

https://dspace.org/

The prevalence and nature of work related musculoskeletal disorders amongst phsiotherapists in Zimbabwe

Pfumojena, Chido Carol

2016-02-26
http://hdl.handle.net/10539/19746

Downloaded from a DSpace repository. https://dspace.org/

THE PREVALENCE AND NATURE OF WORK RELATED MUSCULOSKELETAL DISORDERS AMONGST PHYSIOTHERAPISTS IN ZIMBABWE

Chido Carol Pfumojena

A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science in Physiotherapy.

Johannesburg, 2015

DECLARATION

I, Chido Carol Pfumojena declare that this research report is my own work. It is being submitted for the degree of Master of Science in Physiotherapy in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

……..

Signature of Candidate

……..day of…….month, 20….

DEDICATION

To the Almighty for His grace, love and mercy that have brought me this far;

To my parents and brother, thank you for your love and support.

ABSTRACT

Work related musculoskeletal disorders (WMSD) are induced or aggravated by work and the circumstances of its performance (World Health Organization 2003). Physiotherapists are at risk of work related musculoskeletal disorders (WMSD) due to the physically demanding nature of their job.

The aim of this study was to establish the prevalence and nature of WMSD amongst physiotherapists in Zimbabwe and the coping mechanisms used to manage them. A cross-sectional quantitative descriptive study design was used and data was collected using a self-administered questionnaire that was either emailed, hand delivered or posted to participants.

There were 101 participants making a response rate of 56.4%. There were more female (60.4%) than male (39.6%) physiotherapists. Physiotherapists were mainly working in government (30.7%) and undertaking general practice. The career prevalence of WMSD amongst physiotherapists in Zimbabwe was 86.1% (n=87). The highest prevalence of WMSD was in the low back (79.3%) (n=69). The major risk factor to WMSD amongst physiotherapists in Zimbabwe was “treating a large number of patients a day” and “inadequate training in injury prevention” was a minor risk factor. The most common coping mechanism used by physiotherapists in Zimbabwe to reduce strain on their bodies when working was “modifying the patient’s/physiotherapist’s position”. It was found that physiotherapists in Zimbabwe only “sometimes” used coping mechanisms thought to be effective in reducing strain on their bodies. The greatest impact WMSD had on the work of physiotherapists was modifying their physiotherapy techniques.

The prevalence of WMSD was found to be high amongst physiotherapists in Zimbabwe and the low back was the area of the body most affected. Physiotherapists in Zimbabwe were faced with having to treat large numbers of patients a day and as a result they had to modify the patient’s position, their position and their physiotherapy techniques. Despite the high career prevalence of WMSD amongst Zimbabwean physiotherapists, they were neither changing their duties nor considering leaving the profession or retiring early.

It is recommended that risk assessment and control of WMSD be on-going in Zimbabwean health institutions to help minimize them and their effects amongst physiotherapists. It is also recommended that research be conducted into the psychosocial effects of WMSD on the lives of physiotherapists. It is also recommended that health promotion on WMSD be on-going amongst physiotherapists in Zimbabwe.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to the following people for their help and support in the preparation of this research report:

- Dr Morake Douglas Maleka (Principal supervisor)
- Mrs Vaneshveri Naidoo (Co-supervisor)
- Professor Hellen Myezwa (Head of Department)
- Professor Witness Mudzi (Post-graduate course co-ordinator)
- Ms Ropafadzo Banhwa (Research assistant)
- Members of the panel of experts for their professional help in the content and construct validation of the questionnaire: Ms Annalie Basson, Dr Benita Olivier, Dr Ronel Roos and Ms Anelenie Smit.
- All physiotherapists who participated in this study

TABLE OF CONTENTS

		Page
	Declaration…….……....	ii
	Dedication…….……..	iii
	Abstract…….……..	iv
	Acknowledgements.....……..	v
	Table of Contents…….……....	vi
	List of Tables…….……..	ix
	List of Abbreviations……..…..…….……....	x
1.	**Chapter 1: Background and Need**.....	1
1.1	Introduction……....	1
1.2	Problem Statement…….....	2
1.3	Research Aim ……..…….….....	3
1.4	Research Objectives.....	3
1.5	Significance of the Study…….....	3
2.	**Chapter 2: Literature Review**…….....	5
2.1	Introduction…….……....	5
2.2	Definition of WMSD…….……....	5
2.3	The Prevalence and Body Areas Affected by WMSD…….……....	6
2.4	Perceived Causes and Predisposing Factors.....	7
2.4.1	Personal Factors.....	7
2.4.2	Activity Related Factors, Posture and Workload Issues……...	9
2.5	Coping mechanisms.....	10
2.6	Perceived impact……	12
2.7	Review of Methodology.....	13
2.8	Conclusion ……..…….….....	14
3.	**Chapter 3: Methodology**.....	15
3.1	Introduction…….……....	15
3.2	Study Design…….……....	15
3.3	Setting…...…….……....	15
3.4	Participants…….……....	15

		Page
3.4.1	Source of Participants	15
3.4.2	Sample Selection	15
3.4.3	Inclusion Criteria	16
3.4.4	Exclusion Criteria	16
3.5	Instrumentation	16
3.5.1	Description of Questionnaire Sections	16
3.6	Validity	17
3.7	Reliability of Questionnaire	17
3.8	Pilot Study	17
3.8.1	Methodology of Pilot Study	18
3.9	Main Study	18
3.10	Ethical Considerations	19
3.11	Data analysis	19
4.	**Chapter 4: Results**	20
4.1	Introduction	20
4.2	Results of Pilot Study	20
4.3	Response Rate of Main Study	21
4.4	Demographics of Sample Size	21
4.5	Career Prevalence of WMSD	23
4.6	Areas of the Body Affected by WMSD	23
4.7	Perceived Causes and Predisposing Factors	24
4.8	Coping Mechanisms	25
4.9	Perceived Impact	26
4.10	Conclusion	27
5.	**Chapter 5: Discussion**	28
5.1	Introduction	28
5.2	Response Rate of Study and Participants' Demographic Information	28
5.3	Career Prevalence	28
5.4	Areas of Body Affected by WMSD	30
5.5	Perceived Causes and Predisposing Factors	30
5.6	Coping Mechanisms	31
5.7	Perceived Impact	32
5.8	Conclusion	33

		Page
6.	**Chapter 6: Conclusion, Limitations and Recommendations**…….....	34
6.1	Introduction…….....	34
6.2	Conclusion.....	34
6.3	Limitations of Study….....	35
6.4	Recommendations…….....	36
6.4.1	Recommendations for Physiotherapists.....	36
6.4.2	Recommendations for Future Research.....	36
7.	**References**…….....	37
Appendix 1	: Ethics Clearance Certificate……..…….....	39
Appendix 2	: Letter of Approval from MRPCZ…….....	41
Appendix 3	: Information to Participants: Main Study.....	42
Appendix 4	: Information to Participants: Pilot Study.....	44
Appendix 5	: Questionnaire.....	47
Appendix 6	: Permission from Author 1…….....	54
Appendix 7	: Permission from Author 2…….....	55
Appendix 8	: Recommendations from panel of experts……	56
Appendix 9	: Qualifications of panel of experts……	57

LIST OF TABLES

Page

Table 2.1	:	Prevalence of WMSD……	6
Table 4.1	:	Current demographics, area of employment and area of clinical practice…	22
Table 4.2	:	Career Prevalence of WMSD …….....	23
Table 4.3	:	First Experience of WMSD……	23
Table 4.4	:	Body Area of WMSD……..	24
Table 4.5	:	Perceived Causes and Predisposing Factors to WMSD.....……..…….	25
Table 4.6	:	Coping Mechanisms Employed by Physiotherapists for WMSD……	26
Table 4.7	:	Perceived Impact of WMSD on Physiotherapists…….	27

LIST OF ABBREVIATIONS

MRPCZ	- Medical Rehabilitation Practitioners Council of Zimbabwe
WHO	- World Health Organisation
WMSD	- Work related musculoskeletal disorders
ZPA	- Zimbabwe Physiotherapy Association

CHAPTER 1

1. BACKGROUND AND NEED

1.1 INTRODUCTION

The term “musculoskeletal disorders” denotes health problems of the loco-motor apparatus, that is, muscles, tendons, the skeleton, cartilage, ligaments and nerves. Musculoskeletal disorders include all forms of ill-health ranging from light transitory disorders to irreversible disabling injuries. Work related musculoskeletal disorders (WMSD) are induced or aggravated by work and the circumstances of its performance (World Health Organization 2003).

Body regions most commonly involved are the low back, neck, shoulder, forearm, and hand (Punnett et al 2004). Examples of work conditions that may lead to WMSD include routine lifting of heavy objects, daily exposure to whole body vibration, routine overhead work, work with the neck in a prolonged flexed position, or performing repetitive forceful tasks. These conditions may lead to WMSD such as strains, sprains, carpal tunnel syndrome, back pain and hernia (Centres for Disease Control and Prevention 2013).

WMSD are recognised as a leading cause of significant human suffering, loss of productivity and economic burdens on society (Canadian Centre for Occupational Health and Safety 2002). Health care professionals including physiotherapists are all people engaged in the promotion, protection or improvement of the health of the population (World Health Organization 2007). However during their expert management of patients, health care professionals are at risk of injury. This has resulted in high rates of employee injury in the health care industry (Passier et al 2011).

Physiotherapists play a major role in the management of various conditions in the population (Queensland Health 2010). Despite their knowledge of nature, cause and management of WMSD, physiotherapists are at risk of injury themselves due to the physically demanding nature of the job (Cromie et al 2000; West et al 2001; Glover 2002) which involves considerable amounts of bending, reaching, twisting and awkward positioning (Useh et al 2002).

The career prevalence of WMSD amongst physiotherapists has been found to range from 40% to 91%. Low back, neck, upper back and thumb WMSD are some of the more

common injuries reported by physiotherapists (Nordin et al 2011). Nordin et al (2011) also implicates areas of specialty in contributing to WMSD amongst physiotherapists with musculoskeletal outpatients, neurological rehabilitation and elderly care viewed as playing a major contributory role.

Various coping mechanisms are used by physiotherapists to help reduce strain on their bodies when they are working such as modifying the patient's position and adjusting plinth/bed height (Cromie et al 2000; Nkhata et al 2010). WMSD have varying consequences on the work of physiotherapists with some modifying their treatment techniques and also seeking various methods of treatment while others have left the profession altogether (Cromie et al 2000).

1.2 PROBLEM STATEMENT

A lot of research has been done in developed countries on WMSD amongst physiotherapists with some research focusing on a particular part of the body (Cromie et al 2000; Glover 2002; Campo et al 2008; Passier et al 2011).

Not much research has been done in Africa regarding WMSD. One study was found that was done in Zimbabwe (Useh et al 2002). This study investigated the prevalence, severity, risks, occupational safety and responses of physiotherapists to WMSD but did not look at the coping mechanisms which physiotherapists use when working, which the researcher also aims to investigate. Coping mechanisms would be used to minimise both the risks and effects of WMSD (Cromie et al 2002). This could assist in informing policy on possible methods and changes that could be implemented to prevent or at best reduce injuries amongst physiotherapists. When the high prevalence rates of WMSD found in some studies are considered, it is of paramount importance that coping mechanisms used by physiotherapists are considered as valuable information.

Since 2003 Zimbabwe has undergone numerous socioeconomic changes including brain drain that is, the loss of skilled, technical and intellectual labour and changes in standards of service delivery and the health delivery sector has not been immune to these changes. The health system (physiotherapy included) is very challenged in terms of human resources for health, health financing, medicines and equipment, and overall service delivery (World Health Organization 2013). These changes are likely to impact on the workload that physiotherapists are now encountering in comparison to 10 years ago. WMSD are supposed to be causally linked to physical load resulting from occupational activities (World Health Organization 2003).

Hence, considering the importance of coping mechanisms and the socioeconomic changes Zimbabwe has undergone, the researcher found it important to investigate the prevalence and nature of work related musculoskeletal disorders amongst physiotherapists in Zimbabwe in order to add to the current body of knowledge.

RESEARCH QUESTION: What is the prevalence and nature of work related musculoskeletal disorders amongst physiotherapists in Zimbabwe and what are the coping mechanisms used to manage them?

1.3 RESEARCH AIM

The aim of this study was to establish the prevalence and nature of work related musculoskeletal disorders amongst physiotherapists in Zimbabwe and the coping mechanisms used to manage them.

1.4 RESEARCH OBJECTIVES

The objectives of this study were to determine:

1. The current demographics of physiotherapists in Zimbabwe.
2. The career prevalence and areas of the body affected by work related musculoskeletal disorders amongst physiotherapists in Zimbabwe.
3. The perceived causes and predisposing factors of work related musculoskeletal disorders amongst physiotherapists in Zimbabwe.
4. The coping mechanisms used to manage work related musculoskeletal disorders amongst physiotherapists in Zimbabwe.
5. The perceived impact of work related musculoskeletal disorders on the work of physiotherapists in Zimbabwe.

1.5 SIGNIFICANCE OF THE STUDY

By establishing the prevalence and nature of WMSD, the researcher aims to raise awareness amongst physiotherapists in Zimbabwe on the possible risks involved in their work. Determining the coping mechanisms and perceived impact of work related musculoskeletal disorders will allow physiotherapists to share ideas and develop methods of best practice resulting in suitable modifications, risk reduction and most importantly better service delivery to the patient. This will also add to the body of knowledge on the

prevalence of WMSD amongst physiotherapists in Zimbabwe and Africa. Information derived from this research could also be used to inform insurance companies to develop disability insurance products suitable for physiotherapists.

CHAPTER 2

2. LITERATURE REVIEW

2.1 INTRODUCTION

This chapter focuses on reviewing literature relevant to this study whose aim was to establish the prevalence and nature of WMSD amongst physiotherapists in Zimbabwe and the coping mechanisms used to manage them. The literature was sourced from Pubmed, Ebsco and Scopus databases. Literature from the year 2000 to date was reviewed with the aim of obtaining the most current data on the subject of WMSD. The key words used to obtain the relevant articles were work related musculoskeletal disorders, prevalence, injuries and physiotherapy. Literature discussing the prevalence and nature of WMSD and coping mechanisms used to manage these was reviewed under the following headings:

2.2 Definition of WMSD.
2.3 The prevalence and body areas affected by WMSD amongst physiotherapists.
2.4 The perceived causes and predisposing factors of WMSD amongst physiotherapists.
2.5 The coping mechanisms used to manage WMSD by physiotherapists.
2.6 The perceived impact of WMSD on the work of physiotherapists.
2.7 Review of methodology.
2.8 Conclusion.

2.2 DEFINITION OF WMSD

In literature there is no definitive definition of WMSD. Authors used a variety of definitions for WMSD. Cromie et al (2000) defined a WMSD as a "job related ache or pain" while West et al (2001) defined a WMSD as "pain lasting more than 3 days that you feel was caused by your work as a physiotherapist".

Campo et al (2008) defined WMSD as "work related pain or discomfort that lasted for more than 3 days in any body part in the last 12 months" while Salik et al (2004) defined WMSD as "pain or discomfort experienced at some time in their occupational lives".

Alrowayeh et al (2010) defined WMSD as "musculoskeletal complaints" while Adegoke et al (2008) defined WMSD as "discomfort, injuries or pain due to the physiotherapist's work". Although the wording of the definitions used by authors varied, their definitions were fairly similar because they all centred around 'pain arising from ones work' and what differed were the time frames this pain was restricted to. In line with definitions found in literature,

WMSD in the current study were defined as 'any pain/discomfort/injury arising from ones work as a physiotherapist in their career'.

2.3 THE PREVALENCE AND BODY AREAS AFFECTED BY WMSD

The prevalence rates of WMSD amongst physiotherapists differed across studies with researchers recording twelve month, twenty-four month and career or life time values. The prevalence values were likely to differ because of the varying time spans used by different authors to determine them. Table 2.1 shows the prevalence found in various studies.

Table 2.1: Prevalence of WMSD

Author	Country/Area	Prevalence
Cromie et al (2000)	Victoria, Australia	Career-91%
West et al (2001)	Queensland, Australia	Career-55%, 12 month-40%
Glover et al (2005)	United Kingdom	Career-68%, 12 month-58%
Campo et al (2008)	United States of America	Career-60%, 12 month-28%
Salik et al (2004)	Turkey	Career-85%
Nordin et al (2011)	Malaysia	12 month-71.6%
Alrowayeh et al (2010)	Kuwait	12 month-47.6%
Useh et al (2002)	Zimbabwe	Career-77.6%
Adegoke et al (2008)	Nigeria	12 month-91.3%
Nkhata et al (2010)	Zambia	12 month-68.3%

The most common WMSD in Cromie et al's (2000) study was that of the low back with 48% of the physiotherapists reporting low back pain. The neck and upper back both had the second highest prevalence of WMSD at 12.2%. The thumbs had the third highest prevalence at 11%. West et al (2001) found that the low back was the most common site of injury at 35% followed by the hand at 25% where the thumbs and wrists were more commonly affected. The neck had an injury prevalence of 24% in this study.

Glover et al (2005) found that the low back was the area most affected by WMSD at 44%. Campo et al (2008) found that the greatest proportion of new cases of WMSD was in the low back followed by wrist and hand then neck and shoulders. Salik et al (2004) found that the low back was the most prevalent WMSD complaint at 26%, wrist and hand 18%, shoulder 14% and neck at 12%.

Nordin et al (2011) found that the low back had the highest prevalence of injury at 51.7% followed by the neck at 46.5% and thoracic spine at 44.8%. The hands and wrists had a prevalence of WMSD of 12% while the elbows were at 8.6%. In Alrowayeh et al's (2010) study, the low back was found to be the most common complaint. This was followed by the neck, the upper back and then the shoulder. Hand/wrist had the same prevalence with knee

complaints, then the ankle/foot, followed by the elbow. The least prevalent WMSD were in the hip and thigh.

In Africa only three studies on the prevalence of WMSD were found. Nkhata et al (2010) found that the low back was affected the most at 52.4% followed by the shoulders 30.5%, upper back 26.8%, neck 25.6% and wrist/hands 15.9%. Adegoke et al (2008) found the low back had the greatest prevalence of WMSD at 69.8% followed by the neck 31.1%, shoulders 22.2% and wrist and hands at 20.6% while Useh et al (2002) found that 77.6% of participating physiotherapists had experienced WMSD at some point in their career. The highest prevalence of WMSD was in the low back at 52.1%, in the upper back 34.6%, 32.5% in the thumbs, 30.4% in the wrists and hands and 8.3% in the neck. However, this study did not look at the coping mechanisms employed by physiotherapists to deal with WMSD.

2.4 PERCEIVED CAUSES AND PREDISPOSING FACTORS

A range of perceived causes and predisposing factors of WMSD have been discovered in studies that have previously been done. They can be grouped into activity related factors, postural factors, workload issues and personal factors (Cromie et al 2000).

For the purposes of this literature review, the same grouping shall be used but activity related factors will be looked at together with workload issues and postural factors while personal factors will be looked at alone.

2.4.1 Personal Factors

Personal factors could include age, gender, years of experience, body mass index (BMI) and psychosocial issues.

The prevalence of WMSD in Cromie et al's (2000) study was higher in younger physiotherapists. This finding is in contrast to Graham et al (2005) who found that recently qualified physiotherapists in Glasgow, Scotland felt they were immune to WMSD due to their training in injury prevention. In a Zimbabwean study by Useh et al (2002), younger therapists reported more upper back and thumb symptoms than older physiotherapists which was a similar finding by Cromie et al (2000). The most prevalent WMSD of low back pain in Alrowayeh et al's (2010) study affected younger age groups more than older groups. Nkhata et al (2010), Glover et al (2005), Adegoke et al (2008), Useh et al (2002) and West et al (2001) also found that physiotherapists experiencing WMSD had their first onset in

the first five years after graduation. Nkhata et al (2010) concluded that younger physiotherapists have less experience in patient handling and may be embarrassed to ask for help when doing strenuous tasks, which predisposed them to injury.

Useh et al (2002) also found that fewer male therapists suffered from WMSD than their female counterparts with females reporting more low back and neck symptoms than males. This finding is comparable to Nordin et al (2011) and Adegoke et al (2008) who found that female physiotherapists had a higher prevalence of WMSD. Alrowayeh et al (2010) also found that the most common WMSD of low back pain affected more female physiotherapists than males. In contrast to these studies, McMahon et al (2006) found a greater prevalence of WMSD in male physiotherapists however, these WMSD were restricted to only the thumbs.

Campo et al (2008) in an American study found that female, older and more experienced physiotherapists were more likely to develop WMSD. Although the finding on gender was similar to other studies (Useh et al 2002 and Nordin et al 2011), findings on age and years of experience were in contrast to studies done by Adegoke et al (2008) and Nkhata et al (2010). Females have been said to be physically weaker than males and thus could face challenges in physically demanding tasks (Nordin et al 2011).

King et al (2009) in a study comparing WMSD amongst older and younger physiotherapists found that older and younger physiotherapists had similar injury incidence rates. The differences were seen in the days spent away from work due to injury and severity of pain suffered with older physiotherapists taking more time off and suffering more severe pain.

Contrasting results were found on the effects of BMI on predisposing physiotherapists to WMSD. Nordin et al (2011) found that physiotherapists with a BMI greater than 25 had the highest prevalence of WMSD and they attributed this to the fact that people with high BMI values were likely to be overweight and thus less physically active. In contrast, Darragh et al (2009) and Nkhata et al (2010) found no relationship between BMI and WMSD for physiotherapists while Useh et al (2002) and Adegoke et al (2008) found that physiotherapists with low BMI were more likely to suffer WMSD because they were likely to be weaker.

Campo et al (2008) suggested that psychosocial factors also play a significant contributory role in the development of WMSD. Psychosocial factors such as high job demands and job pressure have been found to be related to the development of WMSD (Lee et al 2011).

2.4.2 **Activity Related Factors, Posture and Workload Issues**

Activity related factors could include work setting, working hours, exercise habits, work postures and movements.

A systematic review by Sharan et al (2012) summarised the findings in most studies on perceived causes and predisposing factors of WMSD amongst physiotherapists. The major perceived causes and contributing factors found were performing manual therapy techniques, repetitive movements, awkward and static postures, physical load, lifting and transferring, treating large numbers of patients and working while injured.

Most studies found task repetition, work positions/posture, lifting or transferring patients and treating large numbers of patients a day as major contributing factors to WMSD (Cromie et al 2000; West et al 2001; Salik et al 2004; Glover et al 2005; Adegoke et al 2008; Nkhata et al 2010 and Passier et al 2011). Cromie et al (2000) went on to specify that it was lifting heavy and dependent patients that contributed to WMSD where 43.6% of physiotherapists found it a major contributing factor while in West et al's (2001) and Campo et al's (2008) studies it was found that these major contributing factors mainly caused spinal (neck, mid and low back) WMSD. Physiotherapists in Passier et al's (2011) study also reported that due to treating large numbers of patients a day, they tended not to do their work properly thus also increasing the risk of injury to either themselves or the patients that is, due to work pressure and the need to complete tasks they were forced to 'cut corners' so that job targets were met. In the same study it was also found that limitations in equipment, flaws in their design, storage of equipment in crowded or distant locations and inadequate maintenance of equipment were predisposing factors to WMSD.

Some work related factors were found to be insignificant in predisposing physiotherapists to WMSD. Cromie et al (2000) and Nkhata et al (2010) found that physiotherapists felt that inadequate training in injury prevention played a minor role in their WMSD. In fact, Cromie et al (2000) found that inadequate training in injury prevention, reaching or working away from the body, assisting patients with gait activities, carrying, lifting or moving heavy materials and equipment, working with confused or agitated patients and unanticipated movements by the patient were not related to WMSD. Adegoke et al (2008) also found working with confused or agitated patients and reaching or working away from the body as minor contributing factors to WMSD.

Certain job tasks and work settings were found to predispose physiotherapists to WMSD. Useh et al (2002) found that physiotherapists who performed manual therapy regularly were 2.5 times more likely to have wrist, hand and thumb symptoms than those who did not, which was a similar finding to Cromie et al (2000), West et al (2001) and Snodgrass et al (2002). Useh et al (2002) also found that physiotherapists working in hospital based settings had a greater prevalence of low back WMSD than their non-hospital based counterparts and this was found to be related to the fact that patients in these settings required more assistance in lifting and transfers than other settings. Campo et al (2008) found that the highest proportion of WMSD was found in physiotherapists working in the school system while physiotherapists working in acute care had the lowest prevalence of WMSD. Cromie et al (2000) found that physiotherapists working in private practice, sports and paediatrics had a higher prevalence of WMSD. Electrotherapy, cardiothoracic, neurological, hydrotherapy, general and out-patient rehabilitation, education, training and administrative tasks were not associated with WMSD.

Physiotherapists working in out-patient private practice in Useh et al's (2002) study had more WMSD in the thumbs, wrists and hands than their hospital based colleagues due to manual techniques being performed more frequently in out-patient private practice. Useh et al (2002) concluded that manual therapy techniques are a major predisposing factor to WMSD of the upper limb. Snodgrass et al (2002) in a discussion paper on thumb pain in physiotherapists found that there are intrinsic factors, technical factors and environmental factors that may contribute to thumb pain. Nordin et al (2011) like Useh et al (2002) and Cromie et al (2000) found that, manual techniques and lifting or transferring patients were major risk factors to WMSD. In contrast, Alrowayeh et al (2010) found no relationship between the two most common WMSD which were low back and neck pain with working venue, areas of specialty or exercise habits. However, hand and wrist symptoms were significantly associated with working in rehabilitation hospitals.

2.5 COPING MECHANISMS

Studies reviewed in this section revealed that physiotherapists employ a variety of coping mechanisms to deal with their WMSD. These coping mechanisms were employed by physiotherapists who had suffered from WMSD and also by those who had not.

Cromie et al (2000) also found that physiotherapists used a variety of coping mechanisms with the majority of them using an adjustable bed or plinth. They also used wheelie stools, lifting belts, slide boards and splints. Other coping mechanisms reported in Cromie et al's (2000) study were modifying the patient or therapist position, pausing to stretch or change

posture and warming up and stretching before performing manual techniques. Getting assistance with heavy patients decreased neck, shoulder, upper back, wrist, hand and thumb symptoms. The majority of therapists in this study almost never used electrotherapy over manual techniques to avoid stressing an injury but at times some of them reported using this strategy. Salik et al (2004) found that physiotherapists improved body mechanics, avoided lifting and changed positions frequently to cope with WMSD.

In Graham et al's (2005) study, physiotherapists felt that injury prevention strategies were not always used due to high case loads, time constraints, a desire to appear able to cope and moral obligations towards patients. Physiotherapists in this study did however feel that after an injury, they became more aware of risk factors and thus began taking precautions.

Campo et al (2008) suggested using equipment such as sliding boards, sit to stand devices, sliding sheets, lifting equipment and height adjustable plinths to reduce strain on physiotherapists' bodies. Campo et al (2008) also suggested manual lifting policies and lifting teams to reduce strain and also reported the benefits of physiotherapists using thumb splints, mobilisation and soft tissue devices.

Adegoke et al (2008) found that the most common coping mechanisms for physiotherapists were modifying their positions or the positions of their patients and selecting techniques that would not provoke their discomfort. The least common coping mechanisms employed were using electrotherapy instead of manual therapy and warming up and stretching before performing a manual technique.

Passier et al (2011) found that physiotherapists had a variety of coping mechanisms for WMSD. The ability of a physiotherapist to manage their workload was found to be an effective way to cope with WMSD. This included varying work tasks throughout a day by interspersing non-clinical tasks into work-load and controlling management of patient types. In this study it was found that although varying work tasks was an effective way of coping with WMSD, it was not always possible because it was dependant on availability of patients and other staff. Passier et al (2011) also reported that physiotherapists found applying ergonomic principles, use of manual handling skills, use of assistants and avoiding particular work tasks to be effective in coping with WMSD.

Sharan et al (2012) found that use of less manual therapy, formulation of new devices, workplace interventions, work schedule allocation, proper training and an on-going risk assessment and control were useful measures and suggestions to cope with WMSD.

2.6 PERCEIVED IMPACT OF WMSD

The impact of WMSD on the work of physiotherapists varied across studies. Cromie et al (2000) found that of the 91% of physiotherapists who had experienced WMSD, only 7.4% of them lodged for worker's compensation which was similar to Useh et al's (2002) findings where an even lower percentage of 2% of physiotherapists who had suffered a WMSD lodged a compensation claim. In Cromie et al's (2000) study, 13.6% of physiotherapists suffering from WMSD took sick leave while in Useh et al's (2002) study, 11.2% took sick leave. West et al (2001) found that 24% of physiotherapists took time off on sick leave while 4% lodged a worker's compensation claim. Salik et al (2004) found that 46% reported their WMSD to their employer.

Cromie et al (2000) found that the majority of physiotherapists were not prevented from working by a WMSD in the previous twelve months but 17.7% changed their area of specialty or left the profession altogether. The areas of practice left in this study due to WMSD were neurology and rehabilitation where 42% of participants left this area while 21% left manipulative therapy or private practice and 14.8% left orthopaedics. Although Cromie et al (2000) did not find neurology to be related to WMSD, a large number of physiotherapists still left this area possibly because patients in these areas are usually more dependent and thus the risk of injury is still perceived to be high. West et al (2001) found that 86% of physiotherapists modified their own treatment techniques while 41% changed their duties and 39% changed their work setting. Only a few physiotherapists left the profession due to WMSD however, 31% reduced their patient contact hours and 29% changed the types of patients they treated. Campo et al (2008) also reported physiotherapists either changing their work setting or leaving the profession however the numbers who did so were very low. Passier et al (2011) also reported that physiotherapists found they had to modify treatment techniques, rotate through different clinical areas and swap or give away scheduled over time and on call shifts as a result of WMSD.

Most studies found that physiotherapists had to start maintaining their own physical fitness as a result of their WMSD (Passier et al 2011; Sharan et al 2012 and Snodgrass et al 2002). Snodgrass et al (2002) went on to recommended exercises to strengthen muscles of the thumb such as abductor pollicis and longus and extensor pollicis and brevis as a possible way to improve stability of the carpometacarpal (CMC) joint of the thumb and thus reduce the risk of thumb WMSD. They also went on to suggest that interventions traditionally used in the conservative management of CMC joint arthritis could also help physiotherapists. Such interventions would include screening physiotherapy students for hypermobility syndromes and exercise.

Many studies reported that physiotherapists suffering from WMSD sought physiotherapy treatment from colleagues (Cromie et al 2000; West et al 2001; Glover et al 2005; Campo et al 2008; King et al 2009 and Alrowayeh 2010). In West et al's (2001) study, physiotherapists also took prescription medication for their WMSD while 42% saw a doctor. Only 3% of physiotherapists opted for surgery. Useh et al (2002) reported that physiotherapists saw a healthcare giver for their WMSD but did not specify the healthcare service sought. Campo et al (2008) and Salik et al (2004) also reported that physiotherapists sought help from physicians for their WMSD.

In contrast to other studies, in Kuwait, Alrowayeh et al (2010) found that physiotherapists neither adjusted their working habits, area of practice nor limited patient contact hours due to WMSD and they also did not take sick leave. Salik et al (2004) and Adegoke et al (2008) also found that the majority of physiotherapists in their study had neither permanently reduced patient contact hours nor limited their area of practice due to injury and the majority of physiotherapists who had suffered a WMSD said they would not consider a change of job due to their WMSD. This could be attributed to the fact that physiotherapists in these studies were exposed to similar work conditions (government settings) that did not allow for job flexibility and change.

2.7 REVIEW OF METHODOLOGY

The majority of studies reviewed in this section used self-administered questionnaires to collect data (Cromie et al 2000; West et al 2001; Useh et al 2002; Adegoke et al 2008 and Nkhata et al 2010). Researchers either used post, email or a research assistant delivered questionnaires to participants. The questionnaires used were based mainly on similar previously done studies and also the Nordic musculoskeletal questionnaire. The Nordic musculoskeletal questionnaire has been used in a wide range of occupational groups to evaluate musculoskeletal problems (Crawford 2007).

Passier et al (2011) and Graham et al (2005) used focus group discussions to report the prevalence of WMSD amongst physiotherapists. Passier et al (2011) combined both a self-administered questionnaire and a focus group discussion. Graham et al (2005) expected less inhibited responses from participants in the focus group discussion because they would have the mutual support of their peers.

The self-administered questionnaire method appeared to be a more effective way of collecting data from participants because a larger pool of participants was targeted, thus making it easier for results to be generalized to the population. Cromie et al (2000) had a

response rate of 67.9% (n=536), West et al (2001) had a response rate of 53% (n=412), Useh et al (2002) had a response rate of 72.2% (n=143) and Adegoke et al (2008) had a response rate of 58.1% (n=126). In comparison, in the focus group discussion by Graham et al (2005) (n=11).

2.8 CONCLUSION

The prevalence of WMSD amongst physiotherapists was high across studies reviewed in this section with the low back having the highest prevalence of injury. The neck, upper back, wrist, hands and thumbs also suffered significantly from WMSD.

Female, younger and less experienced physiotherapists appeared to suffer more from WMSD. It was a general trend that the WMSD suffered by physiotherapists were related to their work setting, working hours, exercise habits, work postures and movements with performing manual therapy techniques, repetitive movements, awkward and static postures, physical load, lifting and transferring, treating large numbers of patients and working while injured being perceived as major causes and predisposing factors to WMSD.

Physiotherapists tended to continue to work while injured and sought treatment from colleagues or other health care professionals. Limited numbers reported their injury to appropriate personnel.

Physiotherapists had a wide range of coping mechanisms for WMSD such as use of ergonomic principles and assistive devices but some reported that use of these mechanisms was dependent on workload, availability of assistance and availability of the assistive devices.

The next chapter, chapter 3 describes the methodology used in the current research.

CHAPTER 3

3. METHODOLOGY

3.1 INTRODUCTION

The methodology used in this study whose aim was to establish the prevalence and nature of WMSD amongst physiotherapists in Zimbabwe and the coping mechanisms used to manage them is described in this chapter. WMSD in the current study were defined as 'any pain/discomfort/injury arising from ones work as a physiotherapist in their career'.

3.2 STUDY DESIGN

This was a quantitative descriptive cross-sectional study.

3.3 SETTING

This study was conducted in Zimbabwe amongst physiotherapists working in both the public and private health sector as the target population.

3.4 PARTICIPANTS

Participants were all physiotherapists practicing in Zimbabwe and registered under the Medical Rehabilitation Practitioners Council of Zimbabwe (MRPCZ). Participants were also recruited from the Zimbabwe Physiotherapy Association (ZPA) because it was discovered that some registered physiotherapists in Zimbabwe did not appear on the MRPCZ's list. A total of 261 physiotherapists were found to be on the MRPCZ and ZPA registers. However, this figure of 261 physiotherapists obtained from the MRPCZ and ZPA was found to be out of date because some of the physiotherapists on the database had either retired, left the country or were no longer practising for personal reasons. This information was established when the RA made calls and sent emails to all possible participants on the databases enquiring on their preferred method of administration of the questionnaire. Hence the final number of physiotherapists meeting the inclusion criteria was 179.

3.4.1 Source of Participants

Participants were sought from all government and private hospitals, private practices and government and private rehabilitation facilities in Zimbabwe where physiotherapists work.

3.4.2 Sample Selection

A sample of convenience was used.

3.4.3 **Inclusion Criteria**

All practicing physiotherapists registered under the MRPCZ and members of the ZPA.

3.4.4 **Exclusion Criteria**

All non-practicing physiotherapists and those practicing abroad.

3.5 **INSTRUMENTATION**

A self-administered questionnaire was used. The questionnaire was developed by the researcher with the aid of literature based on previous studies of this nature that were done in Australia (Cromie et al 2000; West et al 2001). Permission to adapt the questionnaire was obtained from the authors (see Appendix 6). Diagrams used in the questionnaire were based on those found in the study on WMSD in physiotherapists in Kuwait by Alrowayeh et al (2010). Permission was obtained to use these diagrams from the author (see Appendix 7). The questionnaire included 5 sections:

- Section 1: demographic data;
- Section 2: prevalence and area of pain;
- Section 3: perceived causes and predisposing factors;
- Section 4: coping mechanisms; and
- Section 5: perceived impact of WMSD on the work of physiotherapists (see Appendix 5).

3.5.1 **Description of Questionnaire Sections**

This section describes the structure of the questionnaire. The questionnaire was adapted from two similar studies previously done in Australia (Cromie et al 2000; West et al 2001).The adaptation was necessary so that the questionnaire suited the Zimbabwean environment. In the demographic data section, information on age, gender, qualifications, years of experience, work status, work environment, hours worked per week and current employment was collected. In the prevalence and area of pain section, information on whether a WMSD had ever been experienced, specific parts of the body where pain could have been experienced and when it was first experienced was included. Diagrams similar to those seen in the study by Alrowayeh et al (2010) were used to identify specific areas of pain. WMSD were defined as any pain/discomfort/injury arising from ones work as a physiotherapist in their career. The perceived causes and predisposing factors section collected information on possible causes or risk factors and their level of contribution to WMSD while the coping mechanisms section sought information on methods

physiotherapists use to reduce strain on their bodies as they work. Both injured and uninjured physiotherapists responded to this section. The perceived impact section collected information on perceived consequences of WMSD on the work of physiotherapists.

3.6 VALIDITY

A panel of experts was sought from the University of the Witwatersrand Physiotherapy Department to establish the content and construct validity of the questionnaire. The panel of experts consisted of four physiotherapists with both research and work experience in WMSD (See Appendix 9). The questionnaire was sent to these physiotherapists and their input and suggestions (See Appendix 8) were incorporated into the final questionnaire.

The suggestions from the panel of experts ranged from adding more specific areas of the body such as forearms to establish area of pain (Section 2: Appendix 5), to adding more options to the risk factors section (Section 3: Appendix 5) such as malfunction of equipment.

3.7 RELIABILITY OF THE QUESTIONNAIRE

The reliability of the questionnaire was established using the test-re-test method to establish intra-rater reliability. This was done as part of the pilot study. A total of ten physiotherapists were asked to complete the questionnaire and the same physiotherapists had to complete the questionnaire one week later.

There were no conflicting responses when participants' responses were assessed after submission of the questionnaires.

3.8 PILOT STUDY

A pilot study was carried out using ten participants from the target population. The aim of the pilot study was to address any challenges that could occur in the main study by meeting the following objectives:

1. To assess whether the questionnaire was understandable to participants and the time taken to complete it.
2. To assess whether the questionnaire met the study's intended objectives.
3. To assess the reliability of the questionnaire.

3.8.1 **Methodology of Pilot Study**

The questionnaire was emailed to five participants and hand delivered to the other five participants. The participants were asked to complete the questionnaire on receiving it and were informed that they would receive another copy to complete a week later (See Appendix 4) for the information letter used in the pilot study.

3.9 **MAIN STUDY**

Permission was obtained from the MRPCZ to conduct the study (see Appendix 2).

Before administration of the questionnaire, the RA communicated with all possible participants either through telephone or email enquiring on which method of questionnaire would suit them most. The contact details (postal, email and telephone numbers) of participants were obtained from the MRPCZ and ZPA databases. For the main study, the researcher with the assistance of a research assistant (RA) distributed questionnaires either through email, post or the RA personally delivered and collected questionnaires from physiotherapists in all hospitals, private practices, and rehabilitation facilities in Zimbabwe.

Where post was used, each questionnaire package came with a cover letter explaining the purpose of the study and two self-addressed stamped envelopes (in case one of the envelopes got lost) for participants to send back to the researcher. When using email, the (RA) sent the questionnaire to each participant's personal email address. The completed questionnaires were returned via email to the RA. The RA also visited participants in their places of work and hand delivered the questionnaires to them and gave them a two week period to complete them after which the questionnaires were collected by the RA. The RA also received all questionnaires returned via post. The RA played a major role in administration of the questionnaire and data collection to minimise researcher bias.

Confidentiality was maintained at all times. All questionnaires were numbered and linked to names on a master list to allow follow up of non-respondents. To ensure anonymity, once all respondents returned their completed questionnaires, the name list was discarded and only the numbered list remained.

The RA sent regular reminders to participants who did not respond. This was done on a fortnightly basis via email or phone call over a period of 6 weeks from initial administration of the questionnaire.

3.10 ETHICAL CONSIDERATIONS

Ethical clearance was applied for and obtained from the University of Witwatersrand prior to commencement of the study (Clearance certificate number M140411 (Appendix 1). Permission was also sought and obtained from the MRPCZ (Appendix 2). No names or any identifying information were contained in the questionnaire. The questionnaire was coded. The coded list of names was kept separately from the questionnaire and it was destroyed once data collection was complete.

Completion of the questionnaire was regarded as consent to participate in the study. No monetary reward was offered to participate in this study, participation was voluntary and there were no repercussions or losses of benefits for not participating.

3.11 DATA ANALYSIS

This study was largely descriptive hence frequencies, percentages, means, standard deviations, tables and categorical variables were employed to analyse data after it had been loaded onto Microsoft Excel.

CHAPTER 4

4. RESULTS

4.1 INTRODUCTION

The results of this study whose aim was to establish the prevalence and nature of WMSD amongst physiotherapists in Zimbabwe and the coping mechanisms used to manage them will be presented under the following sections:

4.2 Results of pilot study.
4.3 Response rate of main study.
4.4 Demographics of sample size.
4.5 Career prevalence of WMSD.
4.6 Areas of body affected by WMSD.
4.7 Perceived causes and predisposing factors.
4.8 Coping mechanisms.
4.9 Perceived impact.

4.2 RESULTS OF PILOT STUDY

The objectives of the pilot study were:

1. To assess whether the questionnaire was understandable to participants and the time taken to complete it.

2. To assess whether the questionnaire met the study's intended objectives.

3. To assess reliability of the questionnaire.

Participants found the questionnaire understandable and it took them 10-15 minutes to complete it. The questionnaire also appeared to be meeting the study's objectives. A shortcoming of the questionnaire identified by participants was:

1. Access to email where most participants who received the questionnaire via email said they would have preferred a hard copy as they did not have ready access to email and internet.

In order to address the challenge of possible unavailability of internet and email for some participants, either a hard copy or email copy was made available to participants depending on their choice.

The questionnaire also appeared to be reliable because there were no conflicting responses when the test-re-test method was employed.

4.3 RESPONSE RATE OF MAIN STUDY

The questionnaire was sent to 179 physiotherapists which was the total number of physiotherapists on the MRPCZ and ZPA registers meeting the inclusion criteria. A total of 101 questionnaires were returned which represented 56.4% of the total population.

4.4 DEMOGRAPHICS OF SAMPLE SIZE

There were more female (60.4%) than male (39.6%) participants and the average age of participants was 34.5 years (SD ±9.5). The average hours worked per week by participants were 32.9 hours.

The majority of participants held a Bachelor's degree in physiotherapy (86.1%) and the average number of years worked by participants was 10.3 years. The current area of employment varied across participants with the majority (30.7%) working in government and the current area of practice being general practice with 73.3% of participants working in general practice. The majority of participants (84.2%) stated that they were in full time employment.

The full demographic data of the participants are presented below in table 4.1.

Table 4.1: Current demographics, area of employment and area of clinical practice n=101

Gender	
▪ Male	n= 40 (39.6%)
▪ Female	n=61 (60.4%)
Qualifications	
▪ Diploma	n=6 (5.9%)
▪ Bachelor's degree	n=87 (86.1%)
▪ Master's degree	n=7 (6.9%)
▪ Doctorate	n=0
▪ No response	n=1 (1%)
Full time	n=85 (84.2%)
Part time	n=16 (15.8%)
Current employment	
Private practitioner (practice owner)	n=24 (23.8%)
Government	n=31 (30.7%)
Both private and government	n=16 (15.8%)
Academia	n=5 (5%)
Private practitioner (employed in practice)	n=17 (16.8%)
Other	n=7 (6.9%)
No response	n=1 (1%)
Current area of clinical practice	
Neurology	n=8 (7.9%)
Sport	n=1 (1%)
Orthopaedics	n=9 (8.9%)
General practice	n=74 (73.3%)
Academia	n=3 (3%)
Paediatrics	n=6 (5.9%)
Other	n=0

4.5 CAREER PREVALENCE OF WMSD

The career prevalence for WMSD was found to be 86.1% where n=87 participants indicated that they had suffered from pain that the participant could attribute to arising from their work at some point in their career. The responses of participants are shown in table 4.2 below:

Table 4.2: Career Prevalence of WMSD n=101

Yes WMSD	n=87 (86.1%)
No WMSD	n=14 (13.9%)

The majority of participants (66.7%) first experienced a WMSD in the first five years after graduation. Table 4.3 below shows when a WMSD was first experienced.

Table 4.3: First Experience of WMSD n=87

In the first 5 years after graduation	n=58 (66.7%)
6-15 years after graduation	n=23 (26.4%)
More than 15 years after graduation	n=6 (6.9%)

4.6 AREAS OF BODY AFFECTED BY WMSD

The areas affected by WMSD are shown in table 4.4 below. The highest prevalence of WMSD was found in the low back at 79.3%, followed by the shoulder at 54%, upper back at 51.7% and thumbs at 50.6%. The chest, hip and thigh had the lowest prevalence of WMSD. The chest and hip both had a prevalence of 5.7% while the thigh had a prevalence of 4.6%.

Table 4.4: Body Area of WMSD n= 87

Body area	Prevalence of WMSD
Low back	n=69 (79.3%)
Shoulder	n=47 (54%)
Upper back	n=45 (51.7%)
Thumbs	n=44 (50.6%)
Neck	n=37 (42.5%)
Hands	n= 36 (41.4%)
Wrist	n= 23 (26.4%)
Headache	n=18 (20.7%)
Forearms	n=16 (18.4%)
Knees	n=14 (16.1%)
Ankles	n=11 (12.6%)
Elbows	n=9 (10.3%)
Feet	n=8 (9.2%)
Chest	n=5 (5.7%)
Hip	n=5 (5.7%)
Thigh	n=4 (4.6%)

(Participants could choose more than one body area)

4.7 PERCEIVED CAUSES AND PREDISPOSING FACTORS

The perceived causes and predisposing factors to WMSD are shown in table 4.5 below. The major perceived cause and predisposing factor to WMSD was found to be “treating a large number of patients a day” where 62.1% of participants stated that this was a major risk factor to WMSD. “Performing the same task over and over” followed where 55.2% of participants found this a major risk factor and “lack of assistive devices” was also found to be a major risk factor with 54% of participants implicating it as a risk factor. Another major risk factor identified was “performing manual orthopaedic techniques” where 52.9% of participants identified this as a major risk factor to WMSD. Other risk factors identified as major perceived causes and predisposing factors were “malfunction of equipment”, where 50.6% of participants identified this as a major risk factor and “lifting or transferring dependent patients which was identified as a major risk factor by 49.4% of participants.

Risk factors perceived to play a minor role in predisposing participants to WMSD were “inadequate training in injury prevention” at 63.2%, “carrying, lifting or moving heavy

materials or equipment" at 60.9%, "working with confused or agitated patients" at 55.2%, "work scheduling problems" at 49.4% and "unanticipated sudden movements or falls by the patient" at 48.3%.

Table 4.5: Perceived Causes and Predisposing Factors to WMSD n=87

Risk factors	Major	Moderate	Minor	No Response
Treating a large number of patients in one day	n=54 (62.1%)	n=21 (24.1%)	n=10 (11.5%)	n=2 (2.3%)
Performing the same task over and over	n=48 (55.2%)	n=22 (25.3%)	n=13 (14.9%)	n=4 (4.6%)
Lack of assistive devices and equipment e.g. hoists	n=47 (54%)	n=15 (17.2%)	n=20 (23%)	n=5 (5.7%)
Performing manual orthopaedic techniques (joint or soft tissue mobilization)	n=46 (52.9%)	n=16 (18.4%)	n=20 (23%)	n=5 (5.7%)
Malfunction of equipment eg beds that cannot be adjusted	n=44 (50.6%)	n=19 (21.8%)	n=21 (24.1%)	n=3 (3.4%)
Lifting or transferring dependent patients	n=43 (49.4%)	n=19 (21.8%)	n=20 (23%)	n=5 (5.7%)
Working in the same position for long periods	n=39(44.8%)	n= 15 (17.2%)	n=27 (31%)	n=6 (6.9%)
Continuing to work when injured or hurt	n=38 (43.7%)	n=19 (21.8%)	n=25 (28.7%)	n=5 (5.7%)
Bending or twisting your back in an awkward way.	n=34 (39.1%)	n=23 (26.4%)	n=27 (31%)	n=3 (3.4%)
Working in awkward or cramped positions	n=29 (33.3%)	n=25 (28.7%)	n=28 (32.2%)	n=5 (5.7%)
Reaching or working away from your body	n=22 (25.3%)	n=25 (28.7%)	n=32 (36.8%)	n=8 (9.2%)
Not enough rest breaks during the day	n=21 (24.1%)	n=34 (39.1%)	n=27 (31%)	n=5 (5.7%)
Work scheduling (over time, irregular shift, length of workday)	n=21 (24.1%)	n= 16 (18.4%)	n=43 (49.4%)	n=7 (8%)
Assisting patient during gait activities	n=18 (20.7%)	n=23 (26.4%)	n=39 (44.8%)	n=7 (8%)
Unanticipated sudden movements or falls by patient	n=17 (19.5%)	n=23 (26.4%)	n=42 (48.3%)	n=5 (5.7%)
Working at or near your physical limits	n=17 (19.5%)	n=31 (35.6%)	n=31 (35.6%)	n=8 (9.2%)
Carrying, lifting or moving heavy materials or equipment	n=15 (17.2%)	n=12 (13.8%)	n=53 (60.9%)	n=7(8%)
Working with confused or agitated patients	n=14 (16.1%)	n=16 (18.4%)	n=48(55.2%)	n=9 (10.3%)
Inadequate training in injury prevention	n=8 (9.2%)	n=17 (19.5%)	n=55 (63.2%)	n=7 (8%)

4.8 COPING MECHANISMS

Table 4.6 shows some of the coping mechanisms used by participants to reduce strain on their bodies when working. Participants suffering from WMSD and those who had never suffered from them were all asked to respond to questions in this section. The most commonly used coping strategy was modifying the patient's/physiotherapist's position

which was used by 61.4% of participants followed by adjusting plinth height before treating a patient which was used by 46.5% of participants. Participants' responses showed that the majority of them only "sometimes" used the coping strategies suggested. For example, 59.4% of participants "sometimes" got help to handle heavy patients and 59.4% of participants "sometimes" stopped a treatment if it aggravated any discomfort while 57.4% of participants "sometimes" paused regularly to stretch and 56.4% of participants either "sometimes" used a different part of their body to administer a manual technique or "sometimes" selected techniques that did not aggravate their discomfort. The least commonly used coping strategy was asking a technician treat a patient where 75.2% of participants indicated that they would "never" ask a technician to treat a patient. Warming up and stretching before performing a technique was also an uncommon coping strategy among participants with 74.3% never doing it.

Table 4.6: Coping mechanisms employed by physiotherapists for WMSD n=101

Strategies	Always	Sometimes	Never	No response
I modify patient's position/my position	n=62 (61.4%)	n=33(32.7%)	n=1 (1%)	n=5 (5%)
I adjust plinth/bed height before treating a patient	n=47 (46.5%)	n=30 (29.7%)	n= 20 (19.8%)	n=4 (4%)
I use a different part of my body to administer a manual technique	n=37 (36.6%)	n=57 (56.4%)	n=4 (4%)	n=3 (3%)
I get someone else to help me handle a heavy patient	n=31 (30.7%)	n=60 (59.4%)	n=7 (6.9%)	n=3 (3%)
I select techniques that will not aggravate or provoke any discomfort	n=30 (29.7%)	n=57 (56.4%)	n=11 (10.9%)	n=3 (3%)
I stop a treatment if it causes or aggravates any discomfort	n=19 (18.8%)	n=60 (59.4%)	n=19 (18.8%)	n=3 (3%)
I pause regularly so I can stretch and change posture.	n=16 (15.8%)	n=58 (57.4%)	n=23 (22.8%)	n=4 (4%)
I use electrotherapy more often to avoid stressing an injury	n=8 (7.9%)	n= 52 (51.5%)	n=36 (35.6%)	n=5 (5%)
I ask a technician to treat a patient	n=3 (3%)	n=17 (16.8%)	n=76 (75.2%)	n=5 (5%)
I warm up and stretch before performing a technique	n=1 (1%)	n=22 (21.8%)	n=75 (74.3%)	n=3 (3%)

4.9 PERCEIVED IMPACT

Table 4.7 shows the perceived impact of WMSD on the work of participants in this study. The greatest impact that WMSD had on participants was modifying their physiotherapy techniques and this was done by 81.6% of participants. Another impact that WMSD had on participants was seeking physiotherapy treatment with 71.3% of participants seeking treatment. Taking on an exercise or posture programme was another perceived impact of WMSD and was done by 62.1% of participants. Despite their WMSD, the majority of participants (88.5%) were not considering leaving the profession, 77% were not considering

retiring early, 73.6% did not consult the doctor or use braces or orthoses and 70.1% had not changed their duties, however 50.6% took medication for their WMSD.

Table 4.7: Perceived Impact of WMSD on physiotherapists n=87

Impact	Yes	No	No response
Modifying your physiotherapy techniques	n= 71 (81.6%)	n=12 (13.8%)	n=4 (4.6%)
Seeking physiotherapy treatment	n=62 (71.3%)	n=23 (26.4%)	n=2 (2.3%)
Taking on an exercise or posture programme	n=54 (62.1%)	n=30 (34.5%)	n=3 (3.4%)
Taking medication	n=44 (50.6%)	n=40 (46%)	n=3 (3.4%)
Changing your work setting	n=36 (41.4%)	n=48 (55.2%)	n=3 (3.4%)
Taking time off on sick leave	n=32 (36.8%)	n=51 (58.6%)	n=4 (4.6%)
Decreasing patient contact hours	n=25 (28.7%)	n=58 (66.7%)	n=4 (4.6%)
Changing your duties	n=23 (26.4%)	n=61 (70.1%)	n=3 (3.4%)
Using braces, splints or other orthoses	n=20 (23%)	n=64 (73.6%)	n=3 (3.4%)
Consulting a doctor	n=19 (21.8%)	n=64 (73.6%)	n=4 (4.6%)
Considering retiring early	n= 17 (19.5%)	n=67 (77%)	n=3 (3.4%)
Considering leaving the physiotherapy profession	n=5 (5.7%)	n=77 (88.5%)	n=5 (5.7%)

4.10 CONCLUSION

Chapter 4 focused on presenting the results of the current study. The next chapter, chapter 5 discusses the results presented in this chapter.

CHAPTER 5

5. DISCUSSION

5.1 INTRODUCTION

This chapter focuses on discussing the results of this study whose aim was to establish the prevalence and nature of WMSD amongst physiotherapists in Zimbabwe and the coping mechanisms used to manage them by relating them to similar studies done.

5.2 RESPONSE RATE OF STUDY AND PARTICIPANTS' DEMOGRAPHIC INFORMATION

The response rate for this study was 56.4%. Similar studies (Darragh et al 2009; Adegoke et al 2008; Cromie et al 2000 and Campo et al 2008) had response rates that varied from 36% to 93% and this study lies well within this range.

There were more female (60.4%) than male (39.6%) physiotherapists and these figures compare closely to those found on the MRPCZ register of the female to male ratio of physiotherapists. The gender distribution in this study was also similar to Useh et al's (2002) study on occupational injuries amongst Zimbabwean physiotherapists where males made up 33.6% of participants and females made up 66.4%. This is an indication that females still make up the bulk of physiotherapists in Zimbabwe. The female to male ratio of physiotherapists in this study could also be explained by the fact that physiotherapy has been found to be a female dominated profession the world over (Odebiyi 2005).

The average age of participants was 34.5 years while the average years of qualification for participants were 10.3 years and the majority of participants (84.2%) were working full time. Participants were mainly working in government and undertaking general physiotherapy practice. These findings were similar to Useh et al's (2002) study and also compare closely to figures found on MRPCZ registers.

5.3 CAREER PREVALENCE OF WMSD

The career prevalence of WMSD in this study was found to be 86.1%. This was established by asking participants whether they had ever suffered a WMSD in their career (see Question 1: Section 2: Appendix 5). This was similar to what was done by Salik et al (2004) who had a response rate of 85%. The prevalence in the current study could also be very similar to Salik et al's (2004) study because both studies had their participants coming from general/government hospital settings where the numbers of patients that require

treatment usually exceed the numbers of physiotherapists available thus possibly predisposing them to injuries.

The career prevalence of WMSD in this study was higher than West et al's (2001) (55%) (n=217, response rate=53%), Useh et al's (2002) (77.6%) (n=143, response rate=72.2%) and Glover et al's (2005) (68%) (n=3661, response rate=73.4%) studies and this could be attributed to the broader definition of WMSD used in the current study. The current study looked at "pain/injury/discomfort that the participant could attribute to arising from their work" while the others looked at "pain/injury/discomfort lasting more than three days that the participant could attribute to arising from their work".

Cromie et al (2000) had a higher career prevalence of WMSD of 91% and this could be because their study had a higher response rate of 67.9%. WMSD amongst physiotherapists has generally been recorded as high such that the more participants in a study, the more likely it would be to have a higher prevalence of WMSD in that sample population.

Other differences in prevalence rates from this study could be attributed to the time span that the prevalence was restricted to in the study for example, Alrowayeh et al (2010) (47.6%), Adegoke et al (2008) (91.3%), Nkhata et al (2010) (68.3%) and Nordin et al (2011)(71.6%) all looked at a twelve month prevalence of WMSD.

Despite these differences in time frames and definitions of WMSD used by authors in various studies, Nordin et al (2011) highlights that the prevalence of WMSD amongst physiotherapists is high and that should be the main cause for concern.

The majority of participants in this study (66.7%) first experienced a WMSD in the first five years after graduation. This implies that physiotherapists first experienced a WMSD at a young age. This finding is consistent with most similar studies (Adegoke et al 2008; Cromie et al 2000; Glover et al 2005 and Nkhata et al 2010). Younger physiotherapists tend to be prone to WMSD because of lack of experience, knowledge and skills and they tend to have a higher workload (Alrowayeh et al 2010). Younger physiotherapists may also be too embarrassed to ask for help (Rozenfeld et al 2010).

However in contrast, Campo et al (2008) found that WMSD were associated with increasing age and this could be because their study consisted of older participants with a mean age of 40.3 years in comparison to the current study whose mean age of participants was 34.5years.

5.4 AREAS OF BODY AFFECTED BY WMSD

The highest prevalence of WMSD in this study was found in the low back (79.3%). This finding is consistent with most similar studies done (Cromie et al 2000; Salik et al 2004; Glover et al 2005; Adegoke et al 2008; Nkhata et al 2010 and Rozenfeld et al 2010) whose prevalence of low back pain ranged from 44% to 80%. The high figure obtained in this current study can also be attributed to the risk factors physiotherapists in Zimbabwe feel are major predisposing factors to WMSD in particular, “lack of assistive devices”, such as hoists and “lifting or transferring dependent patients”. These risk factors increase the physical demand and efforts required from the physiotherapist and thus increase the risk of injury (Useh et al 2002). Heavy workloads, because of the stress and strain they expose this area to (Nkhata et al 2010) have also been implicated as a cause for low back pain (Centres for Disease Control and Prevention (CDC) 2013). Physiotherapists in this current study pointed out that heavy workloads were a major predisposing factor to injury for them.

The other prevalent WMSD in this study were found in the shoulder (54%), upper back (51.7%), thumbs (50.6%), neck (42.5%) and hands (41.4%). These areas have also been found to be prone to WMSD in similar studies (Nkhata et al 2010; Salik et al 2004 and Rozenfeld et al 2010) and they have also been implicated as common sites of WMSD (CDC 2013) because of the repeated muscle contractions and static loading that they are exposed to during performance of tasks (Useh et al 2002).

5.5 PERCEIVED CAUSES AND PREDISPOSING FACTORS

The major perceived cause and predisposing factor to WMSD in the current study was treating a large number of patients a day with 62.1% of participants implicating it. This is a reflection of the shortage of health care workers (physiotherapists included) in Zimbabwean hospitals where the staff that are employed are under the pressure of heavy workloads (Centre on Migration, Policy and Society Working (COMPAS) 2004). Useh et al (2002) also found treating a large number of patients a day as a major risk factor to WMSD and this implies that workloads for physiotherapists working in Zimbabwe have remained high since Useh et al’s (2002) study was done. Similarly, Adegoke et al (2008) and Nkhata et al (2010) also implicated treating a large number of patients a day as a major cause of WMSD in their studies and this could be because of the similarities in work setting of participants in all the studies.

Other major perceived causes and predisposing factors to WMSD found in the current study were performing the same task over and over (55.2%), lack of assistive devices for

the physiotherapist (54%), performing manual orthopaedic techniques (52.9%), malfunction of equipment (50.6%) and lifting or transferring dependent patients (49.4%). These findings were consistent with most similar studies done (Cromie et al 2000; Nkhata et al 2010; Nordin et al 2011 and Sharan et al 2012). According to Useh et al (2002), the nature of a physiotherapist's job constantly predisposes them to all these factors.

It is important to note that despite the similarities noted between the current study and others (Cromie et al 2000 and Useh et al 2002) on major perceived causes and predisposing factors to WMSD, these studies related these predisposing factors to WMSD in specific areas of the body. Thumb, hand and wrist pain were related to performing manual orthopaedic techniques while low back pain was related to lifting dependent patients.

Participants in the current study found inadequate training in injury prevention a minor risk factor to WMSD and this was a common finding in some studies (Cromie et al 2000; Nkhata et al 2010 and Rozenfeld et al 2010). This implies that physiotherapists feel that they are adequately equipped in their training on injury prevention but due to other problems for example, high work load and malfunctioning equipment they are put at risk of injury (Nordin et al 2011). Salik et al (2004) went on to emphasise that despite a physiotherapist's knowledge on injury prevention being adequate, the equipment found in some settings, such as treatment beds, is not ergonomic thus making it difficult for the physiotherapist to practice the ergonomic principles they have been trained in.

5.6 COPING MECHANISMS

The most common coping mechanism which was always used by participants in the current study was modifying the patient's/physiotherapist's position (61.4%). This was a similar finding to Adegoke et al (2008) and is likely because participants in both studies were exposed to the same work conditions such as treating a large number of patients in a day. It would also be easier to modify position (either physiotherapist or patient) than to call for help or reduce patient load.

Other common coping mechanisms used by participants in the current study were adjusting plinth/bed height and using a different part of the body to administer treatment techniques. These were similar coping mechanisms to those found in other studies, (Cromie et al 2000; Salik et al 2004; Adegoke et al 2008; Nkhata et al 2010 and Rozenfeld et al 2010).

Participants in the current study appeared to only “sometimes” use the coping mechanisms thought to reduce strain on their bodies. For example, participants sometimes got help to handle heavy patients and they only sometimes paused regularly to stretch and change posture. Cromie et al (2000) had similar findings of participants occasionally using these coping mechanisms. The occasional use of these mechanisms deemed useful in reducing injuries could be attributed to high workloads, time constraints and shortage of staff which may force physiotherapists to cope with demanding situations on their own. Other reasons could also be what Cromie et al (2002) described as the “culture of physiotherapy” which involves physiotherapists viewing themselves as caring, knowledgeable and having moral obligations to their patients which inclines them to ignore their well-being to benefit their patients. This “culture of physiotherapy” could also explain why the majority of participants in the current study “never” asked technicians to treat patients.

5.7 PERCEIVED IMPACT

The greatest impact that WMSD had on the work of physiotherapists in the current study was modifying their physiotherapy techniques. This was a similar finding to West et al (2001) and Adegoke et al (2008). The majority of participants in the current study also sought physiotherapy treatment for their WMSD and did not consult a doctor and this is likely because of their knowledge in the field of injuries that allowed them to self-treat or seek help from colleagues. The majority of participants also took on an exercise or posture programme as a result of WMSD. This is likely because exercise can be an effective way in reducing the severity and risk of WMSD (Cromie et al 2001).

Despite their WMSD, the majority of participants were neither considering leaving the profession nor considering retiring early and had not changed their duties. This was a similar finding to some studies where participants generally did not change their work habits as a result of WMSD (Cromie et al 2002; Useh et al 2002; Salik et al 2004; Adegoke et al 2008; Alrowayeh et al 2010 and Darragh et al 2009). The moral obligation that physiotherapists feel towards their patients is a likely reason for them to continue with their work (Cromie et al 2002). Alrowayeh et al (2010) also found that for physiotherapists working in government, as was the case with the majority of physiotherapists in the current study, there is less job flexibility for people to be able change work habits and they are forced to stay in an environment irrespective of the injuries they may have.

It is also interesting to note that although splinting and bracing have been found to be effective ways to reduce risk of WMSD particularly in the thumbs (Snodgrass et al 2002), the majority of participants in the current study did not do this even with a high reported

prevalence of WMSD in the thumbs. A reason for this could be the “culture of physiotherapy” which makes physiotherapists not want to appear vulnerable to injury (Cromie et al 2002).

It is also likely that this same “culture of physiotherapy” caused 50.6% of participants in the current study to take medication for their WMSD while continuing with their work.

5.8 CONCLUSION

The findings from the current study bear many similarities to other studies done of this nature. A conclusion that could be drawn from this is that physiotherapists the world-over face similar risks to WMSD and employ similar coping mechanisms to try and deal with them. The impact of WMSD on the work of physiotherapists in this current study also appears to be the same as seen in other similar studies.

It can therefore be postulated that the status quo of WMSD in Zimbabwe bears many similarities to that of the world-over.

CHAPTER 6

6. CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

This chapter gives conclusions and recommendations for the physiotherapist and future research from this study whose aim was to establish the prevalence and nature of WMSD amongst physiotherapists in Zimbabwe and the coping mechanisms used to manage them. The limitations of this study are also acknowledged.

6.2 CONCLUSION

- There are more female (60.4%) than male (39.6%) physiotherapists practicing in Zimbabwe.

- Physiotherapists in Zimbabwe (30.7%) are mainly working in government and undertaking general physiotherapy practice.

- The career prevalence of WMSD amongst physiotherapists in Zimbabwe is high at 86.1%.

- The highest prevalence of WMSD is in the low back (79.3%) followed by the shoulder (54%), upper back (51.7%) and thumbs (50.6%).

- WMSD amongst Zimbabwean physiotherapists are mainly first experienced in the first five years after graduation.

- The major perceived cause and predisposing factor to WMSD amongst physiotherapists in Zimbabwe is “treating a large number of patients a day”. This is followed by “performing the same task over and over”, “lack of assistive devices and equipment” and “performing manual orthopaedic techniques”. “Inadequate training in injury prevention” is a minor perceived cause and predisposing factor to WMSD amongst Zimbabwean physiotherapists.

- The most common coping mechanism used by physiotherapists in Zimbabwe to reduce strain on their bodies when working is “modifying the patient’s/physiotherapist’s position”.

- Physiotherapists in Zimbabwe only “sometimes” use coping mechanisms thought to be effective in reducing strain on their bodies such as “getting help to handle heavy patients” and “stopping a treatment if it is aggravating any discomfort”.

- The greatest impact WMSD has on the work of physiotherapists in Zimbabwe is “modifying their physiotherapy techniques”. This is followed by “seeking physiotherapy treatment” and “taking on an exercise or posture programme”.

- Despite the high career prevalence of WMSD amongst Zimbabwean physiotherapists, they are neither changing their duties nor considering leaving the profession or retiring early.

6.3 LIMITATIONS OF STUDY

There were some limitations of this study which are acknowledged below:

1. This study’s design called upon participants to recall a career prevalence of WMSD which created a recall bias because information collected was based solely on participants’ memory of events in their career. It was assumed however, that these events when injuries occurred had such a significant impact on participants’ careers that they would recall the most important factors associated with them and thus reduce the bias.

2. The definition of WMSD used in this study was broad ‘any pain/discomfort/injury arising from ones work as a physiotherapist in their career’. However, it was assumed that because of the participants being physiotherapists and experts in injuries, they would be better able to differentiate the causes and sources of injury.

3. The number of “no response” could have been limited in the questionnaire if a “not applicable” section could have been added to each question because not all questions for example in the “perceived causes and predisposing factors” section (see Section 3: Appendix 5 applied to all participants. Adegoke et al (2008) and Cromie et al (2000) also encountered this problem and Cromie et al (2000) acknowledged that not all questions would be relevant to all participants.

6.4 RECOMMENDATIONS

6.4.1 Recommendations for Physiotherapists

1. Risk assessment and control of WMSD must be on-going in Zimbabwean health institutions to help minimize them and their effects amongst physiotherapists while patients continue to benefit maximally from physiotherapy.

2. Physiotherapists in Zimbabwe must engage in fora where issues of WMSD are discussed particularly where older more experienced physiotherapists advise younger colleagues on coping mechanisms and ideas are shared.

3. There must be on-going health promotion initiatives amongst physiotherapists in Zimbabwe which also involve possible reduction in patient load.

6.4.2 Recommendations for Future Research

1. Research must be conducted to investigate the effects of WMSD on the lives of physiotherapists outside of their work.

2. Research must be conducted on the psychological impact of WMSD on physiotherapists work and lives.

3. Research must be conducted to investigate the prevalence of WMSD amongst physiotherapists over time.

REFERENCES

Adegoke B, Akodu A, Oyeyemi A. Work-related musculoskeletal disorders among Nigerian physiotherapists. Biomedical Central Musculoskeletal Disorders. 2008; 9:112

Alrowayeh H, Alshatti T, Aljadi S, Fares M, Alshamire M, Alwazan S. Prevalence, characteristics, and impacts of work-related musculoskeletal disorders: A survey among physical therapists in the State of Kuwait. Biomedical Central Musculoskeletal Disorders. 2010; 11:116

Campo M, Weiser S, Koenig KL, Nordin M. Work-related musculoskeletal disorders in physical therapists: A prospective cohort study. Physical Therapy. 2008; 88:608–619

Canadian Centre for Occupational Health and Safety. (2002). Available at http://www.ccoh.ca/oshanswers/diseases/rmirsi.html. (January 2014)

Centres for Disease Control and Prevention. (2013). Available at www.cdc.gov/workplacehealthpromotion/implementation/topics/disorders.html. (January 2014)

Centre on Migration, Policy and Society Working. (2004). Available at https://www.compas.ox.ac.uk/fileadmin/files/Publications/working_papers. (February 2015)

Crawford J. The Nordic musculoskeletal questionnaire. Occupational Medicine. 2007; 57:300-301

Cromie J, Robertson V, Best M. Work related musculoskeletal disorders in physical therapists: Prevalence, severity, risks and responses. Physical Therapy. 2000; 80:336-351

Cromie JE, Robertson VJ, Best MO. Occupational health and safety in physiotherapy: Guidelines for practice. Australian Journal of Physiotherapy. 2001; 47:43-51

Cromie J, Robertson V, Best M. Work-related musculoskeletal disorders and the culture of physical therapy. Physical Therapy. 2002; 82:459-472.

Darragh AR, Huddleston W, King P. Work-related musculoskeletal injuries and disorders among occupational and physical therapists. American Journal of Occupational Therapy. 2009; 63:351-362.

Glover W. Work-related strain injuries in physiotherapists: Prevalence and prevention of musculoskeletal disorders. Physiotherapy. 2002; 6:364-372

Glover W, Mcgregor A, Sullivan C, Hague J. Work-related musculoskeletal disorders affecting members of the Chartered Society of Physiotherapy. Journal of Physiotherapy. 2005; 91:138-147

Graham L, Gray H. Recently qualified physiotherapists' perceptions of work related musculoskeletal disorders. International Journal of Therapy and Rehabilitation. 2005; 12(7):299-307

King P, Huddleston W, Darragh A. Work related musculoskeletal disorders and injuries: Differences among older and younger occupational and physical therapists. Journal of Occupational Rehabilitation. 2009; 19:274-283

Lee H, Ahn H, Park CG, Kim SJ, Moon SH. Psychosocial factors and work-related musculoskeletal disorders among Southeastern Asian female workers living in Korea. Safety and Health at Work. 2011; 2(2):183-193

McMahon M, Stiller K, Trott P. The prevalence of thumb problems in Australian physiotherapists is high: an observational study. Australian Journal of Physiotherapy. 2006; 52(6):287-292

Nkhata L, Zyaambo C, Nzala S, Siziya S. Work-related Musculoskeletal Disorders: prevalence, contributing factors and coping strategies among Physiotherapy personnel in Lusaka, Kitwe and Ndola districts, Zambia. Medical journal of Zambia. 2010; 37(4):262-267

Nordin N, Leonard J, Thye N. Work related injuries among physiotherapists in public hospitals-a South East Asian picture. Clinics. 2011; 66(3):373-378

Odebiyi D. Gender distribution of physiotherapy graduates from Nigerian universities. Journal of the Nigerian society of physiotherapy. 2005; 15(2):45-47

Passier L, Mc Phail S. Work related musculoskeletal disorders amongst therapists in physically demanding roles: Qualitative analysis of risk factors and strategies for prevention. Biomedical Central Musculoskeletal Disorders. 2011; 12: 12-24

Punnett L, Wegman D.H. Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. Journal of Electromyography and Kinesiology. 2004; 14:13-23

Queensland Health. (2010). Available at http://qheps.health.qld.gov.au/ahwac/content/reentry.htm (January 2014)

Rozenfeld V, Ribak J, Danziger J, Tsamir J, Carmeli E. Prevalence, risk factors and preventive strategies in work-related musculoskeletal disorders among Israeli Physical Therapists. Physiotherapy. Research. International. 2010; 15:176–184

Salik Y, Özcan A. Work-related musculoskeletal disorders : A survey of physical therapists in Izmir-Turkey. Biomedical Central Musculoskeletal disorders. 2004; 5:27-34

Sharan D, Ajeesh P.S. Injury prevention in physiotherapists- A scientific review. Work. 2012; 41:1855-1859

Snodgrass S, Rivett D. Thumb pain in physiotherapists: Potential risk factors and proposed prevention strategies. Journal of Manual and Manipulative Therapy. 2002; 10(4):206-217

Useh U, Igumbor E.U, Madzivire D.M. Occupational injuries among physiotherapists: A case study in Zimbabwe. African Safety Promotion. 2002; 1(2):26-33

West D. J, Gardner D. Occupational injuries of physiotherapists in North and Central Queensland. Australian Journal of Physiotherapy. 2001; 47:179-186

World Health Organization. (2003). Available at http://www.who.int/occupationalhealth/publication/en. (January 2014)

World Health Organization. (2007). Available at http://www.who.int/hrh/documents/countinghealthworkers. (January 2014)

World Health Organization. (2013). Available at http://www.who.int/countries/zwe/en. (January 2014)

APPENDIX 1

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M140411

NAME: (Principal Investigator)	Ms Chido Carol Pfumojena
DEPARTMENT:	Physiotherapy Zimbabwe
PROJECT TITLE:	The Prevalence of Work Related Musculoskeletal Disorders amongst Physiotherapists in Zimbabwe
DATE CONSIDERED:	25/04/2014
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Dr Med Maleka and Mrs V Naidoo

APPROVED BY: Professor PE Cleaton-Jones, Chairperson, HREC (Medical)

DATE OF APPROVAL: 12/05/2014

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Secretary in Room 10004, 10th floor, Senate University.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned r and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to s**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX 2

ALL CORRESPONDENCE SHOULD BE ADDRESSED TO THE REGISTRAR

c/o Parirenyatwa Psychiatric Hospital
The Annex, Cnr.
Josiah Tongogara Ave/Mazowe Street
Belgravia
Harare

Telephone: (263) (04) 797 500
Fax (263) (04)705 986

P O Box A 667
Avondale
Harare
Zimbabwe

E-mail: mrczimbabwe@gmail.com

MEDICAL REHABILITATION PRACTITIONERS COUNCIL ZIMBABWE

13 May 2014

Miss C Pfumojena
University of the Witwatersrand
Department of Physiotherapy
Johannesburg
South Africa

Dear Madam

RE: REQUEST FOR PERMISSION TO CONDUCT A STUDY

In response to your request for carrying out a study on "The prevalence and nature of work related musculoskeletal disorders amongst physiotherapists in Zimbabwe," the Medical Rehabilitation Practitioners Council of Zimbabwe is hereby granting you permission to conduct the study using physiotherapists registered under this Council as participants.

Yours sincerely

Chidavaenzi

Chidavaenzi D. (Mrs)
REGISTRAR

MEDICAL REHABILITATION COUNCIL ZIMBABWE
15 MAY 2014
PO BOX A 667
AVONDALE HARARE

APPENDIX 3

INFORMATION TO PARTICIPANTS-MAIN STUDY

Study title: The prevalence and nature of work related musculoskeletal disorders amongst physiotherapists in Zimbabwe.

Dear Participant

My name is Chido C. Pfumojena and I am a Masters in Physiotherapy student at the University of the Witwatersrand doing a research on, "**The prevalence and nature of work related musculoskeletal disorders (WMSD) amongst physiotherapists in Zimbabwe."** In this study I aim to determine the prevalence and nature of work related musculoskeletal disorders amongst physiotherapists in Zimbabwe so as to determine risk factors and thus develop methods of best practice resulting in suitable modifications, risk reduction and most importantly better service delivery to the patient in physiotherapy practice. This will also add to the body of knowledge on the prevalence of WMSD amongst physiotherapists.

I am kindly asking you to participate in this research study. Below, I have given a brief description of the study.

Participation in this study would involve filling in a questionnaire consisting of 5 sections. Section 1 will be demographic data; section 2 will look at prevalence; section 3- perceived causes and predisposing factors; section 4- coping mechanisms and section 5- perceived impact of work related musculoskeletal disorders on the work of physiotherapists. Filling in this questionnaire is likely to take up 10-15minutes of your time.

Risks: There are no risks involved in participating in this study.

Benefits: There are no monetary benefits for participating in this study. However, participating in this study will aid in developing methods of best practice in physiotherapy and thus improve service delivery to the patient.
The results of this study will be made available via publication and on request.

Participation is voluntary: Refusal to participate will involve no penalty and you are free to choose to discontinue participation at any time without penalty.

Confidentiality: Information that you will give shall be handled with strict confidence. You are not required to provide any identifying information on the questionnaire.

Contact details of researcher – For further information, please do not hesitate to contact me, my contact detail are as follows:

Miss Chido C Pfumojena
Department of Physiotherapy
School of Therapeutic Sciences
University of the Witwatersrand
Email: chidopfumojena@gmail.com/physiodissertation@gmail.com
Phone: +263 773041498

Thank you for your participation.

APPENDIX 4

INFORMATION TO PARTICIPANTS-PILOT STUDY

Study title: The prevalence and nature of work related musculoskeletal disorders amongst physiotherapists in Zimbabwe.

Dear Participant

My name is Chido C. Pfumojena and I am a Masters of Physiotherapy student at the University of the Witwatersrand doing a research on, "**The prevalence and nature of work related musculoskeletal disorders (WMSD) amongst physiotherapists in Zimbabwe."** In this study I aim to determine the prevalence and nature of work related musculoskeletal disorders amongst physiotherapists in Zimbabwe so as to determine risk factors and thus develop methods of best practice resulting in suitable modifications, risk reduction and most importantly better service delivery to the patient in physiotherapy practice. This will also add to the body of knowledge on the prevalence of WMSD amongst physiotherapists.

You are kindly asked to participate in the pilot study which will assist in conducting the above mentioned main study

Participation in this pilot study would involve filling in a questionnaire consisting of 5 sections. Section 1 will be demographic data; section 2 will look at prevalence; section 3- perceived causes and predisposing factors; section 4- coping mechanisms and section 5- perceived impact of work related musculoskeletal disorders on the work of physiotherapists. This questionnaire is likely to take up 10-15 minutes of your time. You will be requested to complete this same questionnaire again a week from today.

Risks: There are no risks involved in participating in this pilot study.

Benefits: There are no monetary benefits for participating in this pilot study. However, participating in this pilot study will aid in conducting the main study.

Participation is voluntary: Refusal to participate will involve no penalty and you are free to choose to discontinue participation at any time without penalty.

Confidentiality: Information that you will give shall be handled with strict confidence. You are not required to provide any identifying information on the questionnaire.

Contact details of researcher – For further information, please do not hesitate to contact me, my contact detail are as follows:

Miss Chido C Pfumojena

Department of Physiotherapy

School of Therapeutic Sciences

University of the Witwatersrand

Email: chidopfumojena@gmail.com/physiodissertation@gmail.com

Phone: +263 773041498

APPENDIX 5

QUESTIONNAIRE

The prevalence and nature of work-related musculoskeletal disorders (WMSD) amongst physiotherapists in Zimbabwe are not very well documented. You are kindly requested to answer the following questions either by filling the blank or by putting a cross, tick or asterisk next to or in the appropriate box. **Please note that by completing and returning this form to the researcher, you have consented to participate in this study.** You may be in doubt as to how to answer, but please do your best all the same.

SECTION 1: GENERAL INFORMATION

1. Age? _____years

2. What is your gender?
   ☐ Male ☐ Female

3. What is your qualification?
   ☐ Diploma in Physiotherapy
   ☐ Bachelor in Physiotherapy
   ☐ Masters in Physiotherapy
   ☐ Doctorate in Physiotherapy

4. How long have you been working as a physiotherapist? _____years

5. What is your current employment?
   ☐ Private practitioner (practice owner)
   ☐ Government
   ☐ Both private and government
   ☐ Academia
   ☐ Private practitioner (employed in a practice)
   ☐ Other (please specify)…….

6. Which area of physiotherapy practice does your current work involve?
   ☐ Neurology ☐ Sport ☐ Orthopaedics
   ☐ General practice ☐ Academia ☐ Paediatrics
   ☐ Other (please specify)……

7. What is your current work status?

☐ Full time ☐ Part time

☐ Other (please specify)……..

8. How many hours a week do you work? _____hours

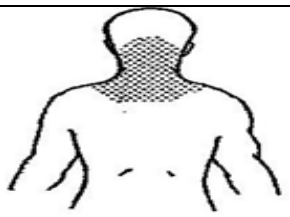
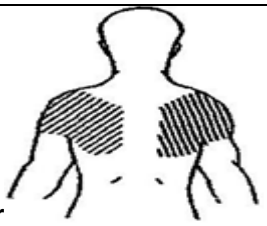
SECTION 2: PREVALENCE AND AREA OF PAIN

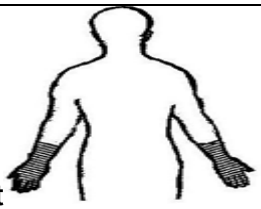
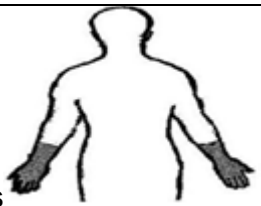
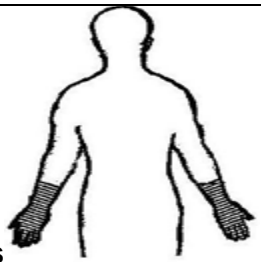
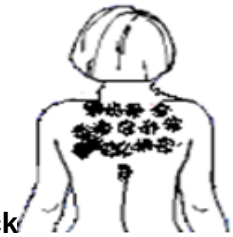
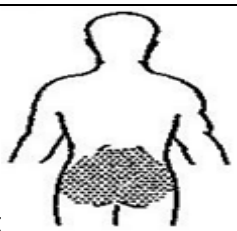
Note well: Please do not include any pain or injury you acquired outside of your work as a physiotherapist

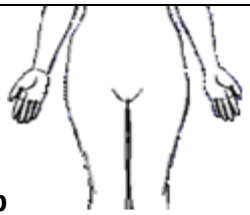
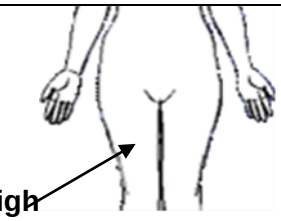
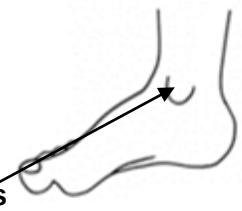
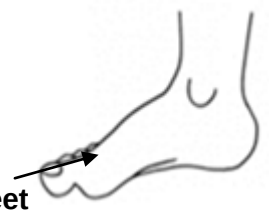
1. Have you ever experienced any pain/discomfort/injury arising from your work as a physiotherapist?

☐ Yes ☐ No

If you have answered 'yes' to the question above please specify below which areas you have experienced the pain or discomfort by ticking/putting a cross/asterisk in the boxes that apply to you. If you have answered 'no' please proceed to the next section.

	Yes	**No**
Neck 		
Headache		
Shoulder 		

Chest		
Forearms 		
Wrist 	**Yes**	**No**
Hands 		
Thumbs 		
Elbows 		
Upper back 		
Low back 		

 **Hip**		
 **Thigh**	**Yes**	**No**
 **Knees**		
 **Ankles**		
 **Feet**		

When did you first experience this work-related pain/injury/discomfort?

☐ - In the first 5 years after graduation

☐ - 6-15 years after graduation

☐ - >15 years after graduation

☐ - I have never experienced any work related musculoskeletal pain or discomfort

SECTION 3: PERCEIVED CAUSES AND PREDISPOSING FACTORS

This list describes factors that could contribute to work related musculoskeletal disorders amongst physiotherapists. In your opinion, to what extent have these factors contributed to your work related musculoskeletal disorder? (Please tick what is applicable to you or please move to the next section if you have never suffered from any work related musculoskeletal disorder)

Note well: Please don't include any pain/discomfort/injury acquired outside your work as a physiotherapist

No	Risk Factors	Major	Moderate	Minor
1	Performing the same task over and over			
2	Treating a large number of patients in one day			
3	Not enough rest breaks during the day			
4	Performing manual orthopaedic techniques (joint or soft tissue mobilization)			
5	Working in awkward or cramped positions			
6	Working in the same position for long periods			
7	Bending or twisting your back in an awkward way.			
8	Reaching or working away from your body			
9	Unanticipated sudden movements or falls by patient			
10	Assisting patient during gait activities			
11	Lifting or transferring dependent patients			
12	Working with confused or agitated patients			
13	Carrying, lifting or moving heavy materials or equipment			
14	Working at or near your physical limits			
15	Continuing to work when injured or hurt.			
16	Work scheduling (over time, irregular shift, length of workday)			
17	Inadequate training in injury prevention.			
18	Lack of assistive devices and equipment eg hoists			
19	Malfunction of equipment eg beds that cannot be adjusted			

Please state any other factors (not mentioned above) that you feel could contribute to work related musculoskeletal disorders for a physiotherapist.

……

……

……

SECTION 4: COPING MECHANISMS

The responses to the following statements should reflect what you **actually do in practice rather than what you would like to do or think you should do.**

In order to reduce the strain on my body when working:

No	Strategies	Always	Sometimes	Never
1	I get someone else to help me handle a heavy patient			
2	I modify patient's position/ my position			
3	I use a different part of my body to administer a manual technique			
4	I warm up and stretch before performing a technique.			
5	I use electrotherapy more often to avoid stressing an injury			
6	I pause regularly so I can stretch and change posture.			
7	I adjust plinth/bed height before treating a patient.			
8	I select techniques that will not aggravate or provoke my discomfort.			
9	I stop a treatment if it causes or aggravates my discomfort			
10	I ask a technician to treat a patient			

Please state any other coping mechanisms you use in practice to reduce strain on your body when working.

……

……

……

SECTION 5: PERCEIVED IMPACT

What do you view/what do you feel have been the consequences of your work related musculoskeletal pain/discomfort/injury on your work as a physiotherapist?

Note well: If you have not suffered from any work related musculoskeletal disorder, you do not have to answer this section.

No	Impact	Yes	No
1	Modifying your physiotherapy techniques		
2	Seeking physiotherapy treatment		
3	Consulting a doctor		
4	Changing your duties		
5	Changing your work setting		
6	Decreasing patient contact hours		
7	Taking time off on sick leave		
8	Using braces, splints or other orthoses		
9	Taking on an exercise or posture programme		
10	Considering leaving the physiotherapy profession		
11	Considering retiring early		
12	Taking medication		

THE END

THANK YOU FOR YOUR PARTICIPATION

APPENDIX 6 –PERMISSION FROM AUTHOR 1

COPY OF E-MAIL

Dear Chido Pfumojena,

Thank you for your email regarding your research. I am happy to agree for you to use our questionnaire in your study, but I do not know how to contact my co-author; you may need to contact her via other networks.

I hope your research goes well!

Best regards,

Dianne Gardner.

APPENDIX 7- PERMISSION FROM AUTHOR 2

From: Hesham Alrowayeh hrowayeh@hsc.edu.kw
Date: 10/26/14
To: me

Dear Mr. Pfumojena,

You have my permission to use the picture and if you need any help in the future please don't hesitate to ask.

Regards

Hesham N. Alrowayeh, P.T., Ph.D.
Kuwait University
Faculty of Allied Health Sciences- Physical Therapy Department
P.O.Box: 31470
Sulaibekhat, 90805
State of Kuwait
Telephone: (965) 2498-3501
Telefax: (965) 2498-3841

APPENDIX 8- RECOMMENDATIONS FROM PANEL OF EXPERTS

Question	Changes made
Section 1/ question 5-differentiate 'private practitioner'	Differentiated to 'private practitioner-practice owner' and 'private practitioner-employed in practice'
Section 2/ heading- add word 'area' to heading	Heading changed to 'prevalence and area of pain'
Section 2/ question 1- add forearms, headaches, separate wrist and hands and ankle and foot	Forearms, headaches added. Ankle and foot separated. Wrists and hands separated.
Section 3- add 'malfunction of equipment'	Malfunction of equipment added
Section 4- add a question on asking a technician to treat a patient	Question added- 'I ask a technician to treat a patient'

APPENDIX 9- QUALIFICATIONS OF PANEL OF EXPERTS

Name	Qualifications	Years of experience
Ms Annalie Basson	MSC PHYSIOTHERAPY	34
Dr Benita Olivier	PHD	12
Dr Ronel Roos	PHD	19
Ms Anelenie Smit	MSC PHYSIOTHERAPY	35+