chronic bronchitis, and emphysema. Other conditions are acute and chronic chest infections and respiratory problems associated with major surgery and prolonged bed rest in different diseases (Hough, 1991).

Most chest physiotherapy techniques require the involvement of the physiotherapist or trained family member to assist the patient to breathe maximally or drain unwanted secretions from the lungs towards the airways. These include postural drainage, shaking, percussions and vibrations to the chest wall and effective coughing. These methods of treatment help to eventually give the individual with respiratory dysfunction more independence in the management of his or her respiratory problems (Van der Schans, Prasad & Main, 2000).

A study by Dubin and Virinia (1995) showed that in Africa, tuberculosis is one of the most prevalent opportunistic pulmonary infections among patients with HIV/AIDS. In Rwanda, tuberculosis was found in nearly 12% of the population. Furthermore, nearly 70% of men and women over the age of 25 were active smokers, and most of them used pipes to smoke the locally grown tobacco. The same authors found that pneumonia and chronic lung diseases are among the most common diseases in hospitalised elderly patients at the UTH of Butare.

Asthmatic symptoms were also found to be common in young adult patients in that same hospital. It is within this context that the present study investigates whether more patients, potentially in need of chest physiotherapy, can benefit from chest physiotherapy at the UTH of Butare.

The interest and motivation for this study arose from the researcher's own professional experience after twelve years of working with patients with respiratory problems, who have been referred for chest physiotherapy at the UTH of Butare. Chest physiotherapy was found to be beneficial during various stages of the respiratory problems, especially when the patients came early for the treatment. However, the researcher also observed that not many patients were referred for chest physiotherapy and this was a cause for concern.

1.3 STATEMENT OF THE PROBLEM

During the researcher's twelve years of experience as a physiotherapist at the UTH of Butare, he became aware that relatively small numbers of patients were being referred from within the hospital for chest physiotherapy. It is the researcher's perception that more patients at the UTH could benefit from chest physiotherapy treatment than those currently referred.

This observation motivated the researcher to investigate and examine whether or not there is a discrepancy between the need for, and utilisation of chest physiotherapy at the UTH of Butare, and whether more patients could benefit from chest physiotherapy.

Chest physiotherapy is indicated in a wide range of respiratory disorders ranging from primary to secondary respiratory conditions. The primary respiratory conditions are usually the main cause for admission whilst the latter are associated with other conditions such as major surgery and prolonged bed rest.

1.4 RESEARCH QUESTION

The study seeks to address the following research questions:

1. What are the respiratory problems frequently treated by physiotherapists at the UTH of Butare in Rwanda?
- 2 Is it possible for the UTH of Butare to provide chest physiotherapy services to more patients than is currently the situation?

1.5 AIM OF THE STUDY

The aim of this study was to determine the utilisation of chest physiotherapy services at the UTH of Butare in Rwanda.

1.6 OBJECTIVES OF THE STUDY

In order to meet the aim of the study the following objectives were identified:

1. To determine the prevalence of respiratory problems from a selected sample of patients at the UTH of Butare in 2006;

2. To determine the monthly referral rate of patients with respiratory problems for chest physiotherapy in 2006;
3. To determine trends in patient referrals for CPT by physicians at the UTH, and
4. To determine factors that could be associated with patient referral to, and utilisation of CPT

1.7 SIGNIFICANCE OF THE STUDY

As soon as the patient suffers from a respiratory dysfunction, physiotherapy is important to clear the airways of retained pulmonary secretions. In this way, atelectasis, chest infections and the need to prescribe expensive medication are avoided. A further aim of chest physiotherapy is to minimise situations that can lead to the activity limitations and participation restrictions experienced by patients with respiratory dysfunction. Chest physiotherapy can therefore contribute towards improving cardio-respiratory efficiency, and providing psychological and physical benefits. It is expected that the results of the study may increase the awareness among nurses and medical staff, of the role of chest physiotherapy in the management of patients with respiratory dysfunction at the UTH of Butare. The study could also highlight the need for the physiotherapy department to market respiratory physiotherapy services amongst the hospital staff. However, this marketing should be based on evidence indicating the benefits of chest physiotherapy.

Improved utilisation of CPT for patients may have an impact on the reduction of drug prescription, the period of hospitalisation, and the cost of patient management. Physiotherapy should not only concentrate their efforts on short-term curative interventions, which are mainly

directed at impairment and pathology, towards health promotion for active healthy cardio-respiratory function in improving the quality of life in patients with respiratory dysfunction.

1.8 SUMMARY

Chapter one provided the introduction and the background of this study. In this chapter the genesis of chest physiotherapy and the role of physiotherapy in managing respiratory problems are described. A general picture of respiratory problems as a global public health burden is also described. Furthermore, it highlights the motivation of the study and current status of the utilisation of chest physiotherapy at the UTH of Butare in Rwanda. The chapter ends with the definition of terms used in the study and an overview of the remaining chapters.

1.9 DEFINITION OF TERMS RELATED TO THE STUDY

In the context of this particular study, namely the utilisation of chest physiotherapy services at the UTH of Butare in Rwanda, the following terms are explained.

Physiotherapy: Physiotherapy, also known as Physical Therapy, is a group of services provided by a healthcare professional that uses specialised physical interventions such as manual therapy, exercise therapy, hydrotherapy, electrotherapy etc., in the management of musculoskeletal, movement, cardio-respiratory and developmental disorders. It can help to restore physical health that has been lost due to disease, injury, or other causes. The goals of physiotherapy are to relieve pain, and to prevent some complications due to diseases, and promote fitness and health (Campbell, Van der Linden, & Palisano, 1994).

Utilisation: Making practical and effective use of services in relation to access to health care services, and that utilisation reflects the extent to which potential access is converted into realised access (Aday & Andersen, 1981).

Chest physiotherapy: Involves the use of techniques to improve the function of the lungs and to enhance airway clearance; these include postural drainage, breathing exercises for relaxation and improving ventilation to atelectatic areas, gas exchange, percussion and vibration to the chest wall for increasing mucociliary clearance, and forced expiratory techniques (FETs) such as coughing to clear pulmonary secretions towards the airways from the lung (Tecklin, 1989).

Primary respiratory condition: refers to patients whose first diagnosis is pathology of respiratory system e.g. pneumonia, asthma, COPD and an acute worsening of respiratory symptoms which is often described as an exacerbation associated with a significant increase in mortality, hospitalisation, and health-care utilisation (Roisin, 2000).

Secondary respiratory condition: Refers to a respiratory complication developing after e.g. major surgery, bedrest, trauma and unrelated medical conditions. Secondary respiratory conditions have an impact on morbidity and mortality as many of these respiratory complications are potentially preventable and amenable to treatment, with the best outcome in the case where treatment is applied early (Richards, Waites, Chen, Kogos, & Schmitt, 2004).

Airflow limitaton: It is a condition characterised by airflow limitation that is not fully reversible. The airflow limitation is usually both progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases or allergens (Mannino, 2003).

Referral: Can be defined as any process in which health care providers who lack the skills or the facilities to manage care, seek the assistance of the provider who is better equipped or specially

trained to guide them in managing or taking over responsibility for a particular episode of a clinical condition in a patient (Al-Ansary, & Al-Rajeh, 1994).

Retrospective study: A backward – looking review of the characteristics of a group of individuals in relation to morbidity, embracing some aspects or dealing with past events in time usually using medical records, with patients who are already known to have a disease. The main purpose is making observations and drawing conclusions about patients or a disease or treatment (Martin, 1998).

1.10 SUMMARY OF CHAPTERS

This mini thesis consists of six chapters. Chapter one provides the introduction and background. Chapter two is the study of the literature which explores the problems associated with respiratory dysfunction, role and effectiveness of chest physiotherapy in respiratory dysfunction. Chapter three describes the methodology used in this study. The results are presented in chapter four. In chapter five the results are discussed in relation to relevant literature. Finally, the conclusion, recommendations of this study and limitations based on the results are presented in chapter six,

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter published research and related literature on respiratory dysfunction worldwide, with specific reference to Africa and Europe are reviewed. It explores issues such as the burden of respiratory disease and the role of physiotherapy in the management of patients with respiratory problems. This literature review is undertaken within the context of the pathophysiological aspects and burden of respiratory diseases, as well as a problem-based approach used in chest physiotherapy. Since the cardiovascular- and- pulmonary systems are so interdependent, the terms chest physiotherapy and cardiorespiratory physiotherapy are used interchangeably.



2.2 PATHOPHYSIOLOGY OF RESPIRATORY DYSFUNCTION

Diseases of the respiratory system may affect any of the structures and organs that have to do with breathing. These are the nasal cavities, throat, larynx, trachea, airways and the lung tissue (Jones, 1997). Respiratory illness is related to retained inflammatory pulmonary secretions and microbes that cause obstruction, damage of the airways and recurrent infection more than this also ventilation. There are specific signs and symptoms characteristic of bronchiectasis, such as cough, dyspnoea and wheezing (Barker, 2002). The airway infection is primarily a disease of the

bronchi and bronchioles involving a vicious circle of transmural infection and inflammation of the lungs and airway structures (Willis & Prasad, 1999). Where mucus transportation is impaired this may lead to retention of secretions, localised airway obstruction and collapse of lung tissue distal to obstructed airways (Anderson & Jenkins, 1993).

Sputum is material produced by expectoration from the bronchopulmonary system. Excessive production of sputum by a patient is indicative of ongoing bronchitis that can reveal important clinical information concerning the type and level of the inflammatory process, the extent of bronchial mucosal damage, and identification of the pathogenic microorganisms that may be present in the structures of airways (Kim, 1997). Sputum expectoration is considered abnormal because in healthy people daily secretions are swallowed (Hough, 1991).

Submucosal glands, which are present wherever there is cartilage, are located between the cartilage and surface epithelium, and are responsible for producing most of the mucus in the large airways. In a normal adult, the area occupied by glands constitutes about 12% of the wall, whereas in children that area is about 17%. The importance of this is that mucus hypersecretory states might be of greater consequence in children than adults because adults are able to cough sputum out (Schechter, 2007).

In chronic respiratory disorders, most of the lung function impairment is permanent; the airflow limitation is usually both progressive and associated with the abnormal inflammatory response of the lungs to noxious particles or gases (Halpin, 2003). Airflow limitation leads to non-homogeneous ventilation, while alveolar wall destruction and changes in pulmonary vessels

reduce the surface area available for gaseous exchange. Hypercapnia, which is a state of carbon dioxide retention in the blood, is a late manifestation and may cause reduction in ventilatory drive. Pulmonary hypertension reflects pulmonary vasoconstriction due to hypoxia in poorly ventilated lungs and vasoconstrictor peptides produced by inflammatory cells (McKenzie, 2006).

2.3 MORBIDITY AND MORTALITY OF RESPIRATORY DISEASES

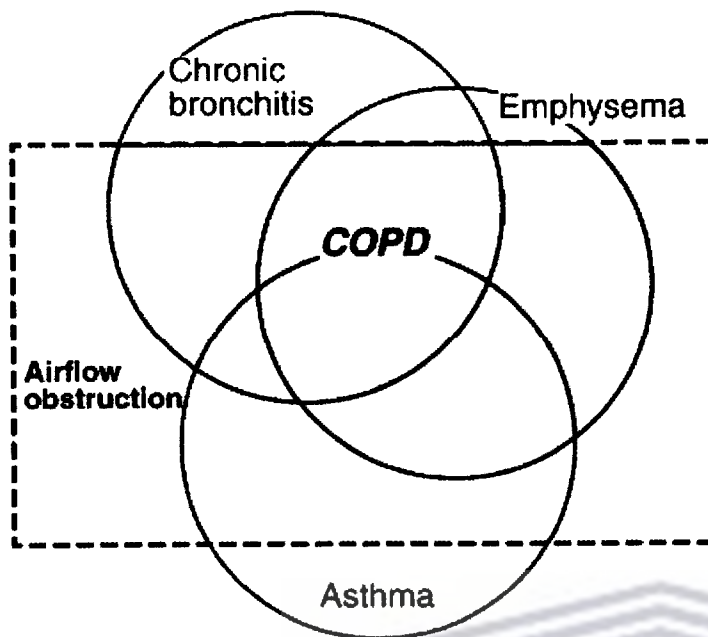
Illness and death resulting from respiratory problems account for a large proportion of the health care costs. An increase in the incidence and prevalence of respiratory conditions has been clearly associated with a sharp rise in hospital admissions because of pneumonia, bronchitis and asthma (Schwartzman et al, 2001). Pulmonary complications are the leading cause of morbidity and mortality following major abdominal surgery (Romanini, et al. 2007).

Mortality and morbidity resulting from chronic obstructive pulmonary disease (COPD) are projected to increase in all countries, including those in Africa (WHO, 2001). For example, chronic obstructive pulmonary disease prevalence in hospitals and specialised services ranged between 2.7% in Guinea, to 14% in Morocco (WHO, 2001). According to a 2006 report of the European Respiratory Society in Belgium, COPD is a condition that causes a gradual restriction of pulmonary airflow and consequent difficulty in breathing. Because of this, shortness of breath, coughing and sputum production are common symptoms.

Chronic obstructive pulmonary disease is currently the fourth biggest cause of death in Europe and is predicted to become the third biggest worldwide by 2020. Chronic obstructive pulmonary

disease is a highly prevalent disease, which leads to significant morbidity and mortality. A recent survey demonstrated that COPD prevalence in North America and Western Europe ranges from 6-8 % in male smokers above 45 years. Moreover, the average patient did not utilise treatment such as bronchodilators and inhaled steroids that might alleviate their symptoms and improve their quality of life. Only a minority, to avoid hospitalisation, took medications such as influenza vaccination, or participated in health promotion activities such as education, smoking cessation and rehabilitation (Descramer, Bartsch, Pauwels, & Yermault, 2003).

A patient with COPD has reduced peak expiratory flow, at 25%, 50% and 75% of vital capacity compared with the normal range, which is 80% to 100%, and shows minimal response to bronchodilators. Patients with asthma show incomplete, but substantial, reversibility of expiratory flow limitation across the range of vital capacity. Chronic obstructive pulmonary disease is characterised by airway inflammation, airway narrowing due to bronchospasm and airflow limitation that is not fully reversible. It is a progressive, disabling disease with serious complications that are major burdens for healthcare professionals and patients themselves. Small-airway narrowing and emphysema caused by smoking are the common conditions resulting in COPD (McKenzie, 2006).



A figure showing overlaps of bronchitis, emphysema and asthma within chronic obstructive pulmonary disease (McKenzie, 2006).

A reduction of the burden of COPD requires better evaluation and diagnosis, as well as improved management of chronic symptoms. As exacerbations and hospitalisations represent an important cost and morbidity of COPD, priority should be given to interventions aimed at delaying the progression of disease, preventing exacerbations, and reducing the risk of respiratory failure to alleviate the clinical and economic burden of disease (Halpin & Miravittles, 2006).

The identification of a respiratory exacerbation is even more complex in patients with bronchiectasis than in patients with COPD. In chronic obstructive pulmonary disease, a worsening of dyspnea and an increase in the volume and purulence of sputum are often used as criteria for identifying exacerbations. In patients with chronic bronchiectasis, sputum is chronically purulent (Barker, 2002).

In Switzerland a third of paediatricians prescribe chest physiotherapy in case of acute bronchiolitis on a regular basis for inpatients; the paediatric respiratory physicians tend to use more bronchodilators and corticosteroids as well as antibiotics and chest physiotherapy than the general paediatricians (Barben & Hammer, 2003). Chronic respiratory disease (CRD) is a chronic disease of the structures of the lungs. Some of the most common respiratory diseases from CRD are asthma, COPD, respiratory allergies, occupational lung diseases and pulmonary hypertension (Halpin, 2003).

A study by Pasquina, Tramèr, Granier, and Walder, (2006) in the United States of America, found that every year more than 4 million abdominal surgeries are performed. Patients undergoing abdominal surgery are at increased risks for pulmonary complications postoperatively which increase hospital morbidity, prolong hospital stay, and contribute to additional health-care costs.

Postoperative pulmonary complications seem to be related to the disruption of the normal activity of respiratory muscles, a phenomenon that starts at the induction of anesthesia and continues into the postoperative period. Anesthetics, phrenic nerve dysfunction, and surgical trauma all impair the function of respiratory muscles after surgery. These mechanisms lead to a decrease in functional residual and vital capacity for many days and subsequently leading to atelectasis (Pasquina, et al. 2006).

In an animal study, atelectasis was shown to promote bacterial growth due to reduced function of alveolar macrophages and reduced functional surfactants, explaining the risk of pneumonia (Pasquina, et al. 2006). In a stratified randomised trial of 456 patients who underwent surgery, some patients were considered to be at low risk with respiratory complications. The rate of respiratory complications was 15% (35/231) for patients in the incentive spirometry group and 12% (28/225) for patients in the mixed therapy group (Hall, Tarala, Tapper & Hall, 1996).

A study done in United Kingdom (UK) in 1996 among 26,000 men and women showed the following results: smoking was seen to damage the airway and lung tissue, and such damage does not repair itself. However, quitting smoking stops the ongoing damage caused by tobacco smoke. People who have asthma have more frequent or worse asthma attacks if they smoke (Engeland, Andersen, Haldorsen & Tretli, 2004).

Lower respiratory tract infections (LRTI) cause 17.7% of deaths of children between the ages of 0 and 4 years in developing countries as compared with 6.1% in developed countries (Benatar, 2001). In a study done in Gambia from 1993 to 1996, it was found that respiratory syncytial virus (RSV) is a well-recognised cause of lower respiratory tract infections in early childhood (Webber et al. 1998).

Respiratory syncytial virus is a significant cause of lower respiratory tract infection in young children in Gambia, causing epidemics of bronchiolitis. It poses a significant burden on the health system, especially through the demand for supplementary oxygen and physiotherapy (Webber et al. 1998). A study carried out in a rural district hospital in southern Mozambique

between October 1998, and May 2000, found that RSV is a major cause of LRTI in infants throughout that district, but little is known about RSV infection in Africa where LRTI are among the leading causes of infant and childhood deaths. Respiratory syncytial virus infection was found in 8.6% of outpatient infants and 10.6% of admitted children with LRTI. The cases were presented in predictable yearly outbreaks during the warm and rainy seasons. Lower respiratory tract infection involvement was frequent (59.7%). Cough, chest in-drawing and increased respiratory rate were all independently related to RSV infection. Wheezing was frequent at 4.6% incidence and the case-fatality rate was 3.4% (Loscertales et al. 2002).

It is reported that after pneumoconiosis and associated respiratory conditions, occupational asthma was the second most commonly reported condition, at an incidence rate of 6.9% (Hnizdo, Esternhuizen, Rees, & Lallo, 2001). The average annual incidence for occupational asthma in South Africa is reported to be 13.1% per every one million employed people, with the highest incidence reported from the Western Cape Province at 37.6% per million. Mining-related diseases such as pneumoconiosis, COPD and silica dust-related tuberculosis are still the leading occupational respiratory diseases in South Africa (Hnizdo, et al. 2001). The burden of occupational asthma and the agents causing the respiratory disease are not known. However, the issue is becoming a public health matter in South Africa (Hnizdo et al. 2001).

It also is not surprising that respiratory disorders have been described in patients with the acquired immunodeficiency syndrome, given the impairment of their immune system. Most of such patients have low CD4 (type of white blood cells) count and the structures of their airways are also damaged or obstructed (Barker, 2002). A study was done in the Free State Province of

South Africa, on sputum screening for tuberculosis case detection. Among the 1999 patients aged 15 years and over with cough or difficult breathing, 1000 were placed in intervention clinics, with 999 in control clinics. Some of the patients inhaled corticosteroid prescriptions for obstructive lung disease, and others antibiotic prescriptions for respiratory tract infections; this study revealed that tuberculosis were higher in those with HIV/AIDS (Fairall et al, 2005).

According to a report of the King Faisal Hospital in Rwanda, conditions affecting the cardio-respiratory system such as asthma, emphysema, chronic bronchitis, and respiratory vulnerability acquired after thoracic surgery are commonly treated in physiotherapy. Furthermore, respiratory infections and HIV/AIDS were found in 8.9% of the 15 - 49 year age group, with some among them having lungs obstructive and needing chest physiotherapy (Rwandan Ministry of Health, 2005).

2.4 BURDEN OF RESPIRATORY DISEASE

The burden of disease, injuries and prolonged bedrest in the human population has been measured in Disability Adjusted Life Years (DALYs). Using this approach, it was estimated that respiratory diseases account for 15% of the global burden of diseases in 1999, with COPD contributing to 2.7% of the burden, and asthma 0.9% (WHO, 2001). Overall, the state of respiratory health in the world today compared to 30 years ago reveals that all have not shared in the improvements. Lower respiratory tract infections account for 9.1% of DALYs lost from all diseases in the developing world and 1.5% in developed countries, while tuberculosis accounts for 3.1% in the developing and 0.3% in developed nations (Benatar, 2001). However, there were variations between different regions of the world. It was projected that between 1990 and 2020

the burden of different diseases would change in rank, with COPD rising from twelfth to fifth position.

In sub-Saharan Africa, deaths from chronic respiratory diseases are projected to increase threefold, from 57 000 in 1985 to 145 000 in 2015. If demographical changes are considered, by 2015 COPD mortality would rise to 243 000 cases in sub-Saharan Africa, representing nearly a five-fold increase, which is higher than the predicted changes in the global average (WHO, 2001).

Acute exacerbations are the most common reason for hospital admissions and deaths among COPD patients. In addition, health-related quality of life (HRQL) is reduced in COPD affected individuals compared to the healthy population and it is further impaired by acute and repeated exacerbations. Patients are at risk of exacerbations requiring hospitalisations and early death (Scharplatz, & Steurer 2005).

A chronic obstructive pulmonary disease gradually impairs patients' overall physical ability and the economic impact is great (Guell et al, 2005). Many patients spontaneously breathing in the ICU and wards are unable to cough effectively because of respiratory muscle weakness, pain, or a decreased level of consciousness. They cannot be mobilised sufficiently to eliminate the sequelae of secretion retention due to the severity of injury or illness. Chest physiotherapy is indicated in the area of peripheral lung pathology; during bronchoscopy, secretion removal is limited to the level of the segmental bronchus (Ciesla, 1996).

In Africa, respiratory problems are common and major health problems. Data available from many developing countries now suggest that a high proportion of all childhood mortality is a result of Acute Respiratory Illness (ARI) and acute lower respiratory tract infection (WHO, 2001). Each year there are 52 million deaths in the world, 2.9 million of these deaths, representing 5.6% of the worldwide total, are due to respiratory diseases. Of all deaths with respiratory diseases, 6% are from acute lower respiratory infections, 5% from tuberculosis, and 4% from respiratory problems related to HIV/AIDS (Benatar, 2001).

Major thoracic and upper abdominal surgical procedures are accompanied by transient physiological alterations that encourage mucus retention and airway obstruction. These alterations are intensified by many risk factors likely (presence of wheezing and productive cough etc.) and by placement of artificial airway and mechanical ventilation (Braverman, 2004). Progressive respiratory muscle weakness is a major problem that affects both children and adults. In addition to increasing the risk of mortality, recurrent respiratory infections reduce patients' quality of life and impact on attendance at school or work (Eagle & Chatwin, 2006).

Accumulation of mucus in the airway tree may be caused by an increased volume of mucus produced and also by decreased clearance due to defects in the ciliary clearance apparatus. Hypersecretion of mucus contributes to airway diseases by predisposing patients to respiratory infections, and contributing to airflow obstruction and to patients' discomfort. Furthermore, there is a significant association between chronic production of mucus and an increased risk of mortality (Kim, 1997). According to Somerville and Rona (1993), the primary respiratory condition is the cause of many of respiratory diseases; it is progressive and often leads to severe disability, which can persist for many years. In secondary respiratory conditions, the principal

diagnosis is that the non-respiratory condition is occasionally responsible for the admission of the patients to the hospital, and that these can develop other problems linked to the respiratory system, often from the prolonged bed rest or other illness. The most common risk factors for chronic respiratory disease are tobacco smoking, indoor and outdoor air pollution, allergens, occupational agents and others such as cotton dust, grain dust, cement dust, oil fumes and diseases (Halpin, 2003).

A study investigating the relationship between exposure to indoor air pollution and acute respiratory infections (ARI) in children in developing countries revealed that ARI death globally, accounted for approximately 19% of all deaths before the age of 5 years. The acute lobar pneumonia and bronchiolitis lead to respiratory problems and have long been regarded as an important risk factor for ARI morbidity and mortality (WHO, 2001). Indoor air pollution from biomass, the use of certain types of stoves which is strongly poverty related, has long been regarded as an important risk factor for ARI morbidity and mortality. Such pollution adds to the major burden of the global public health problem (Emmelin & Wall, 2007). Exposure assessment for indoor air pollution in developing countries is recognised as a major obstacle because of high cost and infrastructural limitations to chemical pollution sampling (Emmelin & Wall, 2007).

Many patients with airway intubation and mechanical ventilation have the risk to reduce the normal clearance of airway secretions and increasing more the risk of developing ventilator-associated pneumonia (Ntoumenopoulos, Presneill, McElholum & Cade, 2002). People with limb girdle muscular dystrophy may develop respiratory incapacity and diaphragmatic weakness years after the manifestation of skeletal muscle weakness. Respiratory muscle weakness

adversely affects lung volumes, respiratory compliance, gas exchange and alveolar ventilation. Inspiratory muscle weakness leads to reduction of vital capacity and consequent alveolar hypoventilation. Expiratory muscle weakness results in an ineffective cough and increased susceptibility to respiratory infection, whereas weakness of muscles of the upper airways may cause obstruction leading to hyperpnoea, apnea and hypoventilation (Eagle & Chatwin, 2006).

Since acute lower respiratory infection is the chief cause of death in children, exposure in the form of air pollution has important public health implications. In the case of indoor air pollution in households using biomass fuels, the risks also seem to be fairly strong, presumably because of the high daily concentrations of pollutants found in such settings and the large amount of time young children spend with their mothers doing household cooking (Smith, Same, Romieu & Bruce, 2000).

Climate change may have an impact on health as high temperatures, especially over several days, and elevated air pollution, have resulted in high morbidity and mortality rates in some regions; for example in France in 2003 where thousands of deaths were attributable to the warm weather. Also heavy rainy, weather can affect the vulnerable populations like the very young, the elderly, those with pre-existing respiratory disease such as, asthma, COPD or cardiovascular disease. The impact of winter and summer weather make some people vulnerable to have fever, aches, and respiratory problems, which can be severe (The Lung Association, 2007).

2.5 ROLE OF THE PHYSIOTHERAPIST IN MANAGEMENT OF RESPIRATORY PROBLEMS

The role of the physiotherapist in the area of cardiorespiratory physiotherapy should be viewed in the same light as rehabilitation in the broader context, but specifically to (i) control and alleviate as much as possible the symptoms and pathophysiological complications associated with respiratory impairments, and (ii) to enable the patient to achieve his/her maximum potential to carry out activities of daily living. Other components of the rehabilitation programme should address issues related to nutrition, education about their condition, lifestyle changes, and psychosocially (Irwin & Tecklin, 1985).

Aerobic exercise is effective in improving the capacity and reduces depression of patient. A programme consisting of diet modification, regular exercise, cessation of cigarette smoking, and control of blood pressure will at least stabilise the disease process in some patients and offers the greatest chance of reducing cardiovascular morbidity and mortality (Irwin & Tecklin, 1985).

The WHO (1995) proposes three levels of prevention of disability. Thus, the researcher applies these concepts in the management of individuals with cardiorespiratory dysfunction. Based on this WHO model, three major roles of primary, secondary and tertiary prevention with regard to respiratory diseases can be identified for cardiorespiratory physiotherapists. In primary prevention the aim is to prevent the occurrence of preventable respiratory disorders, usually those related to lifestyle, such as tobacco smoking. In secondary prevention the aim is to prevent complications once the disease manifests itself already. In tertiary prevention the aim is to minimise the activity limitation and participation restriction associated with a chronic respiratory

condition. It is thus within this context that the indications for chest physiotherapy are presented below.

2.5.1 Prophylaxis

This constitutes the primary prevention level in patients at risk of developing respiratory impairments and complications. Limb exercises (passive, active assisted, or active resisted) may be performed in intensive care units (ICUs), even in ward patients with the aim of maintaining or improving joint range of motion, soft-tissue length, muscle strength, and function, and decreasing the risk of failure of breathing (Stiller, 2000).

Dysfunction of the respiratory muscles due to major abdominal surgery or illness may lead to a reduction in vital capacity (VC), tidal volume (TV), and total lung capacity (TLC), and consequently to ineffective cough. This may cause atelectasis in the basal lung segments and decrease in functional residual capacity (FRC), which in turn, will affect the gas exchange properties of the lung by increasing the ventilation/perfusion (V/P) mismatch. It has been hypothesised that respiratory muscle weakness is associated with higher postoperative pulmonary complications, and that preoperative inspiratory muscle training can help to prevent these ventilatory impairments and enhance breathing (Hulzebos et al, 2006).

According to Herbert, Maher, Moseley and Sherrington (2001), chest physiotherapy prevents and manages pulmonary disease before and after surgery, reduces morbidity after major abdominal surgery. It reduces the incidence of pulmonary complications after major abdominal surgery from 27% to 6%. This implies that, on average, one pulmonary complication is prevented for

every five patients treated. Chest physiotherapy is of most benefit to patients at the highest risk of postoperative complications if treatment starts early. There are reports of immediate radiological improvement following physiotherapy intervention (Willis & Prasad, 1999). In a pilot study of 263 patients by Westwood, et al (2007) it was found that incentive spirometry, as part of an intensive post-operative physiotherapy treatment, decreased the occurrence of pulmonary complications (6% vs 17%, $p = 0.01$) and length of stay (3.1 days vs 4 days $p = 0.03$).

Pulmonary complications are important causes of morbidity and fatalities among patients following cardiac surgery. Myocardial revascularisation surgery has now been performed for more than thirty years; nevertheless, pulmonary complications are important causes of increased morbidity and mortality in patients submitted for this procedure. Pulmonary function alterations identified in patients submitted to myocardial revascularisation surgery depend on several factors such as the preoperative pulmonary function, associated co-morbidities (obesity, smoking, sedentarism, age), the type and time of surgery, the indications for, and duration of extracorporeal circulation (ECC), the intensity of the surgical manipulation and the presence of pleural drainage (Romanini, et al, 2007).

Chest physiotherapy is frequently used in the prevention and treatment of postoperative pulmonary complications such as atelectasis, pleural effusion and pneumonia in an attempt to accelerate the process of pulmonary function recovery, as the full recovery occurs within around 15 days (Romanini, et al, 2007).

2.5.2 Acute respiratory conditions

An acute respiratory condition can be an isolated incident which usually resolves with treatment, or it can be an acute episode on an underlying chronic respiratory condition. In both cases immediate or early physiotherapy intervention is indicated in order to prevent deterioration of the underlying chronic condition which can lead to respiratory failure. This is the secondary level of disability prevention in order to optimise long – term prognosis and to enable patients to regain full physical and psychological status (Taylor, Bell & Lough in Pryor & Prasad, 2008). Chest physiotherapy is the choice treatment of the lungs, for both preventing and treating pulmonary complications caused by retained secretions. The beneficial results of chest physiotherapy include improvement in chest wall, arterial blood gases, and lung compliance. It is evident that chest physiotherapy is successful despite the presence of severe trauma and possible contraindications (Ciesla, Klemic, & Imle, 1981).

The potential benefits of chest physiotherapy may outweigh the existing possible contraindications in the case where the patient is very congested (Ciesla, et al. 1981). Chest physiotherapy is justified to patients with respiratory problems starting from diagnosis of the disease (Doring, & Hoiby, 2004). The intention is to remove airway obstructions, reduce airway resistance, enhance gas exchange, reduce the work of breathing and also reduce hospital admission. In the acute situation, recovery should be hastened and in patients with a chronic respiratory disorder, the progression of the lung disease is hopefully delayed (Willis & Prasad, 1999).

The experienced pediatric physiotherapist recognises some respiratory disease situations that do not require chest physiotherapy because mucus cannot be removed from the lower respiratory tract when it is not present or when it does not contribute to the prevailing disease situation and the risk of complication. This pertains to a wide spectrum of pediatric respiratory disorders such as croup, acute bronchiolitis, acute severe asthma, pneumonia with lobar or segmental consolidation and interstitial lung disease (Oberwaldner, 2000).

2.5.3 In chronic respiratory conditions

In these conditions permanent pathophysiological changes have been established in the lungs, including pulmonary vascular changes. Since some respiratory conditions may not benefit from the traditional hands-on physiotherapy, the clinician will still be able to advise patients on exercise (physical activity) in an attempt to improve the patient's well-being (Smith & Ball, 1998). According to Young (1996), in Smith & Ball (1998, p 190) the key objectives of cardiorespiratory rehabilitation of persons with chronic respiratory impairments are, "realisation of potential, re-enablement, resettlement, role fulfilment, readjustment".

The role of physiotherapy should be considered in terms of positioning the patient to optimise ventilation/perfusion, and in the intensive care setting, the physiotherapist is often requested to assist in reinflation of the lungs (Willis & Prasad, 1999). The role of the physiotherapist in the intensive care units (ICUs) and in wards, which admit critically ill patients, has received attention in recent times with the emphasis on multidisciplinary teams. In Australia it has been found that referral decisions were held by physiotherapists in only 27% in ICUs and wards (Chaboyer, Gass & Foster, 2004).

The aim of chest physiotherapy is to promote recognition of the benefits of breathing exercise in the management of a variety of lung conditions, to minimise recurrent infections, to clear the lungs of obstructive and damaging secretions and to delay the onset of bronchiectasis. Physiotherapy may further minimise pulmonary complications, thereby reducing patient morbidity and preventing prolonged hospitalisation (Denehy, et al, 2001). Varela, Ballesteros, Ballesteros, Novoa and Aranda, (2006) reveal that after implementation of an intensive chest physiotherapy programme, the prevalence of respiratory problems, morbidity and hospital stay were estimated in regression. Savings from avoided hospitalisation days were found, prevalence of atelectasis and hospital stay decreased in the group that had chest physiotherapy. The authors found a significant decrease in the rate of postoperative atelectasis without additional costs. In fact, the programme has produced considerable monetary savings for the patients.

Medications represent the mainstay of pulmonary treatment, while other therapies are primarily supportive. These adjunctive therapies include supplemental oxygen and chest physiotherapy. Chest physiotherapy assists in treating some of the symptoms of the respiratory disorders, such as airflow obstruction, alterations in breathing and impaired exercise performance. Increased airway clearance enhances gas exchange and reduces the work of breathing and airway resistance (Yp et. al., 2006). The authors concluded that CPT had beneficial effects in patients with respiratory disorders after using postural drainage, chest percussion, vibration, thoracic oscillation and directed coughing.

As mentioned earlier, physiotherapists' mission is to create awareness among medical staff within a multidisciplinary framework. Specific goals are to avoid hospital admissions where possible and, to permit earlier discharge from hospital to lessen the burden on the emergency department in an integrated approach with patient care. This could help by serving as a bridge between the outpatient clinic and the inpatient wards. This approach promotes systematic patient teaching and better liaison with the treating physicians and nurses (Schwartzman et al., 2001).

Chest physiotherapy after surgery is utilised in an attempt to prevent overt atelectasis and allow for the early re-expansion of collapsed alveoli (Hall, et al, 1996). According to Bradley, Moran and Elborn (2005), physical therapies are part of the care management plan for the patient with respiratory disorders. The type of training programme and the inclusion of both aerobic and anaerobic training may influence the benefits obtained from including CPT in a package of care. With abdominal surgery CPT can decrease the complications and hasten recovery (Westwood, et al. 2007). Chest physiotherapy is best used for patients with copious secretions or respiratory dysfunction who have a reduced ability to cough. In acute and chronic respiratory disorders with retained airway secretions, CPT can enhance airway clearance. This intervention helps to improve and maintain the well being of patients within the limitations imposed by the impaired lung function (Anderson & Jenkins, 1993). Mackenzie and Shin (1985) conducted a study on a population-based sample of 12 men and 9 women, of a mean age of 32.4 years in the USA, to examine the effect of CPT treatment administered for patients receiving mechanical ventilation. All patients had respiratory failure after trauma and various respiratory variables were measured before and up to 2 hours after treatment with no significant changes in arterial blood gas. However, intrapulmonary shunt significantly decreased by a mean of 20% immediately after

CPT (from a mean of 16.4 to 13.2%), and there was a significant increase in total lung compliance of 14% 2 hours after physiotherapy. This revealed that there is a decrease in risk factors of morbidity and socioeconomic implications if treatment is administered for patients early. Another study was conducted on 18 patients with cystic fibrosis hospitalised for a pulmonary exacerbation, to evaluate the short-term lung function and effects of CPT in relation with sputum production. Lung functions were measured before and after CPT, which improved more markedly from 1 to 4 days. This significant lung function improvements was not only maintained, but increased its effect in the reduction of length of stay in hospital (Oberwaldner, Theissl, Rucker & Zach, 1991).

Wang, Olak, Ultmann and Ferguson (1999), conducted a study to assess the utility of maximum oxygen consumption during exercise and diffusing capacity for carbon monoxide in the prediction of postoperative pulmonary complications, and the effect of such complications on postoperative length of hospital stay and the cost of hospitalisation also were assessed. It was found that the pulmonary complications after major lung resections, which are associated with increased length of hospital stay and cost, can be reduced with CPT if applied early. Forty patients had lung resection with no operative mortality. The postoperative length of hospitalisation was longer for the 13 patients who developed pulmonary complications compared with the 27 patients who did not and the cost of hospitalisation in the former group was higher. Diffusion capacity was higher in patients without pulmonary complications than in patients with pulmonary complications (Wang, et al.1999).

Chest physiotherapy can assist with sputum removal and improve ventilation without increasing distress to the patient. Auscultation plus chest x-ray findings help to determine the regions of the lung to be treated (Wang, et al.1999). Physiotherapists can be responsible for large numbers of patients being referred to them, based on the positive outcomes achieved in airway clearance by using different chest physiotherapy methods. It is important to note that both breathing exercises and coughing improve their lung function and increases their quality of life (Pryor, 1999). A study by Feldman, Rossignol, Abenhaim and Gobeille (1996), on referral of patients with low back pain demonstrated that physicians request physical therapy services based on certain patient characteristics. Patients who were referred earlier tended to return to work sooner than those who were referred later, which indicates that timing of physical therapy is an important factor in the rehabilitation of workers with low back pain. Of the cohort, 389 subjects (18%) had received physical therapy after referral by their physicians and treatments have been administered. Implementation of physical therapy within one month of back injury had a strong protective effect on return to work within 60 days.

According to Fillipas, Oldmeadow, Bailey and Herry (2006) the physiotherapist should be aware of respiratory problems, which may develop in the patient, and the preventive measures that might need to be undertaken. Chest physiotherapy is well accepted as therapy in the management of chronic respiratory illness. Among people with HIV, it has been indicated to be both beneficial and safe. It increases cardiovascular fitness, endurance, enhances strength and improves mood.

Chest physiotherapy may be enhanced by the presence of an experienced physiotherapist with knowledge and expertise in HIV management may contribute to improve the wellbeing of patients with respiratory problems. A study done among 43 patients, 20 randomised controlled trials (RCTs) interventions and 20 control group aged more than 18 in Australia showed that their lungs have improved with CPT compared to control group (Fillipas, et al. 2006).

The management of mucous hypersecretion can be undertaken in two main ways: firstly, improved clearance by physical methods (CPT); and, secondly, by pharmacological methods (Kim, 1997). More scientific evidence from randomised controlled trials comparing the efficacy of different techniques in CPT would significantly enhance the clinical decision making process in assessing the best way to treat future patients (Denehy & Berney, 2001).

2.6 CHEST PHYSIOTHERAPY INTERVENTIONS

The most applied interventions in the symptoms in respiratory conditions is the use of chest physiotherapy to increase bronchial mucus transport and reduce retention of mucus in the airways (Van der Schans et al. 1999). Denehy and Berney, (2001) report that effective patient management lies not only in the technology available but also in the clinical decision-making skills of the physiotherapist, thus adopting a problem-solving approach. The physiotherapist should take into account the pathophysiological problems of the patient, the benefits and disadvantages, indications and contra-indications of using the particular technique or equipment, and the availability of resources. It is a matter of clinical judgment together with a sound knowledge of physiology and current research in the area that provides the best outcome for patients when considering which treatment technique is optimal. Interventions used by

physiotherapists in dealing with problems related to respiratory impairments are presented below.

2.6.1 Retained bronchopulmonary secretions

This problem can result from impaired mucocilliary clearance, ineffective cough and respiratory muscle weakness. Chest physiotherapy is the primary physical method to compensate for impaired mucociliary clearance by removing viscid and inflammatory material from the patients with airway obstruction. Individually tailored approaches to CPT are needed for different age-groups and for individual patients (Doring & Hoiby, 2004).

Postoperative CPT was implemented in the beginning of the 20th century; deep breathing exercise was one of the first methods followed by a variety of manual treatments including chest wall percussion, clapping, vibration, or shaking, developed to improve bronchial drainage. More recently, mechanical breathing devices such as incentive spirometry (IS), blow bottles, intermittent positive pressure breathing (IPPB), and continuous positive airway pressure (CPAP) were introduced into clinical practice to enhance all patients with weakness or congested lungs (Pasquina, et al, 2006).

If secretions were drawn into the catheter during suctioning, suction flow would be retained and the lung would not be exposed to negative pressure. In addition, removal of these obstructive secretions from the airways may open up a significant area of the lung to gaseous exchange, thus increasing lung volume and improving compliance during suction. The physiotherapist also

shakes the chest wall to facilitate the shifting the secretions from the lungs (Morrow, Futter & Argent, 2006).

Patients with reduced lung volume and ineffective cough resulting from chest wall deformity, such as kyphoscoliosis, respiratory muscle weakness or prolonged immobility may benefit more from IPPB. Patients with respiratory muscle weakness resulting from spinal cord injury or neuromuscular disorders have a severe restrictive ventilatory defect characterised by a reduction in forced vital capacity (FVC); forced expiratory volume in one second (FEV₁) and peak expiratory flow rate (PEF). Chest physiotherapy could improve breathing in those cases (Denehy, & Berney, 2001). This appears to contribute to loss of lung dispensability, airways obstruct and may lead to the development of life threatening respiratory disorders. Intermittent positive pressure breathing has been reported to improve lung compliance in patients with the above pathologies (Denehy, & Berney, 2001).

Intermittent positive pressure breathing could also help both in the clearance of secretions and in the relief of the work of breathing (Pryor & Webber, 1993). Denehy and Berney (2001) observed that in patients with excessive secretions, IPPB may need to be combined with gravity assisted drainage and chest wall vibrations for more effective upward movement of secretions in the lungs. Incorporating a slow inspiratory flow with IPPB, coupled with chest wall vibrations during expiration may increase peak expiratory flow. Another adjunct to breathing have introduced the term CPAP. The use of CPAP was extended to adults with severe respiratory distress where CPAP was found to be effective in delaying or preventing patients' intubation in intensive care units. The need for intermittent positive-pressure breathing therapy may be

necessary once CPT and incentive spirometry are done. In a study done on patients who had undergone intrathoracic or upper abdominal surgery, there were no differences in outcomes for patients who received and those who did not receive IPPB once both CPT and incentive spirometry were given (Chase, Merz, Shinozaki, Greenwood, & Deane, 1983).

Patients who regularly expectorate, or those who have tenacious sputum may benefit from forced expiratory techniques during CPT (McKenzie, 2006). Physiotherapy techniques aim to remove excessive secretions from the lungs, thereby improving ventilation in the short term. In the long term, reduction of damage brought about by loss of elasticity to the airways might slow the progressive damage and impairment of mucociliary clearance (Willis & Prasad, 1999).

2.6.2 Atelectasis

Atelectasis or pulmonary collapse is caused by an obstructed airway in both the post-surgical and the seriously ill non-surgical patients. It is reported that in episodes of acute atelectasis, CPT has been shown to be effective in reducing the incidence of postoperative and non-operative pulmonary complications through bronchial drainage, manual percussion and vibration of the chest (Hammon & Martin, 1981).

2.6.3 Respiratory muscle weakness

Breathing exercise can often be the treatment of choice as a means of airway clearance or as an adjunct to other techniques. It has been recognised as contributing to enhanced quality of life and improvements in functional exercise tolerance in people with chronic respiratory diseases such as

cystic fibrosis. In addition, breathing exercise has been shown to increase respiratory muscle endurance, increase sputum expectoration and preserve respiratory function in some individuals with CF. Deep breathing exercise may have a role in aiding sputum expectoration in patients with CF but should not be considered as a replacement for physiotherapy (Morrison & Agnew, 2007).

Each method hopes to achieve improved clearance for less effort and improve compliance (Willis & Prasad, 1999). Inspiratory muscles are strengthened during breathing exercises, or CPT may increase their exercise capacity, thus improving the quality of life and a decrease in dyspnea. This reduces the problem of respiratory disorders (Berckman et al., 2005).

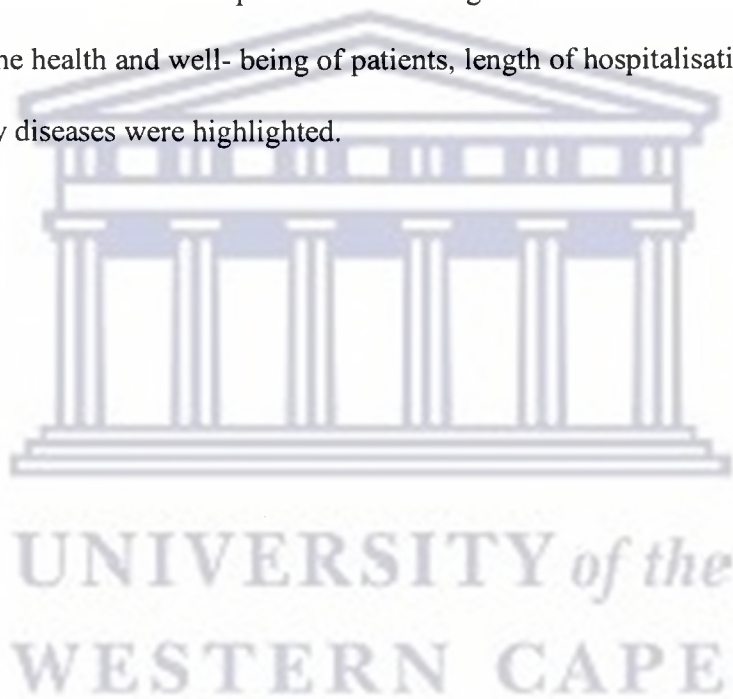
2.6.4 Patients at risk

Chest physiotherapy for patients after open abdominal surgery is intended to improve cardiovascular and physical function to reduce the incidence of postoperative pulmonary complications. This intervention may include lung expansion exercises, secretions clearance techniques, limb exercises and progressive mobilisation. A study done with 50 participants divided into two groups using deep breathing exercises and coughing for each group, supervised by physiotherapists showed an improvement of 17% and the unsupervised 14%. There was not a highly significant difference (Mackay, Ellis & Johnston, 2005).

2.7 SUMMARY

In this chapter a review of literature pertinent to this study has been presented. The main points explored include, pathophysiology of respiratory dysfunction, morbidity and mortality from respiratory diseases, burden of respiratory disease, role of the physiotherapist in management of respiratory problems and chest physiotherapy interventions.

Furthermore, the literature review has provided the background information for the study. The benefits of CPT on the health and well-being of patients, length of hospitalisation and the cost of managing respiratory diseases were highlighted.



CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter describes the method used for the study, the research setting, study design, the study sample, and procedures relating to validity of the research instruments, information gathering and data analysis. The ethical aspects considered in carrying out the study are also explained.

3.2 RESEARCH SETTING

The study was carried out at the University Teaching Hospital of Butare (UTH) in Huye district, in the southern province of Rwanda. It is one of the national teaching and referral hospitals, which receives patients for treatment mainly from the southern province of the country. The hospital offers both inpatient and outpatient physiotherapy services. For the purposes of the study the selection of this hospital was based on the fact that it is a major referral hospital serving patients across the different areas of specialisation in medicine. There are four major departments, namely internal medicine, surgery that includes orthopaedics, neurosurgery, urology, general surgery and burns. The other two departments are paediatrics, and gynaecology and obstetrics. The study was conducted in the four mentioned departments and in the physiotherapy department.

3. 3 STUDY DESIGN

The study design consisted of two parts. The first part was a cross-sectional study using a quantitative research method to determine medical physicians' referral trends of patients for chest physiotherapy at UTH of Butare. The researcher used a questionnaire with close-ended questions, developed from the relevant literature (Greene, Smith, Allareddy & Haas, 2006; Descramer, et al, 2003). For the second part of the study, patients' hospital and physiotherapy records were analysed by means of a retrospective descriptive research method.

In quantitative studies, the researcher looks at the relationship between two or more variables, or differences between two or more groups (Hek, Judd & Moule, 2003). The retrospective design was considered appropriate as the researcher analyzed hospital records of patients treated at the UTH of Butare during a selected period. According to Bless and Higson-Smith (2000) the use of records is a non-reactive research method using unobtrusive measures whereby information about the subjects is gathered without direct interaction. The retrospective study has the following disadvantages: the important data may not be available during the period of collecting data, and it is difficult to control bias and confounders. There is no randomization, no blinding, and it may be impossible to access important information needed. It may be restricted by statutes or institutional regulations. A retrospective design is usually discouraged when a prospective study is feasible. Retrospective study designs are generally considered inferior to prospective study designs (Hess, 2004). The results of the survey among physicians could be influenced by recall bias which could impact on the interpretation of the results.

In spite of the potential disadvantages of a retrospective study design, the researcher pursued the latter, given the availability of hospital records accumulated over full 1- year period

and the time and cost limitations to the researcher if a prospective study design was chosen.

3.4 POPULATION AND SAMPLE

The study used three sets of research populations, namely the physicians employed at the UTH of Butare during 2006, the patients who attended the hospital during the year 2006 and all patients who received physiotherapy services for respiratory problems during 2006. Using convenient sampling, all physicians from the selected departments who were employed at the UTH in 2006 were invited to participate in the study. According to the Annual Hospital Report of 2006, the UTH of Butare had 36 physicians from the four departments.

According to information obtained from the chief nurse of the UTH via email (gafirinaason@yahoo.fr on 29/04/2007), 7160 in-patients were seen at the UTH during 2006. Thus, for the second part of the study the researcher selected ten percent (10%) of the 2006 patients' hospital records (n=716). According to De Vos (2005), when the population is large, a smaller percentage of that population may be selected for use. The same author further states that in most cases between 10% and 30% sample size of a large population should be sufficient for controlling sampling errors and is sufficient to perform a basic statistical analysis. The researcher used systematic random sampling whereby every 10th patient's record was selected until the required number of records had been extracted (Babbie & Mouton, 2006). In case the 10th record did not fulfil the inclusion criteria for the study, the next record was selected. For the third part all patients who received physiotherapy services for respiratory problems during 2006 were identified from the physiotherapy register.

3.4.1 Inclusion criteria

Only those physicians who had worked at the UTH during 2006 in internal medicine, surgery, paediatrics, and gynaecology and obstetrics at the UTH of Butare participated in the study. Only complete records containing written information on medical diagnosis, patients' progress, and management or treatment during the period of hospitalisation were selected. Other inclusion criteria were legible handwriting and clear dates of admission and discharge. All patients with respiratory problems who were treated in physiotherapy department during that period.

3.4.2 Exclusion criteria

Patients' files with illegible writing and incomplete records were excluded from the study. All physicians who worked in internal medicine, surgery, paediatrics, and gynaecology and obstetrics after 2006 were excluded. Physicians who work in departments such as laboratories and radiography departments were not included in the study.

3.5 STUDY INSTRUMENTS

Two study instruments were developed; one to be used by the participating physicians and the other to capture data from the patients' medical records and from the physiotherapy department's register.

A self administered questionnaire based on literature (Descramer, et al. 2003) was developed by the researcher. The user-friendliness, reliability and validity of the physicians' questionnaire were piloted prior to its use. The questionnaire consisted of close-ended questions, which were used to collect the physicians' demographical data, patient referral attitudes based on the benefits

and experience with chest physiotherapy. The advantage of close-ended questions is that they offer anonymity and minimize researcher bias (De Vos & Delpont, 2002). A data gathering sheet was used to collect information from the general hospital files, such as patient demographic details, medical diagnoses, date of admission, date of discharge, period of stay, and whether the patient was referred for chest physiotherapy or not. A separate data-gathering sheet was used to determine the number of respiratory patients treated by the physiotherapists in the same period (2006).

3.6 TRANSLATION

The questionnaire(Appendix J & K) and data gathering sheets(Appendix F & G, H & I) were originally developed in English and then translated into French by the author since the patient information in the hospital files was recorded in French. A professional translator was tasked to translate the French version of the questionnaire and data gathering sheets back to English to ensure that its content and meaning corresponded to that in the original questionnaire. Thereafter, a second version which was similar to the original English questionnaire and data gathering sheets was developed. By doing this, validity of the instrument was confirmed.

3.7 VALIDITY

In order to ensure face and content validity of the data gathering sheets, a senior physiotherapist in the area of the study was consulted throughout the construction process of the data gathering sheets. This was to ensure that the researcher gathered and used valid and relevant information (Babbie & Mouton, 2006). Thereafter, other physiotherapists in the department were also invited

to discuss and suggest the possible changes that would ensure clarity and understanding of information in the data gathering sheets. The self-administered questionnaire was developed from literature theories related to patient referral by physicians (Greene et al., 2006; Descramer et al., 2003). The researcher consulted physiotherapists at the UTH of Butare to comment on the physicians' questionnaire and make some necessary corrections and vice-versa. The 7th and 8th questions whose responses were a multiple choice, 1) No and 2) Yes were reversed to 1) "Yes" and 2) "No" (starting with "Yes" instead of "No" seemed to look more convenient)

3.8 RELIABILITY

During the pilot study the researcher and two trained research assistants gathered data from 10-15 patient files and compared the information to ensure inter-tester-reliability. Thereafter, the procedure was repeated three days later with the same set of patient files to recheck the consistency in the data gathering. This was to check on the possible accidental omission of data, or inconsistency among the researcher and research assistants (Huysamen, 2001; Babbie & Mouton, 2006).

3.9 PILOT STUDY

The piloting of the questionnaire was carried out among five physicians who were not included in the main study. The aim was to identify how well the five physicians understood the research questions and how long it would take them to complete the questionnaire. Their answers and comments showed that questions were clear enough; therefore, it was not necessary to make any changes to the questionnaire after this pilot study. Regarding the time spent to complete the

questionnaire, respondents answered questions on average in one hour, which was considered quite reasonable and expected.

Furthermore, in order to ensure face and content validity of the data gathering sheet, the researcher conducted a pilot study on 10 – 15 files to determine whether sufficient information could be obtained from the patients' files and whether any changes would be made.

There were 700 patients' medical folders and the data gathering took 30 days to peruse through patient medical folders in the selected sample. It took two days to collect data from the patient register in the physiotherapy department and three weeks for the physicians to complete and to collect the questionnaire. In the first week, questionnaires and consent forms were handed to the physicians and verbal explanations were given on how to complete them. In the second week, the researcher collected questionnaires from the different departments. However, since some of the hospital staff was not available at the time of collecting the previously distributed questionnaires, this led the researcher to seek new appointments for later collection of questionnaires. Collecting questionnaires took two weeks.



3.10 DATA CAPTURING

Nominal data was entered in a spreadsheet using the statistical software package, SPSS (statistical package for social sciences) version 15.0.

3.11 PROCEDURE

The researcher trained two research assistants in data gathering from the hospital records over a period of two weeks. Permission was obtained to conduct the study as described in the ethical considerations section of this work (section 3.13). Data was recorded from three sources, namely (i) doctors' notes in selected hospital records of patients, (ii) patient register in the physiotherapy department and (iii) the physicians. Only respiratory signs recorded by the doctors eg. breathsounds, cough and breathing patterns etc. at least once in the patients' notes were captured in the data gathering sheets. Three weeks were allocated for the distribution, completion and collection of the physicians' questionnaires.

3.12 DATA ANALYSIS

Descriptive data analysis was used to calculate the frequencies and percentages with the use of SPSS. The data were numerically coded and captured into Microsoft Excel and analysed using SPSS software for descriptive and inferential statistical analysis. The results were expressed as frequencies, means and percentages, with the aid of tables and graphs. The Chi-squared statistical test was employed to identify associations between selected variables from hospital records and physicians and how these were related to patient referral for chest physiotherapy.

3.13 ETHICAL CONSIDERATIONS

The researcher obtained ethical clearance for the study from the Senate Research and Study Grant Committee of the University of the Western Cape (Appendix A). Ethical clearance was also obtained from the Ethical Committee of the Ministry of Health of the Republic of Rwanda (Appendix C). Permission to carry out the study in the institution was requested from the

Director of the UTH, Butare (Appendix E). Anonymity and confidentiality of all information was guaranteed, since no names were used in the data gathering sheets. An information sheet consent form, stating anonymity and confidentiality was given to all physicians who were approached to participate in the study. Finally, consent forms (Appendix L) were distributed to doctors after the purpose of the study was explained to them from information sheet (Appendix N). After participants were assured of respect, confidentiality, and anonymity, they signed the consent forms, which were then collected by the researcher. Participation in the study was voluntary, and respondents were informed that they were free to withdraw from the study at any time. In addition to the University of the Western Cape, the results will also be made available to the University Teaching Hospital of Butare in Rwanda.

3.14 SUMMARY

In chapter three the research method used in the present study have been described. The first part of the study involved a retrospective study analysing patients' record over one-year period. A cross-sectional study design was used, in which a self-administered questionnaire was distributed to the physicians who participated in the second part of the study. The research settings, selection of subjects, inclusion and exclusion criteria have been described. The advantages and disadvantages of using a retrospective study were given. A description of pilot studies and procedure for collection and analysis of data have been outlined. The chapter ends with an explanation of the ethical considerations applied in the study.

CHAPTER FOUR

RESULTS

4.1 INTRODUCTION

This chapter describes the results of the study, using univariate and multivariate descriptive analyses. The description and interpretation of the results obtained from three sets of data will be presented in the following order: Firstly, the medical records of a sample of 700 patients seen at the hospital during the year 2006. Secondly, the physiotherapy records identifying the number of patients that received CPT, and finally, the results from survey conducted among physicians who worked at the UTH in 2006 and participated in the study.

From the samples used the researcher identified patients who had respiratory signs during their period of hospitalisation, patients who had been referred for chest physiotherapy and those who received chest physiotherapy. Tables and figures are used where appropriate and the main trends in the data are presented. The first two steps were to examine hospital and physiotherapy records concerning referral of patients for CPT and whether more patients could have been referred for chest physiotherapy at the UTH of Butare. Thereafter the trends in patient referral for CPT by physicians, their perceived level of knowledge of, and experience with CPT were identified. The Chi-square statistical test and Fisher's exact test were also used to further explore associations

between selected independent variables and patient referral for CPT, the latter being the dependent variable.

4.2 DEMOGRAPHIC PROFILE OF PATIENTS AND PARTICIPATING PHYSICIANS

More females (58.9%) than males (41.1%) were identified from the sample taken from the hospital medical records. The majority of patients were above the age of 18 years. Equal numbers of records (n=175) were selected from each of the main departments at the UTH of Butare.

According to the physiotherapy department records, slightly more males than females received CPT. Equal numbers of patients in the two age groups received CPT (Table 4.1).

Table 4.1 Demographic profile of patients in samples

Variables	Characteristics	Hospital medical		Physiotherapy department	
		records N = 700	(%)	records N = 56	(%)
Gender	Male	288	(41.1)	29	(51.8)
	Female	412	(58.9)	27	(48.2)
Age group	0 to 17	251	(35.9)	28	(50.0)
	18 and above	449	(64.1)	28	(50.0)
	Surgery	175	(25)	8	(14.3)
Departments	Pediatrics	175	(25)	27	(48.2)
	Internal medicine	175	(25)	21	(37.5)
	Gynecology and Obstetrics	175	(25)	0	(0)

All the participating physicians (n=20) were males, with most of them in the 35 – 54 year age group. However, 40% did not state their age. The majority of physicians (55%) practised for

between 0 to 10 years, with most of them (30%) having been practising between 6 – 10 years (Table 4.2).

Table 4.2 Physicians' bio-demographic characteristics

Variables	Characteristics	Physicians	
		N =	20 (%)
Age group	25 to 34	3	(15)
	35 to 44	4	(20)
	45 to 54	4	(20)
	55 and more	1	(5)
	Age not stated	8	(40)
Departments	Surgery	5	(25)
	Pediatrics	4	(20)
	Internal medicine	7	(35)
	Gynecology and Obstetrics	4	(20)
Years of practice	0 to 5	5	(25)
	6 to 10	6	(30)
	11 to 15	3	(15)
	16 to 20	4	(20)
	More than 20	2	(10)



4. 3 PATIENT REFERRAL FOR CHEST PHYSIOTHERAPY

4.3.1 Referral Trends identified from Hospital Records

The analyses of patients identified with respiratory signs are presented below.

4.3.1.1 Prevalence of respiratory signs

Figure 4. 1 shows that 44.6% (312) of the patients in the hospital sample had respiratory signs such as cough, abnormal breath sounds and abnormal breathing patterns.

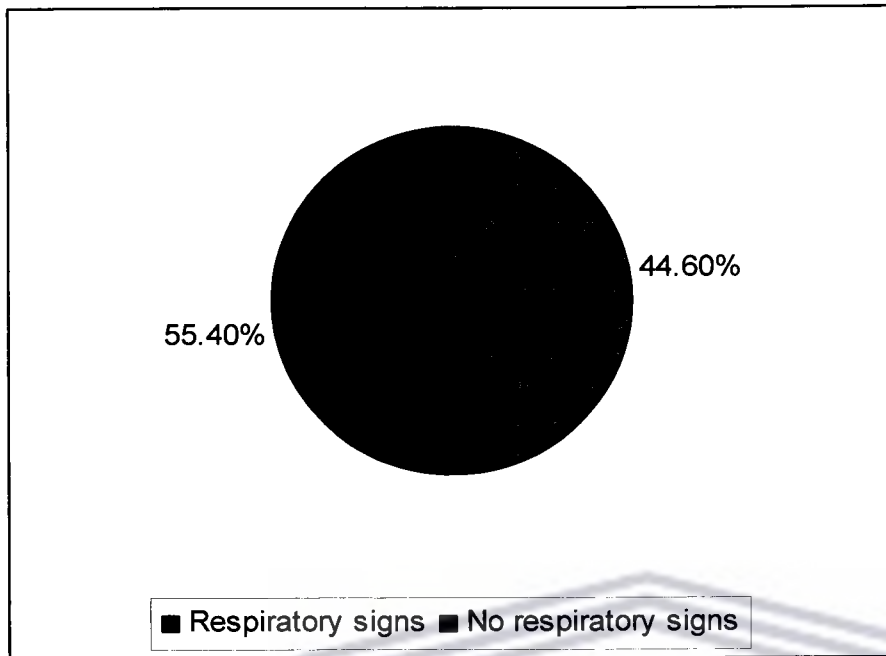


Figure 4.1 Percentage prevalence of respiratory signs in the sample (N= 700)

4.3.1.2 Referral identified from hospital records (N=700)

The hospital records showed that only 8.3% (n=58) of the patients with respiratory signs were referred for CPT. Almost half of the patients who were referred were from the department of pediatrics and internal medicine follows with 3% (n=21). The department of gynecology and obstetrics referred no patients for CPT.

Table 4.3 Referrals identified from hospital records

Referral from departments	Frequency	%
Not referred/ CPT not required	642	91.7
Surgery	10	1.4
Pediatrics	27	3.9
Internal medicine	21	3.0
Total	700	100

N=700

4.3.1.3 Department and respiratory signs

The results show that respiratory signs were more prevalent in the pediatrics department than all other departments, followed by internal medicine. The presence of respiratory signs per department shows a high significant association ($p=0.000$) between respiratory signs and department (Table 4.4).

Table 4.4 Department and Respiratory signs

Departments	Respiratory signs		Total
	Yes	No	
Surgery	66 (37.7%)	109 (62.3%)	175 (100.0%)
Pediatrics	145 (82.9%)	30 (17.1%)	175 (100.0%)
Internal medicine	82 (46.5%)	93 (53.1%)	175 (100.0%)
Gynecology and obstetrics	19 (10.9%)	156 (89.1%)	175 (100.0%)
Total	312 (44.6%)	388 (55.4%)	700 (100.0%)
p- value=0.000 p<0.05			$\chi^2=188.045$, df=3, N=700

4.3.1.4 Respiratory signs and referral status

There was a highly significant association ($p=0.000$) between respiratory signs and referral status. Of the total number of patients with respiratory signs (312) it was shown that 81.4% were not referred for CPT despite the presence of respiratory signs (Table 4.5).

Table 4.5 Respiratory signs and referral status

Respiratory signs	Referral status		Total
	Referred	Not referred	
Yes	58(18.6%)	254(81.4%)	312(100.0%)
No	0(0%)	388(100.0%)	388(100.0%)
Total	58(8.3%)	642(91.7%)	700(100.0%)

p- value=0.000 p<0.05 $\chi^2=78.644$, df=1, N=700

4.3.1.5 Department and referral

The Pearson's Chi-square test showed highly significant associations ($p=0.000$) between departments and patient referral for CPT. Thus, certain departments such as pediatrics and internal medicine were more likely to refer patients for CPT (Table 4.6).

Table 4.6 Department and referral

Department	Referral			Not referred/ not required	Total
	Surgery	Pediatrics	Internal medicine		
Surgery	10 (5.7%)	0 (.0%)	0 (.0%)	165 (94.3%)	175 (100.0%)
Pediatric	0 (.0%)	27(15.4%)	0 (.0%)	148 (84.6%)	175 (100.0%)
Internal medicine	0 (.0%)	0 (.0%)	21 (12.0%)	154 (88.0%)	175 (100.0%)
Gynecology and obstetrics	0 (.0%)	0 (.0%)	0 (.0%)	175 (100.0%)	175 (100.0%)
Total	10 (1.4%)	27 (3.9%)	21 (3.0%)	642 (91.7%)	700 (100.0%)

p- value=0.000 p<0.05 $\chi^2=176.673$, df = 9, N=700

4.3.1.6 Department and referral of patients with respiratory signs

There was no association between departments and referral status of the 312 patients identified with respiratory signs (p - value=0.057).

Table 4.7 Department and referral of patients with respiratory signs

Departments	Referral status		
	Referred	Not referred	Total
Surgery	10 (15.2%)	56 (84.8%)	66 (100.0%)
Pediatric	27 (18.6%)	118 (81.4%)	145 (100.0%)
Internal medicine	21 (25.6%)	61 (74.4%)	82 (100.0%)
Gynecology and obstetrics	0 (.0%)	19 (100.0%)	19 (100.0%)
Total	58 (18.6%)	254 (81.4%)	312 (100.0%)

p- value= 0.057 p>0.05 $\chi^2=7.524$, df=3, n=312

4.3.1.7 The utilisation of CPT at the hospital

Although 8.3% of the sample was referred for CPT, according to the hospital records only 6.7% of patients in the study period (2006) received CPT. Table 4.8 shows that the number of patients who did not attend CPT was 1.6%. The average patient referral for CPT was 5 patients per month (58patients /12mounth).

Table 4.8 Utilisation of CPT

The utilisation of CPT	Frequency	%
Not attended	11	1.6
Received	47	6.7
Not referred / not required	642	91.7

N=700

4.3.1.8 Period of hospitalisation

Figure 4.2 shows that most of the patients 59.1 % (n=414) spent short periods of time in hospital. The rest were hospitalised for more than 11 days.

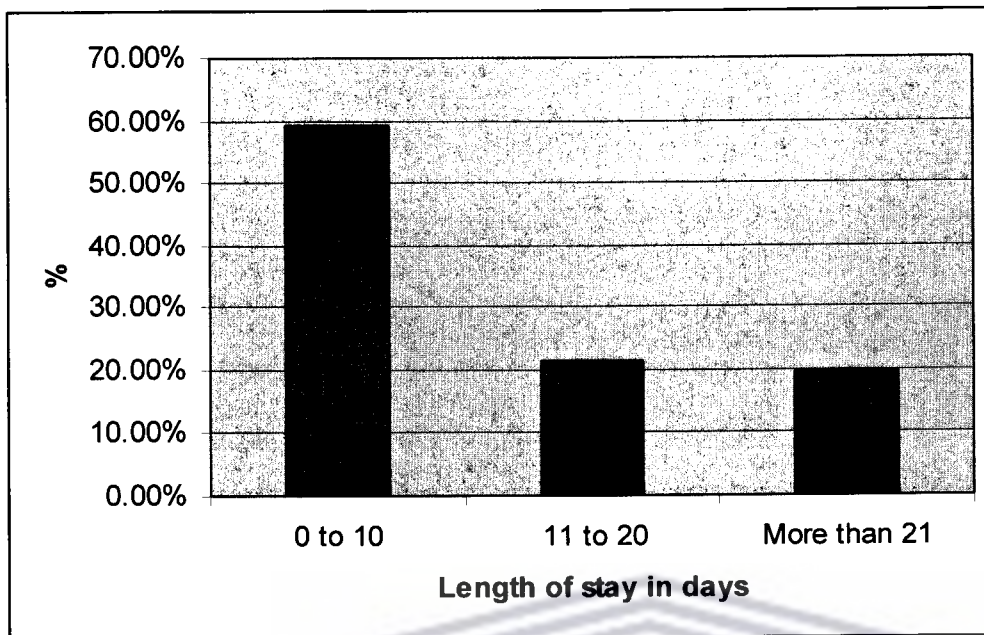


Figure 4.2 The period of hospitalisation in days (N=700)

4.3.1.9 Period of hospitalisation and presence of respiratory signs

There was a highly significant association ($p=0.000$) between period of hospitalisation and the presence of respiratory signs. Among the group of patients with positive respiratory signs, the majority was in short hospital stay followed by patients in long hospital stay (Table 4.9). Most of the patients within the long hospital stay group had positive respiratory signs. Also, this group presents as the second largest group of patients with positive respiratory signs when compared with short and moderate stay groups. This shows that patients in “long” stay may potentially be in need of CPT.

Table 4.9 Period of hospitalisation and presence of respiratory signs

Period of hospitalisation in days	Presence of respiratory signs		Total
	Positive respiratory signs	Negative respiratory signs	
0 to 10 (short)	164 (39.6%)	250 (60.4%)	414 (100.0%)
11 to 20 (moderate)	56 (37.6%)	93 (62.4%)	149 (100.0%)
21 to more (long)	92 (67.2%)	45 (32.8%)	137 (100.0%)
Total	312 (44.6%)	388 (55.4%)	700 (100.0%)

p- value= 0.000 p<0.05 $\chi^2=35.342$, df=2, N=700

4.3.1.10 Period of hospitalisation and referral

There was no association ($p=0.142$) between period of hospitalisation and patient referral. The results showed that the majority of patients, who were hospitalized for either short moderate or long term period, were not referred or did not require chest physiotherapy. Most patients who were referred were found in the short and long term hospitalisation periods (Table 4.10).

Table 4.10 Period of hospitalisation and referral

Period of hospitalisation in days	Referral status		Total
	Referred	Not referred	
0 to 10 (short)	31 (7.5%)	383 (92.5%)	414 (100.0%)
11 to 20 (moderate)	10 (6.7%)	139 (93.3%)	149 (100.0%)
21 to more (long)	17 (12.4%)	120 (87.6%)	137 (100.0%)
Total	58 (8.3%)	642 (91.7%)	700 (100.0%)

p- value=0.142 p>0.05 $\chi^2=3.897$, df=2, N=700

4.3.2 Trends from Physiotherapy Department Records

The analyses of patients who attended the physiotherapy Department for CPT are presented below.

4.3.2.1 Patients who received CPT (n= 56)

These include the 47 patients referred from the hospital's in-patient department and 9 from out-patients. Figure 4.3 shows that most patients who received CPT were from pediatrics (48 %) followed by internal medicine. This seems to compare well with the referrals identified from the hospital records (Table 4.5).

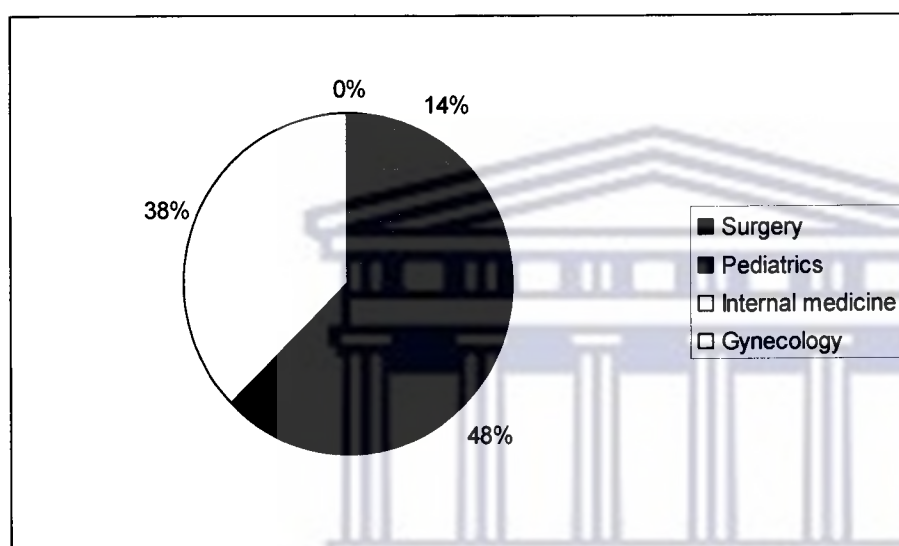


Figure 4.3 Source of the patients referral for CPT (N=56)

4.3.3 Patient Referral Trends identified from Physicians' survey

The analyses of the referral trends identified from the 20 physicians who participated in the study are presented below.

4.3.3.1 Patient referral trends for chest physiotherapy

Table 4.11 shows the frequency of patient referral for CPT ranged between "often" (25%) and "seldom" (70%); very few physicians "never referred" patients for CPT. This was identified by

the observation that the majority of the physicians (75%) referred between 1-5 patients per week for CPT.

Most of the physicians (75%) would not allow nurses to refer patients for CPT. The majority of physicians (25%) referred patients when the latter's medical condition is seriously compromised; similarly with chronic respiratory condition. Among those physicians who worked at the UTH during 2006 the majority (70%) referred patients for CPT.

Table 4.11 Patient referral trends for CPT by physicians

Variables	Characteristics	Frequency	%
Frequency of referral	Never	1	5
	Seldom	14	70
	Often	5	25
Rate of referral per week	None	4	20
	Very few (1 to 5)	15	75
Stage of patient referral	Prelim diagnosis	3	15
	Depend X ray	3	15
	Prophylactically	2	10
	Seriously compromised	5	25
	Chronic respiratory condition	5	25
	Other	1	3.3
Refer patients in 2006 at UTH	Yes I referred	14	70
	No I didn't refer	6	30
Allow nurse to refer patient for CPT	Yes	5	25
	No	15	75

n = 20

4.3.3.2 Physicians' perception of their knowledge of CPT

Table 4.12 shows that 65% of the physicians are of the opinion that they are sufficiently informed on CPT and 95% of the physicians need to know more about CPT. One participant did not respond on this item of information about chest physiotherapy.

Table 4.12 Physicians' perception of knowledge of CPT

Variables	Response	Frequency	%
Has sufficient information about chest physiotherapy	Yes	13	65
	No	6	30
Need to know more about CPT	Yes	19	95
	No	1	5

4.3.3.3 Factors associated with patient referrals

The researcher explored factors which could have had an influence on patient referrals for CPT by physicians at the UTH. Factors considered in the study were: (i) physicians' perception of their knowledge of CPT; (ii) physicians' need to know more about CPT; (iii) stage of respiratory problems; (iv) physicians' experience with benefits of CPT; (v) communication with physiotherapists. The Fisher exact statistical test was used because of the small sample size (n=20)

4.3.3.3.1 Perception of knowledge of CPT and referral

Table 4.13 shows that no statistically significant difference in patient referral between physicians who perceived themselves as having sufficient knowledge about CPT and those who feel they have insufficient knowledge was found (p- value=0.111).

Table 4.13 Perception of knowledge of CPT and referral (Missing:1)

Perception of Patients referral knowledge of CPT	Patients referral		Total
	Yes	No	
Sufficient knowledge	5 (38.5%)	8 (61.5%)	13 (100.0%)
Insufficient knowledge	0 (0.0%)	6 (100.0%)	6 (100.0%)
Total	5 (23.3%)	14 (73.7%)	19 (100.0%)
Fisher's exact test (p= 0.111)		n= 19	

4.3.3.3.2 Need to know about CPT and referral

There was no significant difference in the frequency of patient referral between physicians who wished to know more about CPT and those who stated they did not need more information (p-value=0.750)(Table 4.14).

Table 4.14 Need to know about CPT and referral

Need to know more about CPT	Frequency of patient referral		
	Often	Not often	Total
Yes	5 (26.3%)	14 (73.7%)	19 (100.0%)
No	0 (.0%)	1 (.0%)	1 (100.0%)
Total	5 (25.0%)	15 (75.0%)	20 (100.0%)
Fisher's exact test (p= 0.750)		N=20	

4.3.3.3.3 Need to know more about CPT and stage to refer patient

Similarly, according to Table 4.15, the physicians' need or no need to know more about CPT did not influence the timing of patient referral with reference to stage of illness, namely early or later stage (p-value=0.579).

Table 4.15 Need to know more about CPT and stage to refer patient

Need to know more about CPT	Stage of referral		Total
	Early stage	Later stage	
Yes	8 (44.4%)	10 (55.6%)	18 (100.0%)
No	0 (.0%)	1 (100.0%)	1 (100.0%)
Total	8 (42.1%)	11 (57.9%)	19 (100.0%)

Fisher's exact test (p=0.579) n=19

4.3.3.4 Physicians' experience with CPT

In order to determine the physicians' experience relating to the benefits of CPT, further analysis found that the tendency among physicians was as follows:

Table 4.16 shows that most of the physicians (75%) rated CPT as being efficient. Few physicians (25%) communicated with physiotherapists (Table 4. 16). It is also noted that nearly half of the respondents (45%) seldom communicated, with 30% not communicating.

Table 4.16 Physicians' experience with CPT

Variables	Response	Frequency	%	
Chest beneficial	physiotherapy	Only in certain cases	2	10
		Sometimes	14	70
		Always	3	15
Rate physiotherapy service		Poor	4	20
		Efficient	15	75
		Highly efficient	0	0
Communicate physiotherapists	with	Yes	5	25
		Seldom	9	45
		No	6	30

4.4 UTILISATION OF CPT

4.4.1 Categories of medical conditions (N= 700)

Hospital records show the different categories of conditions encountered in the hospital as a whole. The categories indicated as “Other” included neurological and developmental conditions, and infections such as malaria (Table 4.19). Some of the patients had primary medical problems which normally do not require CPT but who may have an added respiratory problems which required CPT. It was thus not unusual to find patients with gastro – intestinal problems, anemia, lower back pain etc. to be referred for CPT (Table 4.19).

Table 4.19 Categories of medical conditions

Diagnosis	Frequency	%	Referred
Abdominal surgery	12	1.7	0
Orthopedic	114	16.3	6
Burns	18	2.6	3
Respiratory	85	12.1	13
Gynecology and obstetrics	91	13.0	0
Other	380	54.4	36
Total	700	100	58

N=700

4.4.2 Referral and potential for CPT

Figure 4.4 shows that of the 312 patients who had positive respiratory signs (18.6%) were referred for CPT.

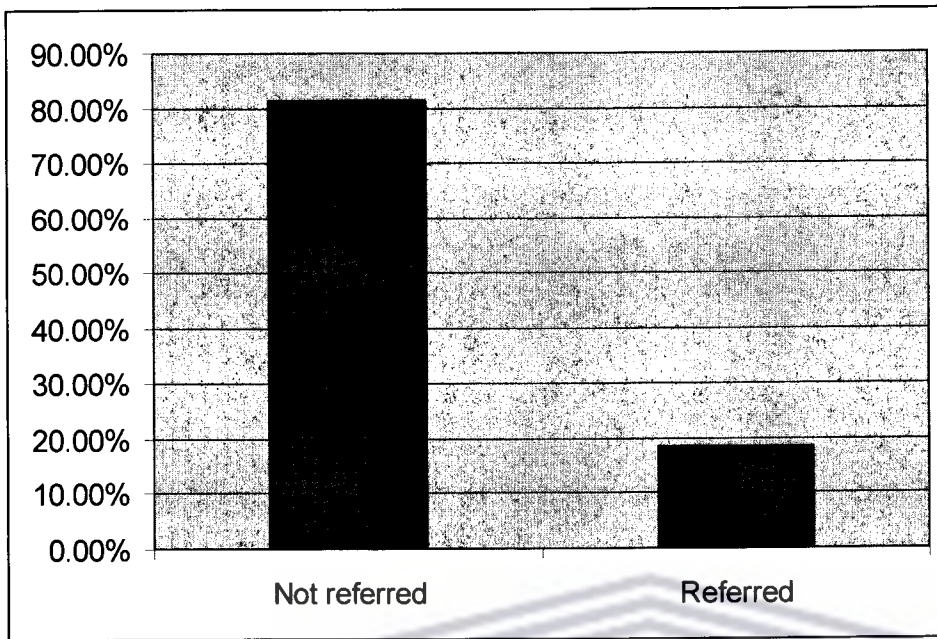


Figure 4.4 Referral and potential for CPT (n=312)

4. 4.3 Monthly new patient users of CPT

Of the 56 patients who attended CPT, 47 patients were referred from the in-patient departments and 9 patients were from the hospital's out-patient section. Figure 4.5 shows that patients were treated every month during the whole year (2006). The number of patients receiving CPT ranged from 1 to 8 per month, with the highest referral rate in June and October. The reason could possibly be related to the climate change in June which is the onset of summer, and October which is the onset of a rainy season.

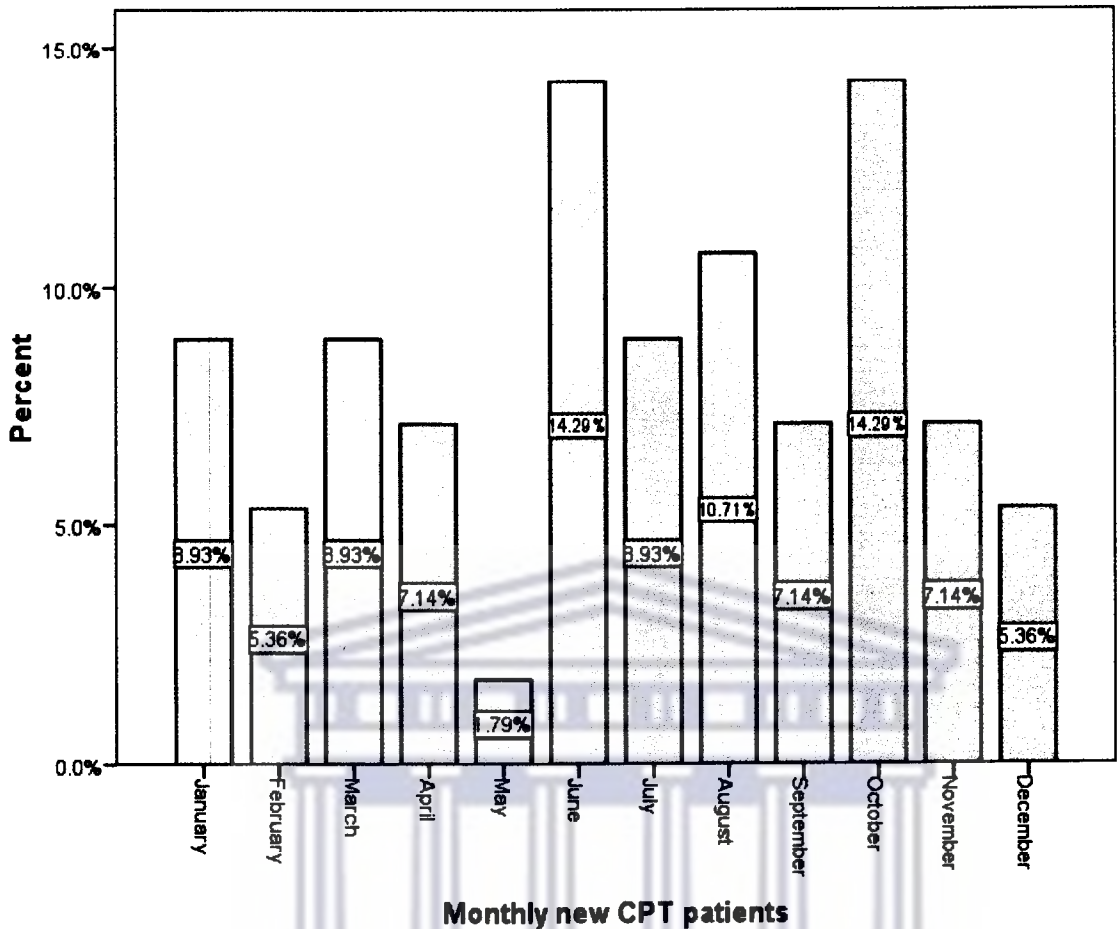


Figure 4.5 Monthly new patient users of CPT

Average new patients for CPT= 5 per month



4.5 THE RESULTS OF METHODOLOGY

4.5.1 Reliability

During the data capturing re-check, in the pilot phase of the study one of the research assistants realised that for a patient (file number 7196), there were discrepancies in length of stay in hospital. The researcher and one research assistant indicated four days, while the other one research assistant mentioned three days from the same file. After the file was revisited, all

members of the team agreed that the length of stay was four days. In other words, this double check confirms four days to be the correct one. File number 6849 was also revisited; one research assistant found 24 days of stay in the hospital whilst the researcher and one research assistant found 25 days. Since the team members did not find similar results, the period of stay in the hospital was again disputed. After this exercise, the team clarified the correct period of stay in the hospital as 25 days. This was done during pilot study of 15 files.

4.6.2 Verification of the sample of physicians

Prior to this study there were 36 physicians according to information supplied by the hospital. However, during the period of gathering data there were 40 physicians among the four departments because new physicians had been recruited. Among the 40 physicians, three were on leave, five participated in pilot study and 20 participated in the main study. Since 12 of the physicians were not employed at the UTH in 2006 they were excluded from the study.

4.7 SUMMARY

This chapter has highlighted the findings of the study. Statistically significant associations were found between the selected variables in medical records and patient referral for CPT. On the contrary, no significant associations were found between possible factors that could have influenced patients referrals by physicians. However, trends in patient referrals by the physicians at the UTH were identified. Of specific relevance to physiotherapists are (i) the physicians' need for more information about CPT, (ii) inadequate communication between the physicians and

physiotherapists, (iii) only few of the physicians found CPT beneficial. The results are discussed in the following chapter.



CHAPTER FIVE

DISCUSSION

5.1 INTRODUCTION

The main purpose of this study was to investigate the utilisation of chest physiotherapy services at the UTH of Butare, in Rwanda. The results are discussed with reference to the aims and objectives of the study comparison to the related literature. Furthermore patient referrals, utilisation of CPT and factors that may impact on patient referral are discussed.

5.2 UTILISATION OF CHEST PHYSIOTHERAPY.

The researcher argues that the utilisation of a health service depends largely on the referral of patients to that service. Patient referral, in turn depends on the knowledge of, or experience of the referring practitioner with CPT.

5.2.1 Prevalence of respiratory problems and referral

From the sample of 700 hospital records retrieved, (312) patients had positive respiratory signs of cough, abnormal breathing pattern and abnormal breath sounds. It showed that (58) patients were referred for CPT during 2006. It is reasonable that among the 81.4% of patients with respiratory signs (n=254) who were not referred some of them may have been in need of CPT

(Figure 4.4). The majority of patients (642) were not referred either because they did not require CPT or for some other reasons. Although there was no association between department and patients referral (p- value=0.057) (Table 4.7) the department of pediatrics shows the highest percentage (18.6%) of referrals, followed by internal medicine, when compared with other departments. Physicians seem to see children with respiratory problems more often than any other chronic health problem. Furthermore children are relatively more likely to be hospitalised due to respiratory problems. The fact that children are more affected than adults is due to the difference in their respiratory systems. Airways narrowed and any limitation to airflow caused by sputum retention or bronchospasm cause respiratory distress (Canadian Association of Physicians for the Environment 2000). Children's lungs are anatomically and physiologically different from adults, but the structure changes during child growth and becomes like adult (Smith and Ball, 1998).

Barben and Hammer (2003) revealed that in Switzerland one third of paediatricians prescribe chest physiotherapy to children with respiratory problems. Paediatric respiratory physicians tend to use more bronchodilators and corticosteroids as well as antibiotics and chest physiotherapy than the general paediatricians. Furthermore, the physiotherapy department records showed that only (56) received CPT during 2006, giving an average new patient treatment rate of (5) patients per month.

The researcher is of the opinion that more patients with positive respiratory signs could have benefited from CPT. However, the researcher acknowledges that not all underlying pathologies resulting in cough, abnormal breathing pattern and abnormal breath sounds can be treated with

CPT, since patients with chronic respiratory conditions may have irreversible damage to the lungs, resulting in these permanent abnormal signs.

It was further observed that more patients are referred for CPT in June and October and this could possibly relate to the change in climate in June which is the onset of summer and October which is the onset of a rainy season. Loscertales et al (2002), in a study carried out in a rural district hospital in southern Mozambique between October 1998 and May 2000 found that RSV is a major cause of lower respiratory tract infection in infants throughout that district. The cases were presented in predictable yearly outbreaks during the warm and rainy seasons.

According to The Lung Association (2007), climate change may have an impact on health. High temperatures, especially over several days, and elevated air pollution have resulted in high morbidity and mortality rates in some regions. For example in France in 2003, thousands of deaths were attributable to the warm weather. Also heavy cold weather can affect vulnerable populations like the very young, the elderly, those with pre-existing respiratory diseases, such as asthma or COPD, or cardiovascular disease. In some persons, winter and summer can cause fevers, aches, and respiratory problems because of the fluctuations in climatic temperature.

5.2.2 Referral trends among physicians

The researcher argues that the utilisation of CPT depends on referral of patients in need and those potentially in need of CPT. Most of the physicians (75%) referred between 1 and 5 patients per week for chest physiotherapy during 2006 (Table 4.11). Hendricks et al (2003), as cited by (Malambo, 2005), highlighted the role of Primary Care Physicians (PCP) in health care

utilisation in the Netherlands as the gatekeepers controlling the distribution of resources to the various health care providers. However, Hendricks' study on referral patterns and utilisation of physiotherapy services revealed that 70% of patients with impairment that were referred directly by primary care physicians for physiotherapy had improved. This indicates that a good working relationship between physicians and physiotherapists would improve access to the service and could improve the quality of life of patients at the UTH of Butare.

Mitchele and Lissovoy (1997) demonstrated that access to physiotherapy services in many states in the USA is dependent on the decision of the physicians to refer or not to refer the patient to a physiotherapist. Some physicians revealed that patient access to physical therapists' services without their referral means removal of the mandate given by state law to refer patients to physical therapists' services. However, other states have enacted legislation enabling consumers to obtain physical therapy without referral by a physician. The study revealed that the majority of the physicians didn't allow nurses to refer patients for chest physiotherapy. However, it is not common for hospitalised patients to request doctors to refer them to other specialists. All referrals and special tests are usually done at the discretion of the doctor. Less than fifty percent of the physicians referred patients to chest physiotherapy (Table 4.11). Most of the physicians (25%) indicated that they refer patients in seriously compromised situations. The main role of physicians is to make a medical diagnosis of patients and to provide medical intervention, prevention, continuity of care, and referral of patients to other levels of health professionals if found necessary (Mitchele & Lissovoy, 1997). At the UTH it is compulsory for all patients with or without health insurance to be referred by physicians to other health services such as physiotherapy.

In the absence of published literature related to this study the researcher did not find literature on studies to support or to reject the results of this study. According to Mitchele & Lissovoy (1997), patient referral depends on physicians' attitudes to make a referral of patients to other levels of health professionals.

5.2.3 Factors associated with referral and utilisation

The study did not find any associations between factors that may have had an impact on the referral of patients for CPT by physicians. However in spite of the lack of statistically significant referral factors, referral trends were identified among physicians' at the UTH, and these are discussed below. In contrast the researcher identified associations between variables in the sample of patients selected from the hospital records and referral for CPT.

5.2.3.1.1. Physicians' perception of knowledge of CPT

No associations were found between physicians' perception of their own knowledge of CPT and referral. Although the majority (65%) of the physicians perceived that they had sufficient knowledge of CPT, a greater majority (95%) needed to know more about CPT (Table 4.12). According to Hebert, et al (2001), chest physiotherapy prevents and manages pulmonary disease before and after surgery, and reduces morbidity after major abdominal surgery. It reduces the incidence of pulmonary complications after major abdominal surgery from 27% to 6%. This implies that, on average, one pulmonary complication is prevented for every five patients treated with physiotherapy. Chest physiotherapy, if started early, is of most benefit to patients at highest risk of post-operative complications. There are reports of immediate radiological improvement

following chest physiotherapy intervention (Willis & Prasad, 1999). Ciesla, et al (1981), revealed that chest physiotherapy is the choice treatment of the lungs for both preventing and treating pulmonary complications caused by retained secretions. The beneficial results of chest physiotherapy include improvement in chest wall appearance, arterial blood gases, and lung compliance. It is evident that chest physiotherapy is successful despite the presence of severe trauma and possible contraindications. The potential benefits of chest physiotherapy may outweigh the existing possible contraindications in case a patient is very congested.

5.2.3.1.2 Stage of the condition and referral

Most physicians (25%) refer when the situations are seriously compromised and the same applies to patients with chronic respiratory conditions (Table 4.11). Patients with COPD were identified on admission to hospital and were referred to the physiotherapist prior to discharge (Pye, 2007). Benefits were seen in the more severe patients however, with a significant reduction in both length of stay and total hospitalisation days. The number of admissions increased, but the length of stay decreased significantly with CPT from a median of 12 to 5 days (Pye, 2007). Systematic reviews on RCTs research on the benefits of cardiopulmonary rehabilitation in patients with chronic respiratory diseases revealed numerous benefits. The strength of evidence was mainly level A and B, regarded as strong evidence and a few of level C and D, regarded as inconclusive evidence (Wright, 2007). A study on patients with low back pain by Feldman, Rossignol, Abenhaim and Gobeille (1996), demonstrated that physicians request physical therapy services based on certain patient characteristics. Patients who were referred earlier tended to return to work sooner than those who were referred later, which indicates that timing of physical therapy is an important factor in the rehabilitation of workers with low back pain. Of the cohort, 389

subjects (18%) had received physical therapy after referral by their physicians and treatments have been administered. Implementation of physical therapy within one month of back injury had a strong protective effect on return to work within 60 days.

5.2.3.1.3 Experience with benefits of CPT

The majority of the physicians (70%) found CPT beneficial “sometimes”, while fewer reported benefits “only in certain cases” (10%) and “always” (15%). Although this result is not statistically significant, this response should be of concern to physiotherapists. Various factors should be taken into consideration when outcomes with CPT are assessed, namely the type of condition, stage of conditions and the extent of permanent lung tissue damage. According to Pitta, Vanessa and Garrod in Pryor and Prasad (2008) some respiratory problems can only benefit from CPT up to a certain stage.

5.2.3.1.4 Physicians’ communication with physiotherapists

A small percentage of the physicians (25%) communicate with physiotherapists (Table 4.16). This can be seen as inadequate communication between physicians and physiotherapists. The researcher argues that the lack of communication between physicians and physiotherapists may be the reason why some physicians ignore the role played by physiotherapy services. It is alarming to note that only 25% of the physicians communicated with physiotherapists. Philipp and Dodwell, (2005) revealed that communication is a core component of professionalism which requires competency in medical practice. They have expected to work constructively within teams and to respect the skills and contributions other team members’ include physiotherapists. It is reasonable therefore to expect good communication skills to be acquired, retained and utilized

in all matters involving communication among physicians and other health workers, as well as within clinical teams and even patients.

5.2.3.2 Respiratory signs and referral

Highly significant associations were found between the prevalence of respiratory signs, hospital departments, period of stay and patient referral. Since a problem-based approach is advocated for clinical decision-making in physiotherapy, the physiotherapist requires a thorough knowledge of the underlying pathophysiology of the cardiorespiratory system.

The researcher will highlight the effects of CPT on the respiratory problems associated with cardiorespiratory dysfunction. According to Jenkins, Tucker and Cecins in Pryor and Prasad (2008) common respiratory problems such as, dyspnoea , reduced exercise tolerance, impaired airway clearance, airflow limitation, reduced lung volume, respiratory muscle and breathing dysfunction resulting from respiratory or cardiovascular disease may be managed by physiotherapists.

There was a highly significant association between respiratory signs in the sample and referral status. In contrast there was a large proportion of patients with respiratory signs (81.4%) such as cough, abnormal breathing pattern and abnormal breath sounds, who were not referred for CPT. However; the researcher argues that not all of these signs caused by their different underlying pathologies can be relieved by CPT, although improvement in general wellbeing and quality of life can be obtained. However the improvements observed in HRQOL was considered clinically significant. According to Pitta, Prost, & Garrod in Pryor & Prasad (2008), the absence of

improvement should thus not be regarded as a failure in outcomes and is therefore not a sufficient reason to deny patients access to pulmonary rehabilitation.

Guell, et al (2005) reported that a chronic obstructive pulmonary disease gradually impairs the patient's overall physical function and the economic impact is great. A study by Remera (2004 p.p 50 unpublished thesis) revealed that the majority of the physiotherapists 57% who participated in the study had a positive perception of chest physiotherapy for asthmatic children. Other physiotherapists in general found a favor of chest physiotherapy for a variety of respiratory problems. The study revealed physiotherapists believe that chest physiotherapy is beneficial not only for people suffering from asthma, but based on their experience, even for other respiratory problems.

Mackay, Ellis and Johnston (2005) disclosed that chest physiotherapy for patients after abdominal surgery could improve respiratory and physical function and reduce the incidence of postoperative pulmonary complications. This intervention may include lung expansion exercises, secretions clearance techniques, limb exercises and progressive mobilisation. The same authors did a study with 50 participants divided into two groups both performing deep breathing exercises and coughing. One group was supervised by physiotherapists while the other was not. The group supervised by physiotherapists showed improvement at 17% and those not supervised showed an improvement at 14%. However, the difference was not highly significant. Schwartzman, et al (2001) revealed that, as mentioned earlier, physiotherapists' mission is to treat patients and to create awareness among medical staff and nurses within a multidisciplinary framework. Specific goals are to clear airways, to avoid hospital admissions where possible and

to permit earlier discharge from hospital to lessen the burden on the emergency department. This an integrated approach to patient care. Braverman (2004) reported that there is a strong association between excess/retained pulmonary mucus and morbidity, hospitalisations, mechanical ventilation dependence and mortality. The presence of excess mucus or retained mucus affects pulmonary function, pulmonary health and survival. In several ways and excess/retained secretions result in diminished pulmonary function, airway obstruction, mucus plugging, impaired mucociliary clearance function, increased risk for infection, acute lobar collapse, respiratory failure and need for mechanical ventilatory support. Hence CPT may help in reducing the onset of these complications.

5.2.3.2.1 Cough

This current study revealed that cough was found to be one of the respiratory signs among patients at the UTH of Butare. Cough and expectoration of mucus are common symptoms for which patients seek medical attention (Irwin and Madison 2000, Van der Schans, et al 1999). Cough is abnormal if it is persistent, painful or productive of sputum. It may be underestimated by smokers and people who swallow their sputum. Similarly sputum expectoration is always abnormal because daily secretions are swallowed in healthy people (Hough, 1991). The researcher argues that a cough is probably the reason for patients' self-imposed limitation in their activity level. In turn this results in sputum retention and persistent ineffective coughing. When patients have an ineffective cough, overproduction of sputum and sputum retention increase which may require assistance from physiotherapists. Complications arising from sputum retention can lead to the development of chest infections, atelectasis and compromised respiratory function which can also result in respiratory failure and morbidity (Irwin and

Madison 2000). Physiotherapists could advise patients early on breathing exercises to minimize the effects of degenerative changes in the lungs.

Willis and Prasad (1999) found that the intention in using CPT is to remove airway obstruction, reduce airway resistance, enhance gas exchange, reduce the work of breathing and reduce hospital admission. In the acute situation, recovery should be hastened and in patients with a chronic respiratory disorder, the progression of the lung disease is hopefully delayed. The most applied intervention is the use of chest physiotherapy to increase bronchial mucus transport among patients with respiratory problems and reduce retention of mucus in the airways.

5.2.3.2.2 Abnormal breathing patterns

Abnormal breathing patterns were also found as respiratory signs in the patient sample at the UTH. The normal breathing pattern is effortless, inspiration is active and expiration is passive. It has approximately 8-14 breaths per minute at rest involving three phases: an active inspiratory, a passive expiratory and a slight pause at the end of expiration. Lower chest expansion can be seen around waistline or palpated over the abdominal region (Innocenti, & Troup in Pryor & Prasad 2008). The accessory muscles of inspiration are the external intercostals muscles, the scalenes and sternocleidomastoid muscles. Although during normal resting breathing, expiration is passive and the muscles involved in expiration are the internal intercostals, rectus abdominals and transverses abdominals, etc (Smith, & Ball, 1998). Only under strenuous activity e.g. sprinting will the accessory muscles of respiration be recruited to actively assist in breathing. Abnormal distribution of pulmonary perfusion with hyperperfusion in the upper zone of the lung was found to be associated with the abnormal breathing patterns. These breathing patterns are

known to increase ventilation in the upper zones of the lungs and may indicate a compensatory mechanism serving to match ventilation and perfusion (Kawagoe, et al. 1988).

Morrison and Agnew (2007) state that breathing exercises have been shown to improve respiratory function, muscle endurance, increase sputum expectoration and higher level of aerobic fitness, and are correlated with a decreased risk of mortality. These authors argue that deep breathing exercises may have a role in aiding sputum expectoration in patients with cystic fibrosis, but should not be considered as a replacement for chest physiotherapy. Furthermore, breathing exercises can help in maintaining and enhancing functioning, health and psychological well-being among patients with respiratory problems.

5.2.3.2.3 Abnormal breath sounds

Abnormal breathing sounds were another respiratory sign found in the sample. However, Hanspasterkamp, Kraman, and Wodicka (1997) argue that not all lung sounds can be influenced by CPT. Some lung sounds can be normalised or reduced by clearing the airways of sputum, or by improving the aeration of under-ventilated parts of the lungs.

They further state that the breathing-associated sound heard on the chest wall of a healthy person is called the normal lung sound. The changes in lung structure that occur in disease affect the amplitude and timing of sound transmission from the airways to the chest surface. Not all abnormal lung sounds are reversible.

The researcher argues that when patients have spent a prolonged period on bedrest without moving, they need to be assisted with breathing exercises to minimise respiratory de-conditioning. This study showed that patients who have spent short and long terms in hospital have experienced more respiratory problems than others who passed moderate term.

Van der Schans, et al (1999) revealed that chest physiotherapy interventions can be evaluated using different outcome variables, such as bronchial mucus transport measurement, measurement of the amount of expectorated mucus, pulmonary function, medication use, frequency of exacerbation and quality of life. In normal lungs or breathing sounds, air entry when listening with a stethoscope over the chest wall can be compared with the sound of wind blowing through a tree. Abnormal breath (lung) sounds can be produced when the lung is not well aerated or when airways are narrowed through bronchospasm or sputum. The air moving through terminal bronchioles and alveoli also contributes to breath sounds. In normal breath sounds, bronchovesicular sounds, and vesicular sounds can result from improved transmission of breath sounds. They are normally heard over the trachea and larynx and bronchial sounds are not normally heard over the thorax (Hough, 1991).

5.2.4 The period of hospitalisation and presence of respiratory signs

Most of the patients with respiratory signs were those who spent short and long periods of hospitalisation. It is the researcher's opinion that when patients are admitted with an acute episode of a respiratory disease or an acute on chronic exacerbation of a disease, these patients are usually treated with medication, such as antibiotics, bronchodilators, mucolytics, oxygen support if necessary and CPT in the early phase. This is to prevent further complications known

as secondary prevention. Once the acute episode responds well to interventions in the early phase of hospitalisation, patients are usually discharged home after a short period of stay. Worldwide, chronic obstructive pulmonary disease is a leading cause of morbidity and mortality. Pulmonary rehabilitation (PR) can considerably alleviate the burden of this disease by reducing the number of hospitalisations, reducing respiratory symptoms such as dyspnea, and improving exercise performance as well as HRQOL. Reduced dyspnea during activities contributed most to the obtained improvements in HRQOL, thus underlining the specific importance of dyspnea as a major outcome measure for pulmonary rehabilitation. Moreover, it has been stated that benefits after PR are particularly great in patients with COPD (Von Leupoldt, et al. 2008). There was a highly significant association ($p=0.000$) between period of hospitalisation in days and presence of respiratory signs. Furthermore, no significant association ($p=0.142$) between length of stay in hospital and referral to CPT was found. Although the majority of patients were not referred for chest physiotherapy, most of the patients referred were among those in short and long term hospitalisation (Table 4.10).

5.3 REFERRAL SYSTEM

In the current study, it was shown that 25.0% of physicians “often” refer patients for chest physiotherapy and 70% of physicians “seldom” refer patients. At the UTH patients have difficulty in accessing physiotherapy services without being referred. Thus it seems that some physicians are not effectively utilising the referral system because they are not sufficiently informed on the benefits of CPT. It may therefore be easier for many physicians to prescribe medication than referring patients with respiratory problems for chest physiotherapy. The researcher argues that there is thus a need to improve the communication systems between the

physiotherapists and the physicians in order to refer more patients who could benefit from chest physiotherapy. Physiotherapists should be more proactive through awareness campaigns to inform the medical staff, especially physicians and nurses, about the short term and long term benefits of chest physiotherapy. There is a need for physicians to learn from other health professionals on what they could offer to the public in the common interest of patients. The present study also has shown that physicians at UTH did not allow nurses to refer patients for CPT. According to Parry (1995), as cited by Malambo (2005), physicians have enjoyed a position of power and control in the medical field for a long time. Consequently, it seems that many of them may learn from other members of the medical field who are not physicians.

Halpin and Miravittles (2006) revealed that as exacerbations and hospitalisations represent an important cost and morbidity of COPD, priority should be given to likely interventions such as chest physiotherapy which are aimed at delaying the progression of disease, preventing exacerbations, and reducing the risk of respiratory failure to alleviate the clinical and economic burden of disease.

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5.4 PERCEIVED KNOWLEDGE OF THE PHYSICIANS AND STAGE OF REFERRING PATIENTS

This study revealed that the majority of physicians (65%) are of the opinion that they are sufficiently informed about CPT. Thus, the physicians' need or no need for more information about CPT did not influence the patients' referral. Almost all of the physicians (95%) need to know more about chest physiotherapy. Physiotherapists could raise awareness among the health workers, especially the physicians and nurses at the UTH of Butare, to educate patients about the

benefits of CPT in cases of respiratory problems and the range of services that the physiotherapist can provide. However, no association was found between the need to know more about CPT and the stage of referring patients (Table 4.12).

McKenzie (2006) found that airflow limitation leads to non-homogeneous ventilation, while alveolar wall destruction and changes in pulmonary vessels reduce the surface area available for gas exchange. Pulmonary hypertension reflects pulmonary vasoconstriction due to hypoxia in poorly ventilated lung and vasoconstrictor peptides produced by inflammatory cells and vascular remodeling.

A study by Remera (2004 p.p 52) also disclosed that 86.6% of physiotherapists found the benefits of CPT for patients to include reduction of the use of medication which means lower costs to parents, reduced risk of non-compliance with taking medication, and lessen duration of hospitalisation. Most of the physicians (75%) found that chest physiotherapy is efficient. A related study by Holloway and Ram (2004) reported that chest physiotherapy is used for reducing medication usages, hospital stay and helping in mucus transport. It can enhance independence and quality of life. The above benefits can be important in encouraging the general public to contact a physiotherapist after being referred by a physician.

However, Remera study's (2004, p. 41) observed that 73% of caregivers were aware that for successful chest physiotherapy, the physiotherapists have to give advice to patients because the latter need good knowledge and skills on how to deal with severe respiratory disorders. Few physicians (15%) found that chest physiotherapy is always beneficial and (70%) noticed that

chest physiotherapy is sometimes beneficial. The researcher suggests that most of physicians may not take time to refer patient for CPT without expecting a good result because only (15%) found that CPT is always beneficial. Ciesla (1996) confirmed that many patients spontaneously breathing in the ICU and wards are unable to cough effectively because of respiratory muscle weakness, pain, or a decreased level of consciousness. They cannot be mobilized sufficiently to eliminate the sequelae of secretion retention due to the severity of injury or illness and the paraplegia.

Denehy and Berney, (2001) found that chest physiotherapy may further minimise pulmonary complications thereby reducing patient morbidity and preventing prolonged hospitalisation. The present study showed that referral is low and some physicians were not informed that patients with respiratory problems could benefit from chest physiotherapy that physiotherapists perform. Therefore, there is a need to sensitize the health workers on the role of physiotherapists at the UTH of Butare on the benefits of chest physiotherapy. The above need is also suggested by Kim (1997) in his study which reported that the management of mucous hypersecretion can be undertaken in two main ways: firstly, improved clearance by physical methods (CPT); and, secondly, by pharmacological methods (drugs).

According to the WHO (2001), the major lung conditions are characterised by reduction of lung volume and poor compliance due to impairment of the lung, pleura, chest wall and weakness of the neuromuscular mechanisms. Descramer, et al (2003) agree that chronic obstructive pulmonary disease is currently the fourth biggest cause of death in Europe and is predicted to become the third biggest worldwide by 2020.

5.5 LACK OF LITERATURE

It should be acknowledged that there is a lack of literature which addresses the specific issues investigated in this study on patient's referral and utilisation of health services in general but specifically related to this field of namely CPT, however there have been numerous studies on cardiopulmonary rehabilitation for COPD.

5.6 SUMMARY

In summarizing this chapter, the results highlighted the following, namely:

On account of the results of the present study, most physicians need to know more about chest physiotherapy; this may influence referral and increase the utilisation of CPT services among the patients with respiratory problems. When looking at the observed frequencies of patients with respiratory signs (312), the number referred (58), and the number who had received CPT(56), it can argued that more patients may have benefited from CPT. Further exploration of factors that could be associated with patient referral showed significant associations between selected independent variables identified in the hospital records. However, no statistically significant variables influenced the referral trends found among the physicians.

CHAPTER SIX

SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY

6.1 INTRODUCTION

This chapter gives a summary of the study. It highlights the important findings and concludes with limitations identified in the study.

6.2 SUMMARY OF THE STUDY

Future respiratory problems should be recognised at the UTH as major contributors to morbidity and mortality especially for patients who are confined to bed for a long period.

The aim of this study was to determine the utilisation of chest physiotherapy services at the University Teaching Hospital of Butare, in Rwanda. It served to identify the prevalence of patients with respiratory problems from the hospital who received CPT during 2006. The referral trends among physicians with regard to CPT, their experiences with referrals, and the benefits of chest physiotherapy were also examined.

The management of patients with respiratory problems seemed for a long time dependent on medication. Chest physiotherapy was not sufficiently recognised for its role in the management of individuals with respiratory dysfunction. This is verified by the fact that the researcher did not find a lot of literature on clinical studies on chest physiotherapy for respiratory problems. At the UTH of Butare physiotherapy is a relatively new health profession. Before 1994, the hospital made provision for the establishment of physiotherapy services at the UTH, but no physiotherapists were employed during that year. It is only in 1995 that physiotherapy services became fully active. Thus, it was hypothesised that the other health care professionals, such as nurses and physicians were not sufficiently aware of the roles that physiotherapists could play. Also, according to the experience of the researcher, very few physicians do refer patients with respiratory problems to physiotherapists for treatment

The participants were patients identified from hospital records, patients with respiratory problems who were treated in the physiotherapy department during 2006, and the physicians who worked in four departments' namely surgery, pediatrics, internal medicine and gynecology. The study revealed that the main signs for respiratory problems found were cough, abnormal breath sounds, and abnormal breathing patterns. A high percentage of physicians indicated that need to know more about CPT.

It is widely recognised that physicians are the main source of referral for chest physiotherapy. Regarding the benefits of chest physiotherapy, only 15 % of physicians found chest physiotherapy always beneficial. The cost and ignorance of chest physiotherapy by the patients could be a barrier for attendance. Other barriers could be lack of some physicians' knowledge on the benefits of CPT which may reduce referral.

6.3 CONCLUSIONS

According to the results of the study, it is found from the hospital records that 44.6% of the patients were found with positive respiratory signs. Many respiratory problems which are common at the UTH of Butare can be prevented, delayed in onset, or better managed by the combined efforts of medical staff and physiotherapists. With regard to the rate of patients referred for chest physiotherapy for the whole year 2006, the researcher considered that referral was very low at an average of 5 patients per month in a hospital with 500 beds.

At the UTH of Butare physicians and other health professionals should be aware of, and be involved in various health promotion activities aimed towards patients with respiratory problems, especially patients who are bedridden. The findings of this study point out that most of the physicians needed to know more about chest physiotherapy. There is still a need for improving physician's knowledge pertaining to the use of referral to chest physiotherapy which has been found to be beneficial to patients with respiratory problems in airway clearance. These findings indicate that physiotherapists should start public awareness at the UTH of Butare regarding chest physiotherapy.

The conclusion of the study is that among the many non-referred patients with positive respiratory signs CPT may have been required. This can be seen from the data which showed that among patients with positive respiratory signs only 8.3% were referred for CPT during 2006. This is an average of 5 patients per month.

6.4 RECOMMENDATIONS

Based on the results of this study the researcher proposes the following recommendations:

1. Physiotherapy services should be marketed highlighting their utility in the management of respiratory problems, including treatment, prevention, education, and rehabilitation of patients with chronic respiratory disease. Physiotherapists should promote more awareness among physicians and nurses in their departments about the potential benefits of chest physiotherapy, based on evidence through research.
2. Physiotherapists should attend ward rounds with physicians to facilitate the identification of patients with respiratory problems. This will also promote communication between physiotherapists and rest of health team.
3. Promote awareness among physicians on early referral of patients with respiratory problems in order to delay the development of chronic respiratory diseases and their impact on the quality of life of these patients.
4. A good system for tracking patients who have been referred from different departments to the physiotherapy department should be created.
5. More research should be conducted by physiotherapists to determine the utilisation of chest physiotherapy at the UTH. A prospective research design using a larger sample size should be done. There is a need for evidence-based research to determine outcomes of chest physiotherapy in the management of respiratory problems.
6. More studies in other health services could be carried out to identify patient referral trends for chest physiotherapy among physicians at other health service settings in Rwanda.
7. It is important that the physiotherapy department keeps accurate records of the patients referred for chest physiotherapy by obtaining the necessary information e.g. diagnosis and

associated respiratory problems. Physiotherapists should also document accurately assessment, treatments and treatment outcomes which can be used for further research.

8. Future studies could also consider the use a qualitative research method, utilising focus groups with physicians to get in-depth responses on their experience with CPT.

6.5 LIMITATIONS OF THE STUDY

It is necessary to note the limitations and weaknesses of this study. The first limitation of this study was that there was limited in referral for CPT or non-existent documented clinical research pertaining to outcomes with chest physiotherapy. However, numerous studies and systematic reviews on the benefits of cardiopulmonary rehabilitation in patients with COPD were identified. Another limitation is that it was not possible to track patient's numbers from hospital records to physiotherapy department because different file numbers are used when patients are referred to the physiotherapy department.

Recall bias was suspected since some participating physicians were asked to answer what happened one year ago. The lack of a standardised questionnaire tested for its reliability could have influenced the reliability of results obtained from the physicians who participated in the study.

The study assessed the utilisation of chest physiotherapy services and the effectiveness of chest physiotherapy in respiratory problems in general, and not the effectiveness of specific techniques.

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APPENDICES



UNIVERSITY *of the*
WESTERN CAPE

FACULTY OF COMMUNITY AND HEALTH SCIENCES

HIGHER DEGREES COMMITTEE

20th November 2007

TO WHOM IT MAY CONCERN

Dear Sir/Madam

Research Project of Mr. Sylvain Gasaraba (Student Number: 2742594)

This letter confirms that Mr. Gasaraba is a registered student in the Faculty of Community and Health Sciences at the University of the Western Cape. His research proposal entitled "***The utilisation of chest physiotherapy services at the University Teaching Hospital of Butare in Rwanda***" submitted in fulfilment of the requirements for Masters in Physiotherapy has been examined by the Higher Degrees Committee and found to be of high scientific value, methodologically sound and ethical.

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

Sincerely


DR GAVIN REAGON

Chairperson: Higher Degrees Committee



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WESTERN CAPE

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Website: www.uwc.ac.za

21st November 2007

The Minister of Health, Republic of Rwanda

Dear Sir/Madam

Subject: Request to conduct a research study in Rwanda

I am a postgraduate Rwandan student doing a masters degree program in physiotherapy at the University of the Western Cape in South Africa. I am expected to conduct a research project as part of the requirement for a master's degree in physiotherapy. The title of my research thesis is: ***The utilization of chest physiotherapy services at the University Teaching Hospital (UTH) of Butare in Rwanda.***

I hereby request your permission to conduct the study based at the UTH of Butare. It is hoped that the result of this study could determine whether the physiotherapy service is being utilized effectively and whether more patients can benefit from chest physiotherapy at the UTH of Butare and increase the awareness among nurses and medical staff of the role of chest physiotherapy in the management of patients with respiratory dysfunction.

The study requires me to analyse hospital records and physiotherapy patients' records. I would be very grateful if you could allow me access to the documents in order to carry out the study between December 2007 and January 2008.

In a letter to the participants, it will be indicated that participation in this study will be voluntary. Ethical issues relating to confidentiality will be respected by researcher as all information will be anonymous. A copy of my research proposal is available on request. Ethical clearance for the study was granted by the Senate Research Committee of the University of the Western Cape.

I look forward to your reply.

Sincerely

.....
Sylvain Gasaraba R.
Masters student
e-mail: sylvaingasaraba@yahoo.com

.....
Mrs. M. Marais
Supervisor
e-mail: mnmarais@uwc.ac.za



3354

**MINISITERI Y'UBUZIMA****B.P 84 KIGALI**Website : www.moh.gov.rw**IBIRO BYA MINISITIRI**

FAX : (250) 576853

TEL : (250) 577253

Bwana GASARABA Sylvain
University of the Western Cape
Private Bag X 17, Bellville 7535
SOUTH AFRICA

Impamvu: Uruhushya rwo gukora ubushashatsi

Bwana,

Mpereye ku ibaruwa yawe wanditse usaba uruhushya rwo gukora ubushakashatsi mu rwego rwa Physiotherapy mu Bitaro bya Kaminuza y'u Rwanda i Huye, nkwandikiye nshaka kukumenyeshya ko urwo ruhushya urwemerewe ariko kandi nkakugira inama yo kubanza kubiganiraho n'Abayobozi b'iby'Bitaro.

Nkwifurije akazi keza.

Minisitiri w'Ubuzima

Dr. Jean Damascène NTAWUKULIRYAYO

Bimenyeshajwe:

- Bwana Umunyamabanga wa Leta muri Minisitiri y'Ubuzima Ushinzwe Kurwanya SIDA n'Izindi Ndware z'Ibyorezo
- Madamu Umunyamabanga Uhoraho muri Minisitiri y'Ubuzima **KIGALI**
- Bwana Umuyobozi Mukuru w'Ibitaro bya Kaminuza/CHUB **BUTARE**

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21st November 2007

The Director of University Teaching Hospital (UTH)
P.B 254 Butare
RWANDA

Dear Dr Rukeribuga Nicodeme

Subject: Request to conduct a research study in UTH, in Rwanda

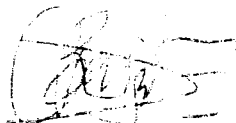
I am a postgraduate Rwandan student doing a masters degree program in physiotherapy at the University of the Western Cape in South Africa. I am expected to conduct a research project as part of the requirement for a master's degree in physiotherapy. The title of my research thesis is: ***The utilization of chest physiotherapy services at the University Teaching Hospital of Butare in Rwanda.***

I hereby request your permission to conduct the study based at the hospital. It is hoped that the result of this study could determine whether the physiotherapy service is being utilized effectively and whether more patients can benefit from chest physiotherapy at the UTH. The study requires me to analyse hospital records and physiotherapy patients' records. I would be very grateful if you could allow me access to the documents in order to carry out the study between December 2007 and January 2008.

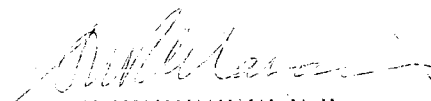
Ethical issues relating to confidentiality will be respected by researcher as all information will be anonymous. A copy of my research proposal is available on request. Ethical clearance for the study was granted by the Senate Research Committee of the University of the Western Cape.

I look forward to your reply.

Sincerely



Sylvain Gasaraba R.
Masters student
e-mail: sylvain.gasaraba@yahoo.com



Mrs. M. Marais
Supervisor
e-mail: mmarais@uwc.ac.za





CENTRE HOSPITALIER UNIVERSITAIRE
UNIVERSITY TEACHING HOSPITAL

CENTRE HOSPITALIER UNIVERSITAIRE
DE BUTARE (CHUB) RWANDA
CABINET DU DIRECTEUR GENERAL
CABINET OF GENERAL DIRECTOR

Huye, le 04/12/2007
Ref. : CHUB/DG/RN/NS/570/2007

✓ **Mr. GASARABA Sylvain**
Masters Student
E-mail: sylvaingasaraba@yahoo.com

RE: YOUR REQUEST

According to your request letter of 21st November 2007, I would like to inform you that it has been positively considered.

However, you will be allowed access to our records and our any assistantship to carry out your study.

I hereby precise that you will hold responsibilities for safety and confidentiality of the documents and records set for your use.

Yours Sincerely,

Dr. RUKERIBUGA Nicodème
General Director of CHUB



E-mail : chub@rwanda1.com
Website : www.chub.org.rw

B.P : 254 BUTARE
TEL: (250) 530 545/531073

Medical File (January to December 2006)

Appendix F

ID no	No File	Dptment	Gender	Age	Adm date	Disch date	PHDWMY	BM D	MP	RC	TRP	Referred	RNAP	PR

Dptment: Department
 Adm date: Admission date
 Disch date: Discharge date
 PHDWMY: Period of Hospitalizations, Days/Weeks/Month/Y ear
 MP: Main problem admitted for
 BMD: Basic medical diagnosis
 RC: Respiratory complications
 TRP: Type of respiratory problem
 RNAP: Referred not attending physiotherapy service

ID no: Number of identification
 PR: Physiotherapy received

Appendix G

Fiche Médicale (Janvier jusqu' en Décembre 2006)

NoI	NoF	Dept	Genre	Age	DAd	DSO	PHISMA	ProbMajHo	DiagnM	ComplResp	SPR	Trans	TAK	R
D								sp	E			s		K

NoID : Numéro d'identification

Sexe

Age

Dad : Date d'admission

PHISMA : Période d'hospitalisation, Jours, semaines, Mois, Année

DiagnMe: Diagnostic médical élémentaire

SPR : Sortes de problèmes respiratoires

RK: Recus en Kiné

TAK: Transférés pour aller en Kiné

NoF : Numéro de la fiche

DSO : Date de sortie

Complresp: Complication respiratoire

Trans : Transférés

Appendix H

Physiotherapy patient Record (January to December 2006)

ID no	No from physio patient record	Referring Department	Gender	Age	In patient	Out patient	Diagnosis	Main problem referred for	Treatment received

- IDno: Number of identification
- NR: No from physio patient record
- RD: Referring Department
- Sex: Male or Female
- Age: Child or adult
- IP: In patient
- OP: Out patient
- Diagnosis
- MPR: Main problem referred for
- TR: Treatment received

Appendix I

Cahier d' Enregistrement en kinésithérapie (Janvier jusqu' en Décembre 2006)

NoID	NoEnr	DeptRef	Genre	Age	Hosp	Amb	Diagn	H&ATrans en kiné	ProbMajtrans	Trtmt kiné

No ID = Numéro d'identification
 NoEnr = Numéro d'enregistrement en kiné
 DeptRef = Département de référence
 Hosp = Hospitalisés
 Amb = Ambulants

ProbMajtrans = Problème majeur de transfert
 TrtmtKiné = Traitement kinésithérapique reçus
 Diagn = Diagnostics
 H&A Trans en Kiné = Hospitalisés et ambulants transférés en kiné

Appendix J

Physicians' referral for the chest physiotherapy

Questionnaire for physicians

Male

Female

Age

Department:

Instructions

You are kindly requested to answer all the questions

Put the sign X in the square

1. For how long have you practiced as a physician?

0-5 years

6-10 years

11-15 years

16-20 years

More than 20 years

2. I refer the patients for chest physiotherapy

Never

Seldom

Often

3. I find chest physiotherapy beneficial for the patients I have referred

Only in certain cases

Sometimes

Always

4. In your experience indicate how many patients you refer per week for chest physiotherapy

None (0)

Very few (1-5)

Many (>6)

5. At what stage of the respiratory problem do you refer a patient for chest physiotherapy?

From the moment you make a preliminary diagnosis?

Depend on chest x-ray confirmation?

Prophylactically e.g. prolonged bedrest, generalized weakness, pre & post-operative

Only in seriously compromised respiratory function?

Chronic respiratory conditions?

Other (explain below)

.....
.....

6. Would you allow a nurse to refer a patient for chest physiotherapy?

Yes

No

7. Are you sufficiently informed about the benefit of chest physiotherapy?

No

Yes

8. Would you like to know more about chest physiotherapy?

No

Yes

9. Based on your experience, how do you rate the physiotherapy service for the patients you referred for chest physiotherapy?

Poor

Efficient

Highly efficient

10. Do you communicate directly with the physiotherapists concerning your patients' progress?

No

Seldom

Yes

11. Do you remember if you had referred patients for chest physiotherapy last year (2006)?

Yes I referred

No I didn't refer

Thank you for your time

Appendix K

**L'attitudes des médecins envers les patients transférés pour kinésithérapie
respiratoire**

Questionnaire pour les médecins

Masculin

Féminin

Age

Département:

Instructions

Vous êtes gentiment invités à répondre à toutes les questions

Mettez le signe X dans la case appropriée

1. Combien de temps avez-vous travaillé comme médecin?

0- 5ans

6-10ans

11-15ans

16-20ans

Plus de 20ans

2. Je transfère les malades pour la kinésithérapie respiratoire

Jamais

Rarement

Souvent

3. Je trouve la kinésithérapie respiratoire bénéfique pour les malades que j'ai transférés

Jamais

Rarement

Souvent

4. A partir de votre expérience pouvez- vous indiquer combien de malades que vous transférez par semaine pour la kinésithérapie respiratoire?

Aucun

Très peu

Beaucoup

5. A quelle stade transférez- vous un malade en kinésithérapie respiratoire?

A partir du moment ou vous posez le diagnostic préliminaire?

Ça dépend du résultat confirmatif de la radiologie?

Prophylaxie ex. longtemps alite, ex. faiblesse généralisée, pré et post opératoire

Seulement en cas de complication respiratoire ?

En cas de maladies respiratoire chronique?

Autres (expliquer en bas)

.....

.....

6. Autorisez-vous une infirmière de transférer un malade pour la kinésithérapie respiratoire?

Oui

No

7. Avez-vous assez d'informations suffisantes sur la kinésithérapie respiratoire?

No
Oui

8. Voulez-vous connaître plus sur l'importance de la kinésithérapie respiratoire?

Non

Oui

9. Basé sur votre expérience comment classez-vous le service de kinésithérapie pour les patients que vous avez transférés pour la kinésithérapie respiratoire?

Pauvre

Efficace

Très efficace

10. Est-ce que vous communiquez directement avec les kinésithérapeutes concernant l'évolution de vos malades? Pensez-vous que la kinésithérapie respiratoire est efficace pour quelqu'un qui est très longtemps alité?

Non

Rarement

Oui

11. Est-ce que vous vous rappelez si vous avez transféré les malades en kinésithérapie respiratoire l'année passée (2006)?

Oui j'ai transféré

No je n'ai pas transféré

Merci

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CONSENT FORM

Title of Research Project: The utilisation of chest physiotherapy services at the University Teaching Hospital of Butare in Rwanda.

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

Participant's name.....

Participant's signature.....

Date.....

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

Study Coordinator's Name: Sylvain Gasaraba R.

University of the Western Cape

Private Bag X17, Belville 7535

Fax: (021)959-1217

Cell: 08510956/+27783957662

Email: sylvaingasaraba@yahoo.com



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Tel: +27 21-959, Fax: 27 21-959

E-mail:

FORMULAIRE DE CONSENTEMENT

Titre du projet de recherche: L'utilisation de la kinésithérapie respiratoire à l'Hôpital Universitaire de Butare au Rwanda.

L'étude a été décrite à moi dans la langue que je comprends et j'accepte librement et volontairement de participer. Mes questions au sujet de l'étude ont été répondues. Je comprends que mon identité ne sera pas révélée et que je peux me retirer de l'étude à tout moment sans aucune raison et ceci ne m'affectera pas négativement de n'importe quel façon.

Le nom du participant.....

Signature du participant.....

Date

Si vous avez des questions concernant cette étude ou souhaitez signaler n'importe quels problèmes que vous avez éprouvé relative à l'étude, contacter svp le coordonnateur d'étude:

Le nom du coordonnateur d'étude: Sylvain Gasaraba R.

University of the Western Cape

Private Bag X17, Belville 7535

Telephone: (021)959-2542

Fax: (021)959-1217

Cell: 08510956/+27783957662

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INFORMATION SHEET

Project Title: The utilisation of chest physiotherapy services at the University Teaching Hospital of Butare in Rwanda.

What is this study about?

This is a research project being conducted by Sylvain Gasaraba R., MSc student in Physiotherapy department at the University of the Western Cape, South Africa. We are inviting you to participate in this research project because you fulfil all the requirements of my study. The purpose of this research project is to determine the utilisation of, and need for chest physiotherapy at the UTH of Butare in Rwanda.

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

You will be asked to complete the questionnaires administered to you. It will take you about 20-25 minutes.

Would my participation in this study be kept confidential?

We will do our best to keep your personal information confidential. To help protect your confidentiality, your name will not be included on collected data and codes will be used on data forms. If we write a report or article about this research project, your identity will be protected to the maximum extent possible.

What are the risks of this research?

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

What are the benefits of this research?

This research is not designed to help you personally, but the results may help the investigator to learn more about the utilisation of chest physiotherapy at the University Teaching Hospital of Butare in Rwanda. We hope that, in the future, the results of this study will help the doctors and physiotherapists in management of patients with respiratory problems.

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?

There is assistance available in Hospital to help you if you are negatively affected by participating in this study.

What if I have questions?

This research is being conducted by Sylvain Gasaraba R. MSc student in Physiotherapy department at the University of the Western Cape, South Africa. If you have any questions about the research study itself, please contact Sylvain Gasaraba R. at:

Email: sylvaingasaraba@yahoo.com

Cell: 08510956/ +27783957662

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

Head of Department: Prof. Jose Frantz

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

University of the Western Cape

Private Bag X17

Bellville 7535

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



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FEUILLE DE L'INFORMATION

Titre du projet: L'utilisation de la kinésithérapie respiratoire à l'Hôpital Universitaire de Butare au Rwanda.

De quoi s'agit cet étude?

C'est un projet de recherche conduit par Sylvain Gasaraba R., étudiant en kinésithérapie à l'université du Western Cape en Afrique du Sud. Nous vous invitons à participer à cette recherche parce que vous accomplissez les conditions demandées par cette étude. Le but de ce projet de recherche est de déterminer l'utilisation et le besoin de la kinésithérapie respiratoire à l'Hôpital Universitaire de Butare au Rwanda.

Qu'est-ce que je serai invité à faire si j'accepte de participer?

Vous serez invités à remplir les questionnaires que nous allons distribuer à vous. Ça vous prendra 20-25 minutes.

Ma participation à cette étude serait-elle maintenue confidentielle?

Nous ferons notre meilleur pour maintenir votre information personnelle confidentielle. Pour aider à protéger votre confidentialité, votre nom ne sera pas inclus sur des données rassemblées que nous emploierons, des codes seulement sur des formulaires de données. Si nous écrivons un rapport ou un article concernant ce projet de recherche, votre identité sera protégée jusqu'au degré maximum possible.

Quels sont les risques de cette recherche ?

Il n'y a aucun risque connu lié à la participation à ce projet de recherche.

Quels sont les avantages de cette recherche ?

Cette recherche n'est pas conçue pour vous aider personnellement, mais les résultats peuvent aider l'investigateur à apprendre plus au sujet de la connaissance sur l'utilisation de la kinésithérapie respiratoire à l'Hôpital Universitaire de Butare. Nous espérons que, dans l'avenir, les résultats de cette étude aideront les médecins et les kinésithérapeutes en prise en charge de malades qui ont les problèmes respiratoires.

Est-ce que je peux être dans cette recherche et je peux cesser de participer à tout moment?

Votre participation à cette recherche est complètement volontaire. Vous pouvez choisir de ne pas participer du tout. Si vous décidez de participer à cette recherche, vous pouvez cesser de

participer à tout moment. Si vous décidez de ne pas participer à cette étude ou si vous cessez de participer à tout moment, vous ne serez pas pénalisés ou perdre aucun avantage.

Si j'ai des questions?

Cette recherche est conduite par Sylvain Gasaraba R., étudiant en kinésithérapie à l'Université du Western Cape en Afrique du Sud. Si vous avez des questions au sujet de cette recherche, entrez svp en contact avec Sylvain Gasaraba R.:

Email: sylvaingasaraba@yahoo.com

Telephone: 08510956/ +27783957662

Si vous avez des questions concernant cette étude et sur vos droits en tant que participant ou si vous souhaitez signaler n'importe quels problèmes rencontrés relatives à l'étude, entrez svp en contact avec:

Chef de département: Prof. Jose Frantz

Doyen de la faculté des sciences de la Communauté et de santé: Prof. Ratie Mpofu

University of the Western Cape

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Cette recherche a été approuvée par le sénat de recherches et du Comité d'éthique à l'Université du Cape Town.



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