THE EFFECT OF OCCUPATIONAL-RELATED LOW BACK PAIN ON FUNCTIONAL ACTIVITIES AMONG MALE MANUAL WORKERS IN A CONSTRUCTION COMPANY IN CAPE TOWN, SOUTH AFRICA.

BY

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A mini-thesis submitted in partial fulfilment of the requirements for the degree of Masters in Physiotherapy in the Department of Physiotherapy, Faculty of Community and Health Sciences, University of the Western Cape.

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November, 2010

KEYWORDS

Cape Town

Construction Manual Workers

Disability

Function

Low Back Pain

Musculoskeletal conditions

Occupational Related Low Back Pain

Occupational Risk Factors

Prevalence

South Africa.

ABSTRACT

Construction manual workers are at a high risk of suffering from occupational related low back pain because of high-risk activities involved and the nomadic nature of the workforce. Low back pain and its associated disability continue to plague the construction industry. The prevalence of occupational related low back pain among manual workers in construction companies is believed to be due to high exposure to awkward postures for long hours, heavy manual work and exposure to whole-body vibration in the work environment. As a result of these risky exposures, low back pain has consistently been the leading cause of both occupational disability and absenteeism in the construction industry. The purpose of this study was to determine the effect of occupational-related low back pain on the functional activities of the manual workers in a construction company in Cape Town. The prevalence and the predisposing factors of low back pain among construction manual workers were established as well as the effect of occupational-related low back pain on the functional activities of the manual workers was also determined. A cross-sectional descriptive study using quantitative method was utilized. A convenient sampling method was employed and all the 212 available participants at two construction settings were recruited for the study. The population was categorised into four main occupational groups; masons, handymen, labourers and foremen. Data was collected using a structured questionnaire as a closed ended interview guide. The questionnaire comprised of four parts. Part one was used to determine the demographic data while parts two, three and four utilised three standardized close-ended validated questionnaires. These are; the Nordic Musculoskeletal Disorder Questionnaire, the Profile Fitness Mapping questionnaire and the Pain and Disability Questionnaire. Data was captured and analyzed using the statistical package for social sciences (SPSS) version 17.0 spreadsheet for statistical analysis. The study was conducted under the adherence of the ethical considerations. Descriptive and inferential statistical analyses describe the association between the investigated independent variables with the occurrence of occupational related low back pain in the study. Results are presented using tables, charts and graphs. The results revealed a 25% prevalence of low back pain while the one month and one week prevalence rates were 69% and 54% respectively. Masons recorded the highest low back pain prevalence rate (58%). Initial onset of low back pain was mainly attributed to bending (48%) and load lifting (28%). The chi-square test at $p < 0.05$ was done. The results revealed a lack of association between low back pain and the socio-demographic characteristics. Participants confirmed suffering physical, emotional, financial and functional problems with 41.5% reporting sickness absence and a mean of 4 days being lost during the past year. Further chi-square test for proportion revealed an association between low back pain and participants' ability to; lift ($p=0.006$), bend back forwards ($p=0.001$) and ability to bend back backwards ($p=0.014$). To prevent impairment, activity limitation and participation restriction among construction manual workers, a number of factors must be addressed at epidemiological level as highlighted in the recommendations of this study.

DECLARATION

I hereby declare that: "**The effect of occupational-related low back pain on functional activities among manual workers in a construction company in Cape Town, South Africa,**" is my own work, that it has not been submitted, or part of it, for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references.

Signature: ....

Simon Himalowa

November, 2010

Witness: ....

Prof. José Frantz

DEDICATION

This thesis is dedicated to the almighty God for his divine love, goodness and faithfulness all the days of my life. **With him, all things are possible** (Matthew 19: 26).

To mum and dad, the esteemed support, care, love, mentoring and encouragement you've offered throughout my life. I deeply thank you for being there for me.

To my uncle **Kingsley Kabisa Nasando** to whom I'll always be grateful for having given me the opportunity to advance my career. The seed you planted in me has sprouted into this achievement. It's our achievement together.

ACKNOWLEDGEMENTS

To Grinaker Construction Company especially the human resource management and more particularly the role played by Mrs Charlene Wheeler. Thank you so much for granting me permission to conduct this study.

Special thanks and appreciation to my supervisor, Prof. José Frantz for her commitment, patience, guidance and constant support throughout this study. Without you, this study would not have been accomplished.

To Ms. Farhana Karachi, I'm deeply indebted to your guidance and contribution towards the initial stages of this study and to the rest of the University of the Western Cape Physiotherapy staff for their academic, administrative and social support.

I highly appreciate the statistical input and guidance of Abu Elgasim Ahmed Atta-Almanan Osman and Hamisi Hamisi. My deepest appreciation to my research assistant Abdul Aziz Jardine for being there throughout data collection.

Sincere thanks to the site managers and participants at Grinaker Construction Company for their time and assistance in this study.

To my brothers, Chiboola, Nawa, Christopher and my sisters, Ing'utu, Mary, Joan and Felistus, all my cousins, aunties and uncles, I thank you for your continuous support and encouragement.

To my friend Carolene Kituku, for the continuous encouragement, academic and all kind of support rendered to me during my study. I truly appreciate.

My sincere gratitude and appreciation to all my classmates Wallace, Lela and Anne and to all my colleagues at Library Knowledge Commons and to all friends for the academic, social, moral and spiritual motivation and support throughout the two years of my study. Thank you for your prayers.

MAY THE FELLOWSHIP OF THE HOLY SPIRIT AND LOVE OF THE ALMIGHTY GOD BE WITH YOU ALL.

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ACRONYMS AND ABBREVIATIONS

AIDS: Acquired Immune Deficiency Syndrome

BMI: Body Mass Index

HIV: Human Immune Virus

ICF: International Classification of Function

KG: Kilogram

PR: Prevalence Ratio

SD: Standard Deviation

SPSS: Statistical Package for Social Sciences

UK: United Kingdom

USA: United States of America

WHO: World Health Organisation

CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION TO THE CHAPTER

This chapter presents the background of the study, the statement of the problem, the aim of the study, the objectives, the explanation of significance of the study, the definition of terms, and the summary of chapters.

1.2 BACKGROUND

The health of Africa is of global concern, as improvement in health outcomes observed in most Western countries over the past few decades hasn't been achieved in Africa (Lopez, Mather, Ezzati, Jamison & Murray, 2001). This has been attributed to the more negative impact of HIV and AIDS pandemic replacing both the focus shift of health interventions and directions in health (Lopez et al., 2001). The global prevalence of general disability is highest in Sub-Saharan Africa (Murray & Lopez, 1997), which accounts for about 14% of the world's population, and it is also the poorest continent, bearing about 40% of the global burden of disease (Lopez et al., 2001). These researchers further stated that musculoskeletal disorders account for 4.3% of disability life adjusted years in the developed world, whilst it is reported as accounting for approximately 1% in the developing world. The aetiology of disability is multi-factorial and varies between different parts of the world (Murray & Lopez, 1997). Pain and loss of function associated with musculoskeletal conditions primarily leads to disability (Woolf & Pfleger 2003).

The four major musculoskeletal conditions leading to disability include osteoarthritis, rheumatoid arthritis, osteoporosis and low back pain (Woolf & Pfleger, 2003), with low back pain being the most prevalent musculoskeletal condition and one of the leading causes of disability in the developed world (Louw, Morris & Sommers, 2007). Louw et al. (2007: pg6) defined low back pain as "muscle tension, or stiffness, localised below the costal margin and above the inferior gluteal folds, with or without leg pain." Low back pain may result in significant levels of disability, producing restrictions on usual activity and participation, such as inability to work (Katz, 2006).

The economic societal and public health effects of low back pain appear to be increasing. Jones and Kumar (2001) highlighted that some industries require 50-180 tons of material be moved to produce one ton of marketable product, hence it is not difficult to accept that back injuries have become among the most expensive work-related maladies in industrialized countries. Low back pain incurs billions of dollars in medical expenditures each year (Childs, Fritz, Flynn, Irgang, Johnson, Majkowski & Delitto, 2004) and this economic burden is of particular concern in African states like South Africa where the already restricted health care funds are directed towards epidemics like HIV/AIDS (Lopez et al., 2001). Due to the major impact of low back pain on functioning in both daily living and work, measuring disability in construction manual workers suffering from occupational related low back pain is best described in terms of limitations in activities and restrictions in participation in daily living and work. The International Classification of Function, Disability and Health (ICF) is a universally accepted conceptual model established by the World Health Organisation (WHO) and used in clinical research to highlight the impact of diseases or conditions like low back pain on normal functioning, disability and health (Rauch, Cieza & Stucki, 2008).

A construction manual worker is a general/blue collar worker employed in the construction industry and works predominantly on construction sites and is typically engaged in hands-on aspects of the industry other than design or finance. This includes members of specialist trades such as builders, electricians, carpenters and plumbers (Reese & Eidson, 2006). There are an estimated 500 000 construction manual workers in South Africa in the formal and informal sectors (Deacon, Smallwood & Haupt, 2005). The major employees are construction builders with 126 000 employees (Statistics of South Africa 2005: pg5001). Construction has a reputation for being an unhealthy industry because its rate of work-related illness such as low back pain is one of the highest across all occupational groups (Deacon et al., 2005). Health problems among construction manual workers are relevant because of the number of high-risk activities involved in the everyday activities and the nomadic nature of the workforce (Deacon et al., 2005). Many construction manual workers may suffer from low back pain but do not report it as an injury. Nonetheless, such "non-reported" pain may also result in decreases of both productivity and quality and may lead to increased safety-related risks (Gallagher, 2008).

Deacon et al. (2005: pg173) emphasized the importance of 'occupational health' and defined it as "the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations." Occupational health is vital in reducing occupational related musculoskeletal injuries precisely in construction companies where the lower back is exposed to tremendous strain. Low back pain tends to affect the social, economical, physical and mental wellbeing of the person. It is hence important to determine the effect of occupational-related low back pain on the functional activities of the manual workers in a construction company in Cape Town.

1.3 PROBLEM STATEMENT

Construction work has a reputation of being an unhealthy industry because of the high mechanical nature and hard physical labour involved. However, little is known about the effect of occupational-related low back pain on the functional activities of the manual workers in a construction company in Cape Town.

1.4 RATIONALE FOR STUDY

The rationale for this study is to explore and describe the effect of occupational-related low back pain on the functional activities of the manual workers in a construction company in Cape Town. The results of the study may be a challenge to health professionals especially physiotherapists for future strategic approaches in primary and secondary prevention of occupational related low back pain among construction manual workers. It will also add value to the scanty literature available.

1.5 RESEARCH QUESTION

What is the effect of occupational-related low back pain on the functional activities of manual workers in a construction company in Cape Town?

1.6 AIM OF THE STUDY

To determine the effect of occupational-related low back pain on the functional activities of the manual workers in a construction company in Cape Town.

1.7 OBJECTIVES OF THE STUDY

- To determine the prevalence of occupational related low back pain among manual workers in a construction company in Cape Town, South Africa.
- To determine the risk factors of occupational-related low back pain among the manual workers in a construction company in Cape Town.
- To understand the association of occupational-related low back pain and the functional activities of the manual workers in the construction company.

1.8 DEFINITION OF TERMS

Low back pain: muscle tension, or stiffness, localised below the costal margin and above the inferior gluteal folds, with or without leg pain (Louw, Morris & Sommers, 2007).

Occupational related low back pain: is the low back pain that is caused, contributed by or significantly aggravated (for a pre-existing low back pain) by the events or exposures in the work environment (Bureau of Labour Statistics, 2007).

Musculoskeletal condition: healthy problems affecting muscles, nerves, spinal disc, joints, cartilage, tendons, and ligaments (Vines, 2001).

Construction manual worker: is a general/blue collar worker employed in the construction industry and works predominantly on construction sites and is typically engaged in hands-on aspects of the industry other than design or finance (Reese & Eidson, 2006).

Risk factor: A risk factor is a variable associated with an increased risk of disease, disorder, or infection (Gallagher, 2008).

Disability: is an umbrella term for impairments, activity limitations and participation restrictions. Denoting the negative aspects of the interaction between an individual with a health condition and this individual's contextual factors (environmental and personal factors) (WHO, 2001).

Function: the capability by an individual to perform an activity of daily life (Bjorklund, Hamberg, Heiden & Barnekow-Bergkvisk, 2007).

Prevalence: is the total number of people in a defined population who have back pain or a specific condition at a point in time (Loney & Stratford, 1999).

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The literature review presents an overview of the worldwide prevalence of work-related low back pain among construction manual workers, the occupational risk factors to low back pain in construction manual workers and the effect of occupational-related low back pain on functional activities of the manual workers.

2.2 WORLDWIDE PREVALENCE OF LOW BACK PAIN

The prevalent cases of occupational related low back pain accounted for 60% of all occupational diseases from 1990 to 2000 (Van Vuuren, Van Heerden, Zinzen, Becker & Meeusen, 2006). Deyo, Mirza and Martin (2006) established that about one fourth of the adults in the United States of America reported to have suffered from low back pain before, and that the prevalence generally declined with greater levels of education and increase in income. An Australian study by Kent and Keating (2005) reported 42.6% of the study population experiencing low back pain with 10.5% experiencing high activity limitations. A similar study done among Saskatchewan adults revealed that low back pain was a common problem in the general population, with approximately 11% of the studied population being disabled by the low back pain problem (Cassidy, Carroll & Côté, 1998). In Malaysia, the prevalence of low back pain among primary school teachers was 40.4% with teachers having a poor mental health status reporting a higher risk of developing low back pain and lifting being the main cause for low back pain (Samad, Abdullah, Moin, Tamrin & Hashim, 2010).

Low back pain cuts across gender, race and occupational environment (Igumbor, Useh & Madzivire, 2003). However, it has been established to be more common among construction manual workers compared to all occupational groups (Deacon et al., 2005). A British study by Latza, Pfahlberg and Gefeller (2002c) uncovered that the one year cumulative incidence of low back pain was 40% for construction workers as compared with 28% for managers. Deacon et al. (2005) reported that in the construction industry in the United States of America, the back was the body part mostly affected in comparison to all other body parts injured. Arndt, Rothenbacher, Daniel, Zschenderlein, Schuberth and Brenner (2005) highlighted that almost 20% of all work related injuries in Germany occur in the construction industry. These researchers state further that the Germany annual injury rate (non-fatal and fatal accidents) of 82 per 1000 construction workers is about 2.5 times the average rate of 34.5 per 1000 in all branches of industry. Musculoskeletal disorders especially low back pain make up a substantial part of non-fatal injuries and illnesses in construction work (Arndt et al., 2005). An epidemiological study among semi-skilled Danish construction workers showed that low back pain was a major health problem among these workers and that 65% of semi-skilled construction workers claimed a one-year prevalence of low back pain versus 53% of a reference group of warehouse workers (Damlund, Goth, Hasle & Munk, 1982a). In a group of early retired workers at the age of 60-65 years, it was reported that 68% of the semi-skilled construction workers had a one year prevalence of low back pain than the 50% in the control group (referents) (Damlund, Goth, Hasle & Munk 1982b). These researchers reported further that disability pensions were also found to be granted significantly more often to semi-skilled construction workers than to the referents because of diseases of the musculosketal system such as low back pain. Concrete reinforcement workers, who in Finland are a specialised group of construction manual workers, were found to have a life prevalence of 80% of low back pain (Damlund et al., 1982b). These researchers highlighted further that a correlation between physically demanding occupations and low back pain was found in a study of all occupations of the construction industry. Zwerling, Miller, Lynch and Torner (1996) found injury rates 4.6 times higher for construction workers compared to all other professions in their study of 7,798 injury cases in Iowa. Furthermore, these researchers found out that 25% of low back pain sufferers had lost in excess of 30 days from work. Holmstrom, Lindell and Moritz, (1992a, b) found that among the 1,773 construction workers studied, an annual prevalence rate of low back pain was 54%. Lipscomb, Dement, Loomis, Silverstein and Kalat (1997) found back strain injury rates 5.7 per 100 workers when assessing 10, 935 construction workers in Washington State. Guo, Tanaka, Halperin and Cameron (1999) evaluated data from over 30,000 respondents and found that construction labourers and carpenters had the highest prevalence of back pain within the construction industry. Among construction workers, back pain is at epidemic proportions in part due to ergonomic hazards (Bhattacharya, Greathouse, Warren, Li, Dimov, Applegate, Stinson & Lemasters, 1997; Schneider, Griffin & Chowhurry, 1998; Latza, Kohlmann, Deck & Raspe, 2000b).

In Africa, the lack of knowledge about the prevalence of low back pain is still significant (Louw et al., 2007). Some authors have suggested that the scarcity of reports from low-income countries like Africa may be due to the fact that low back pain pales in comparison with other health problems and therefore hardly seems worth mentioning (Deyo, 1997 as cited by Omokhodion & Sanya, 2003). A systematic review on the global prevalence of low back pain by Walker in the year 2000 identified that of the 56 included studies only 8% were conducted in developing countries, with only one study conducted in Africa. However, Louw et al. (2007) highlighted that the one year prevalence of low back pain among adolescents was 33% and 50% among adults in Africa. A study by Sikiru and Hanifa (2010) among nurses in a Nigerian hospital highlighted that the 12 month prevalence of low back pain was 73.53% and that low back pain was associated with occupational hazards and poor knowledge of back care ergonomics. Another study among commercial motor drivers and private automobile drivers in Nigeria established low back prevalence rates of 96% and 88% respectively, with prolonged sitting when driving being attributed to be the cause of the drivers' low back pain (Odebiyi, Ogwezi & Adegoke, 2007). The one year prevalence of low back pain among underground gold miners in Ghana was 67.2%, with a typical sickness absence record of 2-7 days and heavy physical work being identified as a major cause of low back pain (Bio, Sadhra, Jackson & Burge, 2007). Van Vuuren, Becker, Van Heerden, Zinzen and Meeusen (2005) found a low back pain point prevalence rate among South African steel plant workers of 35.8% with the lifetime prevalence rate being 63.9%. Another study by Van Vuuren et al. (2006) established the lifetime and annual prevalence of low back pain among workers in a South African manganese factory to be 71.6% and 69.8% respectively, with month and point prevalence being 55.0% and 37.6% respectively. In South African government hospitals in the Gauteng Province, a total number of 5 727 low back pain cases were seen by 152 physiotherapists between the 1st of January and the 30th of August 2006 (Naude, Mudzi, Mamabolo & Becker, 2009).

It is evident from the literature that the prevalence of low back pain in developed and developing countries is relatively high. However, various methodologies and definitions are used to report this prevalence. There is also a dearth of empirical studies and information reported on the prevalence of low back pain among construction workers in Africa.

2.3 OCCUPATIONAL RISK FACTORS OF LOW BACK PAIN

In Germany, Latza et al. (2002c) highlighted that work place factors such as maintenance of awkward postures for long hours contribute to the occurrence of low back pain disorders. If maximum contraction of a muscle is sustained, blood flow to that muscle decreases and because of the viscoelastic nature of collagenous tissue, sustained loads result in creep causing lengthening, functional instability and consequently occupational injury (Jones & Kumar, 2001). In construction industries, many factors predispose manual workers to low back pain. Activities undertaken by construction manual workers are in most cases strenuous and highly mechanical. These include repetitive trunk turning into flexion, extension, rotation, manipulation of heavy loads, heavy lifting that exceeds the lifting tolerance, forceful exertions and maintaining of awkward postures for long hours, these (factors) all lead to exertion of a lot of pressure on spinal structures (Punnett, Pruss-Ustün, Nelson, Fingerhut, Leigh, Tak & Phillips, 2005). These researchers reported further that insufficient healing time is another factor (Punnett et al., 2005). This can lead to repeated trauma on the lumbar spine and consequently low back pain. Mital (1997) highlighted that turning/twisting causes the structures supporting the spine to surrender up to 50% of their strength due to the nature of the anatomical structure of the annulus fibrosus which contains the disc. The intervertebral discs or more specifically, the annulus fibrosus or ligamentous structure containing the disc, is at risk when a twist is introduced into the motion of the back (Mital, 1997). Asymmetrical loads are also a high cause of low back pain injury in construction due to increased shear forces, and increased asymmetrical demand on the active and passive support structures of the spine. Whole body vibration (both segmental and whole body) is another risk factor that manual workers are exposed to during their work (Punnett et al., 2005). Regular exposure to whole-body vibration over many months or years can lead to injury to muscles, joints and bone structure not only of the back but the entire body (Archer, 2010). Archer (2010) reported further that vibration acting on the musculo-skeletal system of the body causes the degeneration of the small cartilage (intervertebral) discs, allowing tissues and nerves to be strained and pinched leading to various back problems. The longer one is exposed and the higher the level of whole-body vibration, the greater the chances of suffering a back injury (Punnett et al., 2005). The Hamburg Construction Worker Study by Latza, Karmaus, Sturmer, Steiner, Neth and Rehder (2000a) observed that most of the activities performed by workers for example bricklayers were carried out in a standing position (94.2%). Thus more than 50% of their work hours were spent in a bent position and that a bricklayer moved about 881 kilograms per hour (Latza et al., 2000a) with each brick weighing about 5-24 kilograms, depending on the type and size (Arndt, Rothenbacher, Daniel, Zschenderlein, Schuberth, Brenner, 2005). Deacon et al. (2005) indicated that, there was a relationship between the demonstration of low back pain symptoms to heavy work and vibration, exposures, frequent use of handheld tools, repetitive work, and awkward working positions. The study confirmed an association between stress and musculoskeletal disorders and low back pain (Deacon et al., 2005). Latza et al. (2000a) state that in Germany, disc-related diseases of the lumbar spine due to the long-term lifting or carrying of heavy loads or on account of long-term activities requiring extreme trunk flexion were added to the list of occupational diseases in 1993. This indicates that construction manual workers are at a high risk of developing occupational related low back pain as highlighted above.

In contrast, literature also reveals conflicting evidence for psychosocial risk factors associated with low back pain (Mazloum, Nozad & Kumashiro, 2006; Elders & Burdorf, 2001). A combination of low social support, low job control, high psychological demands, and high perceived work load may cause psychosocial job strain and increase the prevalence of low back pain (Elders & Burdorf, 2001). Despite literature recognising personal, psychosocial and lifestyle factors such as heredity, age, obesity, lack of physical exercises, smoking and strength of back and abdominal muscles to impact greatly on the risks of suffering from low back pain (Woolf & Pfleger, 2003; Thelin, Holmberg & Thelin, 2008), construction work still remains the leading cause of occupational related low back pain and constitutes a substantial proportion of permanent and temporary disability (Arndt et al., 2005).

As shown by literature (Arndt et al., 2005; Deacon et al., 2005), repetitive or static awkward body posture resulting from excessive bending (forward and lateral) and twisting (trunk rotation or torsion) will increase the spinal stress and asymmetrical loading to spinal structures. Work in forced extreme body posture can lead to temporally or chronic spinal defects and neurological compression syndromes (Mazloum et al., 2006). Therefore, occupational and individual risk factors should be included when determining factors contributing to the prevalence of low back pain among construction manual workers. This will provide information about specific individual and occupational risk factors related to various end points of low back pain in a population whose performance of heavy physical work is inevitable. Furthermore, any programs designed to reduce the impact of back injuries will first be sensitive to the occurrence of the causal event.

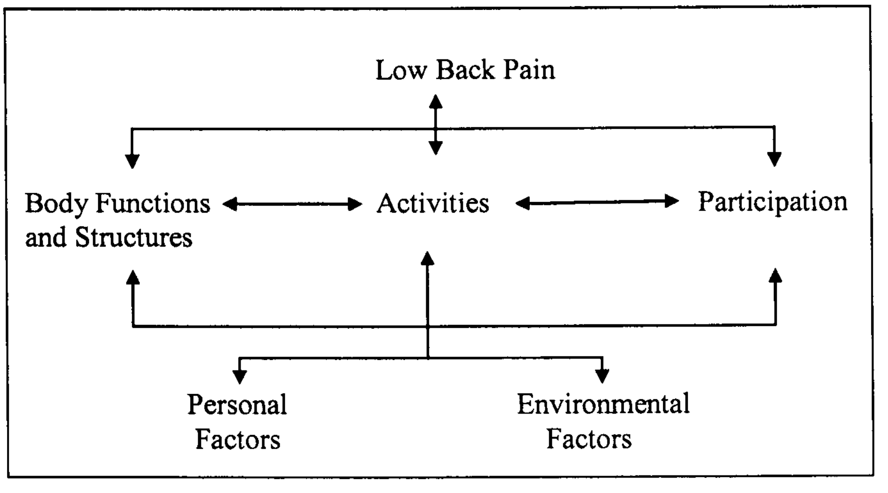
2.4 EFFECT OF OCCUPATIONAL-RELATED LOW BACK PAIN ON FUNCTIONAL ACTIVITIES

Bjorklund, Hamberg, Heiden and Barnekow-Bergkvisk (2007) defined functional limitations as activity limitations experienced because of the low back pain problems while activity limitation as the level of difficulty that an individual has in executing an activity due to low back pain. According to Punnett et al. (2005), occupational related low back pain is spread worldwide and has enormous effects on an individual's functional ability leading to the loss of one's quality of life. Construction activities exacerbate low back pain in construction workers and these activities lead to restrictions in daily activities such as standing, sitting, sleeping, walking, bending, lifting, carrying, travelling to work, socializing, interference with sex life and interference with personal care (Bjorklund et al., 2007). It has been noted that individuals with low back pain tend to have negative attitudes towards strenuous activities and leisure pursuits based on fear avoidance beliefs (Woolf & Pfleger, 2003). Anxiety, stress, depression, somatisation symptoms, stressful responsibility, job dissatisfaction, mental stress at work, negative body image, weakness in ego functioning, poor drive satisfaction and substance abuse were among the highlighted psychosocial factors associated with low back pain (Andersson, 1999).

Low back pain is the most common cause of early retirement on ground of ill health, sickness absence, job changes and a fall in the work speed among the working population (Sikiru & Hanifa, 2010). Punnett et al. (2005) indicated that worldwide, more people are disabled from working because of musculoskeletal disorders especially back pain than from any other group of diseases. Occupational related low back pain was estimated to cause 818,000 disability-adjusted life years lost annually worldwide (Punnett et al., 2005). About 70% of people with sick leave due to low back pain return to work within a week, and 90% return within two months and the longer the period of sick leave, the less likely one will return to work (MacIntosh & Hall, 2008). Andersson (1999) reported that most patients with back pain recover quickly and without residual functional loss and that overall, 60-70% recover by six weeks, 80-90% by 12 weeks and recovery after 12 weeks is slow and uncertain. Fewer than half of those individuals disabled for longer than six months return to work and, after two years of absence from work, the return-to-work rate is close to zero (Andersson, 1999). The high level of significant disability associated with low back pain should be a cause for concern among construction manual workers due to their high physical workload. Over 10% of Australian adult population had a high-disability low back pain problem, resulting in considerable time off from their usual activities (Walker, Muller & Grant, 2004). This has a negative effect on production as it reduces human resource. A British study by Hillman, Wright, Rajaratnam, Tennant and Chamberlain (1996) indicated that the number of days of certified incapacity due to low back pain has tripled to an estimated 106 million, and the number of patients with low back pain referred to hospital has increased fivefold at a total social cost to Britain of nearly six billion pounds in 1993, the cost of low back pain continues to rise by an estimated £500 million each year (Hillman et al., 1996). In the United Kingdom, lost productivity and resulting economic costs, due to low back pain were estimated to be in the region of 12 billion pounds in 1998 (Van Vuuren et al., 2006). The prevalence of low back pain in the United States, as well as the disability and financial burden associated with it, continues to increase with treatment costs such as physiotherapy and allied special services consistently rising by at least 7% per year in the United States, and they have a total impact in excess of $170 billion annually in health care (Pinto, Cleland, Palmer & Eberhar, 2007). In South Africa, it is calculated that about 30 000 persons suffer daily from back and neck problems and

10% of them will become functionally disabled with the compensation cost of approximately 20 million United States dollars in 2000 (Van Vuuren et al., 2006). Because of these costs, there has been renewed interest in identifying demographic, psychological, and socioeconomic variables that may contribute to low back pain chronicity and to treatment outcome (Anagnostis, Gatchel & Mayer, 2004). The International Classification of Function (ICF) with a more comprehensive bio-psycho-social description can be used to highlight the impact of low back pain on the person. This impact is illustrated in figure 2.1 below.

Fig 2.1: Model of Functioning and Disability (Steiner, Ryser, Huber, Uebelhart, Aeschlimann, & Stucki, 2002).



The international classification of function is a specially designed tool which provides a unified and standard language and framework for the description of all aspects of human health including low back pain and some health-relevant aspects of well-being (Steiner et al., 2002). The international classification of function comprises of components, of body functions, body structures, activities and participation, and it is further complemented by the components' of environmental and personal factors (Weigl, Cieza, Kostanjsek, Kirschneck & Stucki, 2006). The International Classification of Function Model of Functioning and Disability is a coherent view of various dimensions of health at biological, individual, and social levels (Steiner et al., 2002). This model represents a bio-psycho-social perspective best suited to cover all health problems including low back pain maladies especially among construction manual workers (Weigl et al., 2006). These low back pain maladies among construction manual workers are summarized according to the international classification of function under the umbrella term "functioning," whereas "disability" serves as an umbrella term for impairment, activity limitation, or participation restriction (Steiner et al., 2002). According to Weigl et al. (2006), a short version of the International Classification of Function, was tested for comprehensiveness by experts from three societies for physical medicine and rehabilitation of Germany, Austria and Switzerland and they did not identify any missing domains for the three examined indicator conditions-stroke, back pain and osteoporosis. This indicates that the International Classification of Function Checklist comprehensively covers the spectrum of problems encountered in patients suffering from low back pain and makes it the best suited tool to explain in detail the impact of occupational-related low back pain on the daily functional activities of the construction manual workers in the current study.

In Sub-Saharan Africa, the health systems are still more centered on fighting epidemics such as HIV/AIDS, Tuberculosis and Malaria (Lopez et al., 2001). Sykes (2008) reported that in developed countries, the focus of health systems is moving from diseases causing high death rates, such as communicable diseases, to chronic conditions (such as low back pain) that have lower mortality but higher impacts on the length of life lived with functional limitations. In developing countries, such as South Africa, the impact of chronic diseases such as low back pain is in addition to the continued need to respond to communicable diseases (Sykes, 2008). Therefore, highlighting of the impact of low back pain on the functional activities of the manual workers is critical in understanding the magnitude of the problem not only in South Africa but the entire African continent which is focusing on fighting other epidemics than low back pain. The use of the International Classification of Function model in this study endows a better understanding of the impact of low back pain on the daily functional status of the construction manual workers.

2.5 ROLE OF PHYSIOTHERAPY

Primary prevention should be considered a priority in the management of occupational related low back pain among construction manual workers. To enhance primary prevention of low back pain in work places, one must first be aware of the currently identified risk factors. Furthermore, understanding the development of work-related overexertion and repetitive strain injuries is dependent on a thorough understanding of tissue characteristics and physical performance. This is precisely the area of expertise of a physiotherapist. The physiotherapist brings to bear a significant knowledge of injury causation, the orthopaedic assessment skills needed to correctly diagnose the problem, and the treatment skills needed to return the worker to the job with minimal days lost (Jones & Kumar, 2001). Studies have found that physiotherapists have been cited far more often than the other health care professionals combined as the practitioners providing the best information about control of injury symptoms (Durant, Lord & Domholdt, 1989). The Physiotherapists' physiological understanding, the assessment, and the treatment skills results in a professional with the knowledge to direct an efficient preventative program for occupational related low back pain (Jones & Kumar, 2001). Physiotherapists must embark on work place disability management programs in their clinics when treating construction manual workers suffering from occupational related low back pain. The physiotherapist's role must include prevention, early assessment, proactive treatment, timely rehabilitation and early return to work in the hope of minimizing the cost of the low back problem and to reduce on the impairments, limitations in activity and restrictions in participation suffered by the construction manual workers as a result of low back pain (Jones & Kumar, 2001). "Commonly patients are released only after partial rehabilitation (barely functional for activities of daily living) and are not followed to their workplaces. Not philosophically but pragmatically it is emphasized the rehabilitation is incomplete unless the patient is reintegrated in the work force with or without adjustment and/or augmentation" (Jones & Kumar, 2001: pg 318). Physiotherapy intervention has been shown to have favourable outcome on pain management and sick leave among patients with low back pain, repetitive strain injuries and orthopaedic conditions (Durant et al. 1989). Physiotherapy rehabilitation of a worker should neither be partial nor delayed. Delay causes the worker to lose confidence in his or her ability to carry out those functional tasks required in their respective construction work situations. The longer these delays occur the more difficult it is to rehabilitate the patient (Zigenfus, Yin, Giang, & Fogartty, 2000). Low back pain and other musculoskeletal disorders among construction workers can be prevented and or be more effectively identified, diagnosed, and treated under the direction of a "physical ergonomist" or physiotherapist knowledgeable in the field of ergonomics.

Literature shows the consequent economic, psychosocial and functional challenges experienced by workers, employers and their families following the workers suffering from low back pain. Different occupational hazards seem to influence the prevalence of low back pain in various occupational settings. Therefore, identifying hazards to occupational-related low back pain is crucial to developing appropriate preventative and cost effective measures for low back pain (Bertazzi, 2000). This can further reduce the prevalence rates and impact of low back pain on the economic, psychosocial and disability (activity limitation & participation restriction) among construction manual workers. Hence, preventive measures must be put in place at epidemiological level and require implementation by the employer, health professionals (especially physiotherapists) and individual construction manual workers.

The purpose of this study was to determine the prevalence and the predisposing factors as well as to explore and describe the effect of living day-today with occupational-related low back pain and to document in detail how the pain impacts on daily activities of the construction manual workers.

2.6 SUMMARY

The chapter highlighted critical concerns regarding occupational-related low back pain among construction manual workers. The prevalence and occupational-related predisposing factors were described. The effect of low back pain on psychosocial and economic wellbeing of the individual manual worker, the family, society and employers was highlighted. A detailed account of the effect of occupational related low back pain on the daily functional activities of the construction manual workers was determined. However, the reviewed literature highlights the need for further studies to determine the effect of low back pain on the functional activities of construction manual workers. The next chapter describes the methodology of the study.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter describes the quantitative research method which was utilized in order to accomplish the objectives of the study. It gives a detailed description of each research approach through different sub headings under which the setting, design, population, sample size, data collection methods, research instruments, and data analysis are highlighted. The section finally ends by commenting on the ethical considerations of the study.

3.2 RESEARCH SETTING

The study was conducted at a construction company in Cape Town, South Africa. This construction company is among Africa's top construction companies and it is a multi-disciplinary construction and engineering group, anchored in South Africa and focused on selected infrastructure, energy and mining opportunities in Africa (www.grinaker-lta.com, 2009). At the time of the study, they were constructing a mammoth forensic science building in Plattekloof, a suburb situated north of Cape Town and a new police station in Milnerton which is a suburb in Cape Town situated on the Atlantic Ocean 11 kilometres to the north of Cape Town city's centre (www.milnerton.info, 2010). The two construction sites were selected as the settings for the study.

3.3 RESEARCH DESIGN

A descriptive cross-sectional quantitative method was utilized. This type of research is conducted to estimate the prevalence of the outcome of interest for a given population or a subgroup within the population with respect to a set of risk factors. In this way cross-sectional studies provide a 'snapshot' of the outcome and the characteristics associated with it, at a specific point in time (Levin, 2006). Furthermore, cross-sectional surveys are economical and manageable within a limited time framework (Polit, Beck & Hungler, 2001).

3.4 POPULATION AND SAMPLING

The study was conducted among all construction manual workers working at Plattekloof and Milnerton construction sites at the time of the study. The total number of manual workers at both construction sites was 212. Of the 212, 142 were based in Plattekloof and 70 were based in Milnerton. The workers included manual workers involved in physical and mechanical work such as bricklayers, plasterers, concrete mixers, painters, scaffolders, steel fixers and plumbers. A convenient sampling method was employed where all the available and willing participants were recruited for the study (De Vos, Strydom, Fouché & Delport, 2005). All the participants from the two construction sites were recruited for the study.

3.5 INCLUSION CRITERIA

All the male construction manual workers with at least three months working experience constructing the forensic science building in Plattekloof and a new police station in Milnerton were included in the study. Only male manual workers were included because there were no female manual workers on the two construction sites at the time of the survey.

3.6 EXCLUSION CRITERIA

All the workers who had worked for less than three months in the construction industry were ineligible to participate in this study. The screening question for work experience in the demographic part of the questionnaire was used for exclusion. However, all the workers had atleast a three months work experience, hence none was excluded from this study.

3.7 INSTRUMENT

Data was collected by means of questionnaire (Appendix F). The questionnaire (Appendix F) was used as a closed ended interview guide. It (Appendix F) comprised of four parts and took approximately 8 to 20 minutes to complete depending on whether one had low back pain or not as participants without low back pain did not need to fill in all the questions. The first part of the questionnaire (Appendix F) consisted of 11 questions comprised of demographic information. The demographic part sought information about gender, age, height, body weight, job description, type of worker, work experience, duration of work per day, the most common position adopted on duty, the average weight lifted per day. In this part, open-ended and closed-ended questions were phrased, with dichotomised answer alternatives 'yes' and 'no' being used for closed ended questions. The second part of the questionnaire consisted of 19 questions which determined data on low back pain perceived causes and symptoms as well as the history of low back pain in relation to the symptoms in the last 12 months. Information determining low back pain perceived causes and symptoms was derived from the Nordic Musculoskeletal Disorder Questionnaire (De Barros & Alexandre 2003) and the Profile Fitness Mapping questionnaire (Bjorklund et al., 2007). Closed-ended dichotomised response alternatives of either 'yes' or 'no' being used. This part recorded data on whether the worker experienced pain, stiffness, soreness, ache or discomfort in their lower back during the preceding 12 months. The response "yes" was used to determine the prevalence of occupational related low back pain among the construction manual workers in this study.

The third part of the questionnaire (Appendix F) was used to test functional limitation. It utilized the Profile fitness mapping questionnaire. The Profile Fitness Mapping questionnaire consists of two back-specific scales, designed for the assessment of self-estimated symptoms and functional limitations which can be classified according to the International Classification of Function (ICF) (Bjorklund et al., 2007). The main purpose of the functional limitation scale of the profile fitness mapping questionnaire was to assess how back problems affected the construction manual workers capability to perform an activity of daily life (Bjorklund et al., 2007). Twenty-seven elementary activities formed the basis for the functional limitation scale of the profile fitness mapping questionnaire. All items of the profile fitness mapping questionnaire have six response alternatives (ranging from 1 = very good, 2=good, 3= rather good, 4=rather bad, 5=bad to 6 = very bad. Higher index scores reflect better function/better health. The result of each index is expressed as the percentage of the maximum score, where 100% is the best possible result.

The fourth part of the questionnaire was used to test participation restriction. It utilized the Pain and Disability Questionnaire. It is a standardised comprehensive psychometric evaluation tool of functional status focusing primarily on disability and function (Anagnostis et al, 2004). The pain and disability questionnaire is made up of two factors: a Functional Status Component comprising a maximum of a 90 score and a Psychosocial Component comprising a maximum of a 60 score, yielding a total functional disability score ranging from 0 to 150 (Anagnostis et al., 2004).

The anthropometric measurements of height and weight were recorded and the BMI calculated. The height of the participants was measured using a tape measure while the body weight was checked using the bathroom scale. The BMI ratio was calculated using the formula; weight (kg) / height $(cm)^2$ (www.bmiformula.net).

3.7.1 Reliability

Reliability is the stability of the measuring tool in yielding similar results from the same population at different times (Monette, Sullivan & Dejong, 2002: pg117). The Nordic Musculoskeletal Disorder Questionnaire (used in determining the low back pain prevalence in the current study) has demonstrated reliability results with Kappa values ranging from 0.88 to 1, and it is said to be internationally validated and respected, having been used in the assessment of musculoskeletal symptoms worldwide (De Barros & Alexandre 2003). For internal consistence, the profile fitness mapping questionnaire varied between 0.90-0.95 on the Cronbach's alpha with all items having item-total correlations above 0.2, indicating the tool is highly reliable (Bjorklund et al., 2007). According to conventional rules, any coefficient exceeding 0.70 is regarded as high (Patel, Ekman, Spertus, Wasserman & Persson, 2008). The pain disability questionnaire is a reliable standardised tool with the test-retest reliability coefficients (ranging from 0.94 to 0.98) and a Cronbach's alpha coefficient of 0.96 for the pain and disability questionnaire were found to be of excellent quality. The responsiveness of the pain and disability questionnaire as measured by Cohen's effect size statistic, ranged from 0.85 to 1.07 (Anagnostics et al., 2004). All the three instruments utilised in the compilation of the questionnaire used in this study were hence reliable as shown in their reliability results.

3.7.2 Validity

Validity refers to the extent to which an empirical measure accurately reflects the concept it is intended to measure (Babbie, 2004: p143). The validity of the Nordic Musculoskeletal Disorder Questionnaire has been investigated and approved in different studies globally and in several languages including English, Persian and Portuguese (De Barros & Alexandre 2003). The correlations coefficient of the profile fitness mapping and the back-specific criterion questionnaires ranged between 0.61 and 0.83, indicating good criterion validity of the profile fitness mapping questionnaire (Bjorklund et al., 2007). The pain and disability questionnaire was observed to have a high level of face validity and construct-related validity was also found to be of excellent quality, as it correlated well to both the MVAS (0.65-0.81) (Anagnostis et al., 2004). The face and content validity of the instrument utilized in this study was reviewed by a peer group from the University of the Western Cape Physiotherapy department. The feedback from the reviewers was integrated to the questionnaire to improve the appropriateness, the quality of the questions, the format and scales used.

3.8 PILOTING

A pilot study was conducted to measure the appropriateness of the tool and the time taken to complete it, for better understanding and clarity, and to offer the researcher the opportunity of testing the effectiveness of the tool. According to De Vos (2002), the purpose of the pilot study is to improve the success and effectiveness of the investigation. The author states further that the suitability of the questionnaire should be considered the most valuable function of the pilot study as there is always the certainty of possible error and pre-testing the instrument is the surest protection against such errors. To avoid ambiguity of the questions and to ensure aptness and comprehensibility of the tool, it was pilot-tested on five construction workers renovating a building within the University of Western Cape campus. This provided feedback regarding the suitability, feasibility and overall presentation of the tool. Because an entirely different setting of the main study was used, subjects of the pilot study were automatically excluded from the main study hence ensuring avoidance of biased responses. The primary method of instrument presentation was through self administration. However, due to fear of a poor participation rate, the researcher and the assistant used the tool as a closed ended interview guide without any alterations of the piloted and validated tool.

The only challenge encountered during the pilot was nature of phrasing of a few questions which were not very clear to the participants. Alterations were then made to the questionnaire to clarify the questions before the main study commenced. The final questionnaire (Appendix F) had short and precise questions, easily understandable and the whole questionnaire/interview required approximately 15-20 minutes to complete.

3.9 PROCEDURE

The data collection process started after permission and ethical clearance (Appendix A) was obtained from the Higher Degrees Committee of the University of the Western Cape. Further permission to conduct the study was requested in writing (Appendix B) by the researcher from the human resource management of the construction company. This was accompanied with copies of the proposal, the ethical clearance letter (Appendix A) and the questionnaire (Appendix F). Written feedback was obtained from the human resource management of the construction company (Appendix C). A third year multi-lingual physiotherapy student with fluency in English, Afrikaans and Xhosa and an experience in clinical practice was trained for a week prior to data collection process to clarify the topic, aim, objectives, rationale, the ethics and the questionnaire of the study. Data collection commenced after permission (Appendix C) was granted by the human resource management of the construction company.

Data was collected using the questionnaire (Appendix F) as a closed ended interview guide. Informal permission was obtained from the site manager to approach the participants individually while on site. Participants were then conveniently selected and individually approached while on site by the principle researcher and the research assistant. The objectives and rationale of the study were explained to the willing participants verbally in English, Afrikaans or Xhosa, depending on which language the participant was comfortable with. Further explanation was available in writing through the information sheet (Appendix D). The participants were assured of freedom to withdraw from the study at anytime without repercussions. Confidentiality and anonymity of the information they gave were guaranteed and that no names would be referred and no one would be identified through the answering of the questionnaire. Participants were then voluntarily and conveniently asked to sign the consent form (Appendix E). The questionnaire (Appendix F) was used to direct the closed ended interview by systematically reading out the questions to the participant and filling in the answers as they were being given by ticking the correct option on the questionnaire (Appendix F). Where necessary, further explanation was done by the principal researcher and the research assistant respectively. The data collection process lasted for a week.

3.10 DATA ANALYSIS

All the data collected from the study was entered in a Statistical Package for Social Sciences (SPSS) version 17 spreadsheet for statistical analysis. The researcher performed data cleaning to ensure completeness and internal consistence by double checking the data, re-entering and then using frequencies to check for correct entry of the data. Descriptive statistical analyses were done to express the independent variables as frequencies and percentages. Inferential statistics were done to determine relationships between different variables.

3.10.1 Statistical analysis

Chi-square analyses were done to investigate the relationship between different independent variables with the prevalence of low back pain in the present study. The tested variables included; working hours per day, posture mainly adopted on duty, attributed cause of low back pain. The Pearson correlation coefficient was used to determine the association between low back pain and average weight manually lifted per day. However, the analyses were adjusted for the confounding effects of participants' age, height, weight, BMI ratio, job title and work experience. To determine the association between low back pain and its effect on the functional activities of the construction manual workers, the chi-square test for proportion was used where the six response alternatives for examining functional activity items were further dichotomised into 50% equal proportions of either 'good' or 'bad'. Descriptive statistics using the mode and mean were used to determine the extent of restriction in participation as a result of low back pain among the participants. The Data was summarized in terms of percentages and frequencies and presented in form of bar charts, graphs and tables. The 95% confidence intervals were estimated and all the results were significant at $P<0.05$ level.

3.11 ETHICAL CONSIDERATIONS

The study commenced after written permission and senate approval were granted by the Higher Degrees and Research Committee of the UWC. Further permission was obtained from the human resource management of the construction company to conduct the study. The objectives and rationale of the study were explained to the participants verbally and in writing through the information on the consent form. The form clearly explained the aim of the study as well as the benefits to the participants. Confidentiality and anonymity of the participants was maintained and assured throughout the study as they were not requested to mention their names or give out any form of identity. All participants who agreed to participate in the study were requested to sign the written informed consent form as proof of voluntary participation. Participants were assured of the right to withdraw from the study at any time they wished without prejudice or any repercussions by the researcher or employer during the time of the study.

3.12 SUMMARY

The chapter described the research setting, design and population and sampling method. The methodological approaches to data collection and the motivation for the choice of the methods were explained. The instrument used in data collection, procedures followed and data analyses were also described. The chapter ended with explanation on the ethical clearance procedures. The next chapter will focus on the findings of the study.

CHAPTER FOUR

RESULTS

4.1 INTRODUCTION

This chapter presents a descriptive overview of the quantitative findings of the study. These include the demographic information of the study participants, job profiles, the prevalence, duration and frequency of low back pain, information on the low back pain symptoms, functional limitations and participation restrictions among the participants. Statistical analysis was used to explore the relationship between different predisposing factors for low back pain among the participants. Descriptive and inferential statistical analysis were utilised and results are presented with the aid of tables and graphs.

4.2 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

All participants invited to participate in the study on the day agreed to participate, thus yielding a 100% response rate. The total number of participants amounted to 212. All 212 participants were male. The age of the participants ranged between 17 and 65 years with a mean age of 31.92 years (SD=10.68 years). The majority of the participants were in the age group less than 30 years (53.8%). The mean height of the participants was 171 cm (SD=7cm), with a range from 150cm – 199cm. The mean body weight of the participants was 71.06kg (SD=13.28kg), with a range from 44 kilograms to 122 kilograms. The body mass index (BMI) of the participants ranged from 12.6 - 47.7 kg/m^2 with the mean BMI of 24.26 kg/m^2 (SD=4.48 kg/m^2). Table 4.1 shows the social demographic characteristics of the participants.

Table 4.1: Socio-demographic characteristics of participants

Variables	Characteristics	Frequency	Percentage
Age group	30 years and less	114	53.8
	31-40 years	57	26.6
	41-50 years	24	11.3
	51 years and above	17	8.0
	Total	212	100.0
Height group (cm)	165 and less	54	25.5
	166-175	96	45.3
	176-185	58	27.4
	186 and above	4	1.9
	Total	212	100
Weight group (kg)	70 and less	123	58.0
	71-80	49	23.1
	81-90	22	10.4
	91 and above	18	8.5
	Total	212	100.0
BMI groups (kg/ m^2)	18.4 and less (Underweight)	10	4.7
	18.5-24.9 (Normal weight)	126	59.6
	25-29.9 (Overweight)	54	25.5
	30 and above (Obese)	22	10.4
	Total	212	100

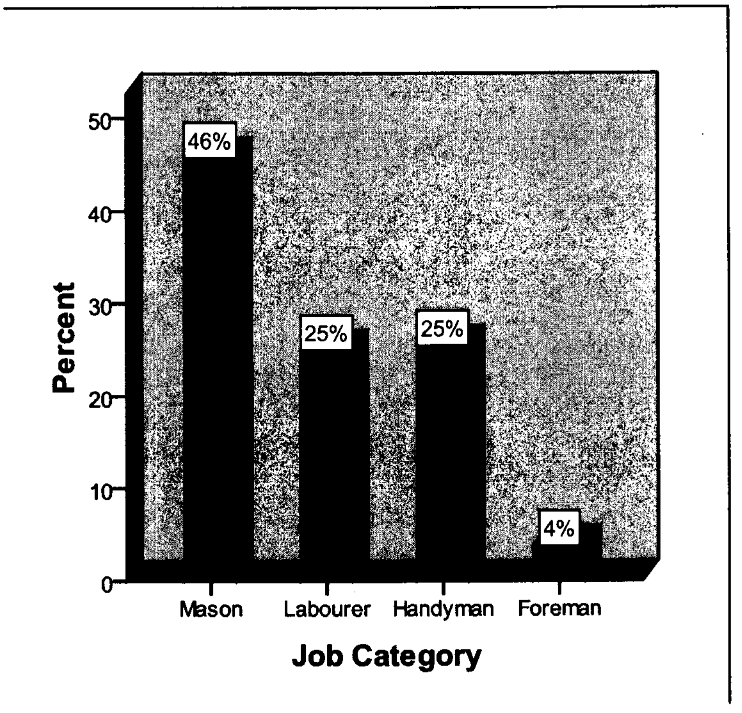
4.3. DISTRIBUTION OF BMI ACCORDING TO AGE CATEGORIES

The distribution of BMI according to age categories was examined. The results indicated that the highest (41%) levels of obesity were among participants above 50 years. Most participants (73.7%) below 30 years of age had a BMI between 18.5-24.9 kg/m^2 which was recorded as normal. The chi-square test was used to determine an association between BMI and age categories and the results showed a significant association between BMI and age categories ($p=0.000$) indicating that BMI increased with age.

4.4 JOB TITLES OF THE PARTICIPANTS

The participants' job titles were categorised into four groups with each group representing participants that performed similar work under similar working conditions. These were masonries, handymen, labourers/general workers and foremen. The majority of the participants from the population were masons (46%) who were directly involved with building and construction work. They comprised of plasterers, bricklayers, concrete mixers, aluminium fitters, ceiling fitters, crane operators, demolitionists, dumpers, fitters, glazers, joint sealers, machine operators, pavers, pipe fitters, pipe layers, roofers, scaffolders, scrappers, steal fixers, tilers and window fixers. Handymen and labourers both accounted for 25% of the population. The handymen comprised of air-conditioner installers, fire fighters, boiler makers, carpenters, electricians, lift installers, metal workers, painters, plumbers and welders. The labourers didn't have any speciality trade and were involved with general work. The fourth group comprised of foremen (4%) and were mainly involved in supervising and more technical work. Figure 4.1 illustrates job categories.

Fig 4.1: Job categories of the participants



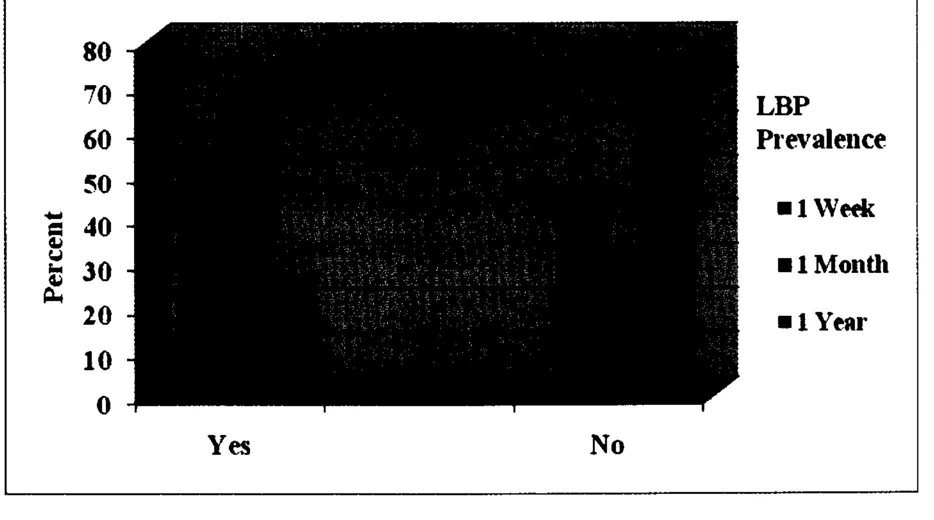
Most of the participants were employed as contract workers (59.9%). The work experience of the participants ranged between 0.25 years to 40 years with a mean work experience of 6.37 years (SD=8.06 years). The results indicate that the majority of the participants (n=70, 33%) had a work experience of between two to four years. The participants worked between 7 to 12 hours per day with the majority of them working for 8 hours a day. The mean for working time per day was 8.42 hours (SD=0.638 hours).

The participants frequently adopted different postures while performing their routine work. These included; bending (n=121, 57.1%), standing (n=70, 33%), stooping (n=13, 6%) and sitting (n=6, 3%). Different working postures such as squatting, twisting and rotation were collectively classified as 'other' and were the least positions adopted (n=2, 1%). No participant adopted the kneeling position while on duty (n=0, 0.0%). The approximated average weight manually lifted by the participants ranged between 2 kg to as much as 4 000 kg. The mean weight manually lifted by the participants being 123.48 kg (SD= 311.43 kg).

4.5 PREVALENCE OF LOW BACK PAIN

The one year prevalence of low back pain in the current study was 25 % (n=54), with the one month prevalence of low back pain among the participants 69% (n=37) and the one week prevalence was 54% (n=29). A high percentage of participants (94%) attributed the initial onset of their low back pain problem to construction work activities. Participants related their initial onset of low back problem to bending (48%), load lifting (28%), carrying (16%), prolonged sitting (2%) and adoption of a combination of different working positions (6%). Six percent could not vividly recall the exact activity that could have caused the low back pain but still related the onset to have been caused by the nature of construction work. Figure 4.2 below illustrates the prevalence of low back pain among the participants.

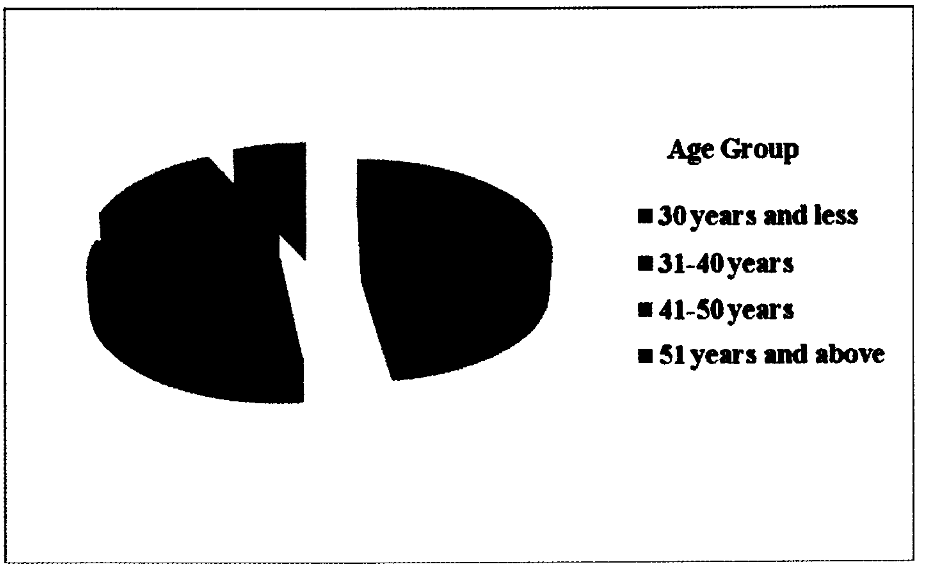
Fig 4.2: Prevalence of low back pain among the participants



4.5.1 Distribution of low back pain according to age

The study explored the distribution of low back pain according to different age categories. Four age groups were used and age-related low back pain frequency was examined. High ratios of low back pain (48%) were frequent among the youngest age group that were less than 30 years, while the least ratios (7%) were reported among the oldest age group of 51 years and above as shown in figure 4.3 below.

Fig 4.3: Distribution of low back pain according to age categories (n=54)



There was no significant association found between age and one year prevalence (p=0.69), one month prevalence (p=0.64) and one week prevalence (p=0.60) of low back pain.

4.5.2 Distribution of low back pain according to anthropometric measurements

4.5.2.1 Height

The distribution of low back pain among the participants according to the height categories was examined. Participants with a height between 176cm and 185cm reported the highest prevalence of low back pain (40.7%). This was followed by participants in the 166cm to 175cm who reported a 38.9 % prevalence of low back pain. Participants comprising the tallest group of 186cm and above did not record any problems with low back pain.

4.5.2.2 Weight

The prevalence of low back pain according to weight categories was examined. The prevalence of low back pain among four weight categories was found to be different from each other. A high frequency percentage was recorded among participants weighing 70kgs and less (57%), while the least percentage was recorded among the heaviest group weighing 91kgs and above (6%). The chi-square test was used to determine an association between low back pain and weight categories. The results showed that there was no significant association between low back pain and weight categories ($p=0.544$).

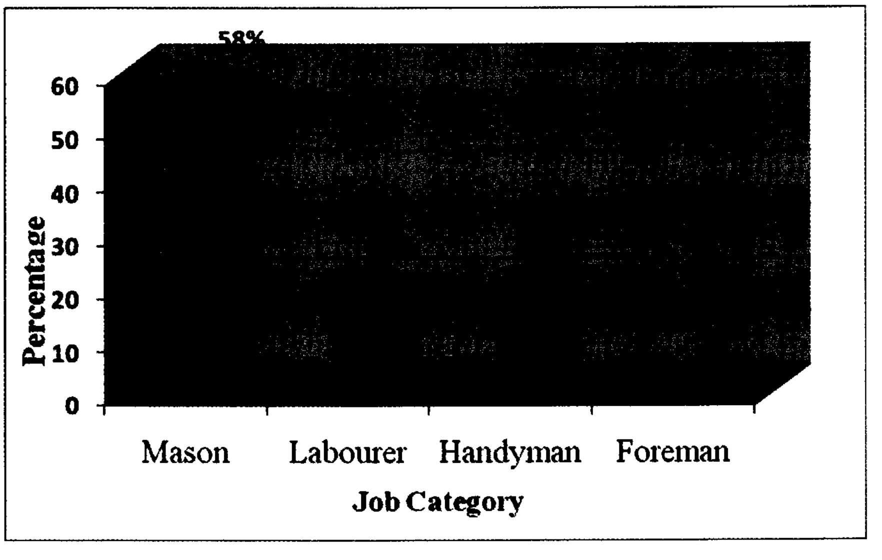
4.5.2.3 BMI

The low back pain distribution according to BMI was examined. High low back pain prevalence was recorded among participants with BMI of 18.5-24.9kg/m^2 (59%) followed by participants with a BMI of 25-29.9 kg/m² (28%). The chi square test results showed a lack of significant association between low back pain and BMI ($p=0.941$).

4.5.3 Distribution of low back pain according to job categories

Depicted in figure 4.4 below is the distribution of low back pain according to job categories. The results indicate that construction masonries were the worst affected (n=31, 58%), followed by labourers (n=11, 20 %) and handymen (n=11, 20%). Foremen were the least affected (n=1, 2%) with occupational related low back pain. The chi-square test was used to determine the association between low back pain and job categories. The chi square test results indicated a lack of significant association between job title and low back pain ($p=0.239$).

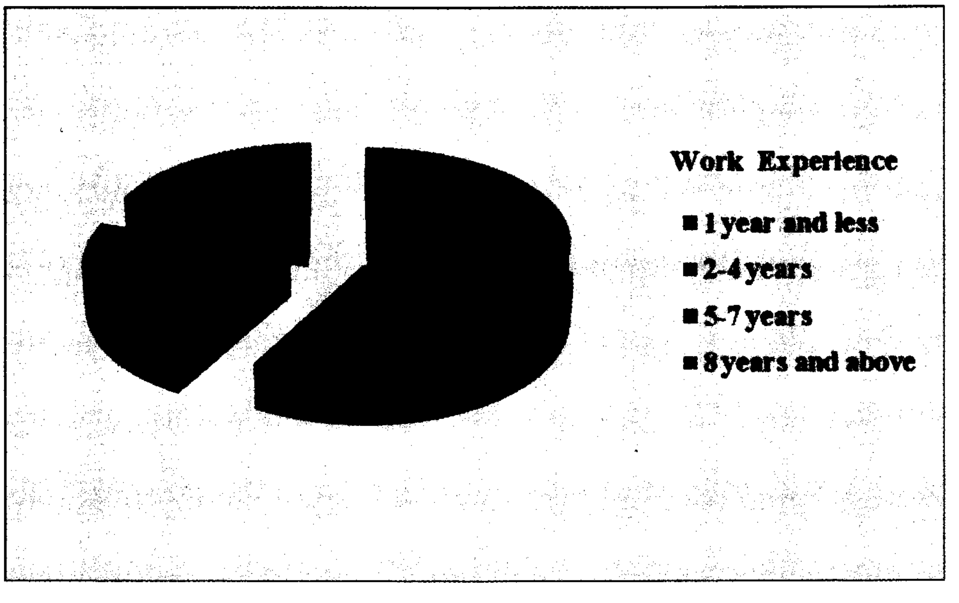
Fig 4.4: Distribution of low back pain according to job categories (n=54)



4.5.4 Distribution of low back pain according work experience categories

Figure 4.5 below illustrates the distribution of low back pain according to work experience. The number of participants suffering from low back pain in each work experience category was recorded. The results indicated that the highest prevalence of the 54 workers that suffered from low back pain, had between two to four years working experience (32%) and the least number (20%) was recorded among the most experienced participants that had worked for eight years and above. The results showed that there was no significant association between low back pain and work experience (p=0.864).

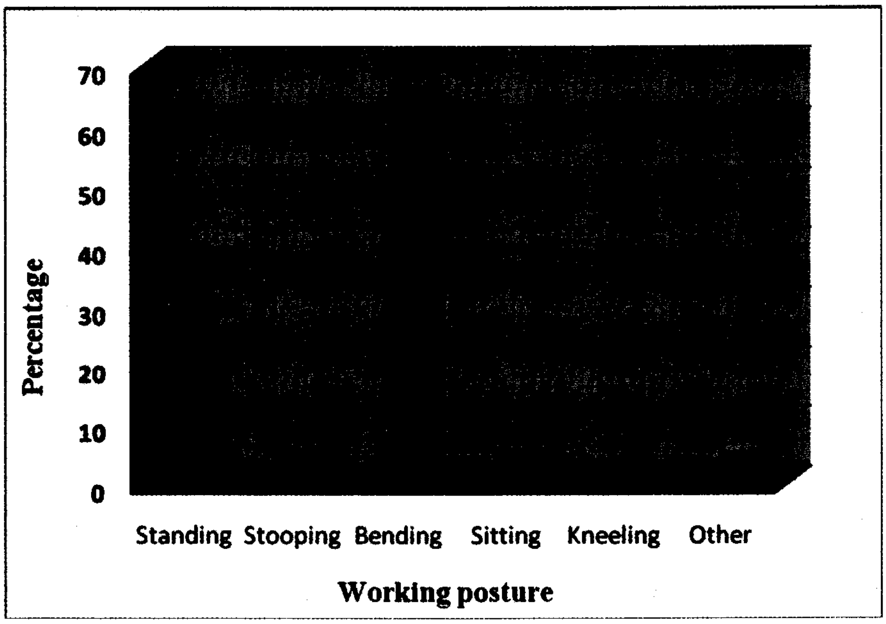
Fig 4.5: Distribution of low back pain according work experience (n=54)



4.5.5 Distribution of low back pain according working posture

The distribution of low back pain according to different working positions adopted by the workers on duty was examined. Participants that mostly worked in the bend posture reported to be the most affected with low back pain (64.8%) followed those that worked in the standing posture (24.1%) as illustrated in the figure 4.6 below. The chi-square test indicated a lack of significant association between low back pain and working posture (p=0.055).

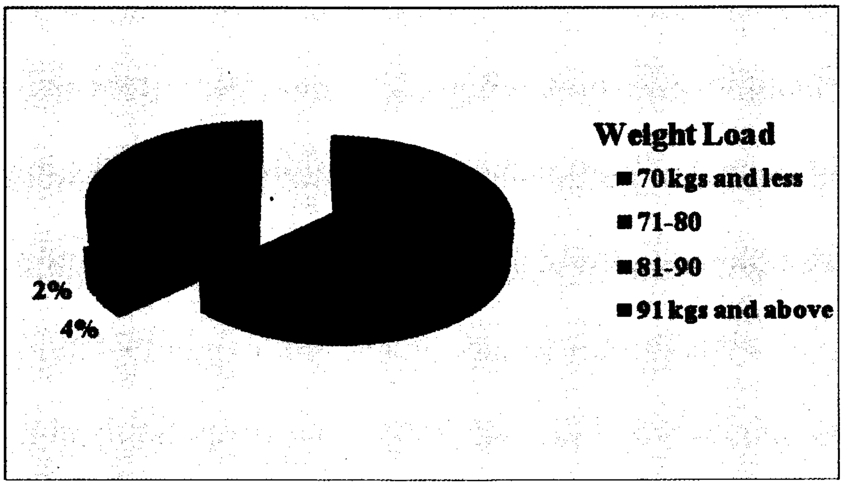
Fig. 4.6: Distribution of low back pain according working posture (n=54)



4.5.6 Distribution of low back pain according to load weight lifted per day

The distribution of low back pain according to weight load lifted per day was more prevalent among participants that lifted 70 kilograms and less (63%) and least prevalent among participants that lifted between 81 to 90 kilograms as shown in figure 4.7 below. There was a lack of significant correlation between low back pain and participants' weight lifted per day (r=0.005, p=0.943).

Fig 4.7: Distribution of low back pain according to load weight lifted per day (n=54)



4.6 ABSENTEEISM FROM WORK IN THE PAST YEAR DUE TO LOW BACK PAIN

There were 41.5% participants that had taken time off work in the past one year. The number of days taken off work ranged from one to fourteen days with an average of four days of absenteeism during the past year confirmed by the participants. Masons recorded the highest percentage (54.5%) of absenteeism followed by handymen (31.8%). Foremen recorded the least number of days (4.5%) of absenteeism. A high percentage (70%) of participants confirmed to have been prevented from carrying out activities at work because of their low back pain problem.

4.7 OTHER REPORTED SYMPTOMS ASSOCIATED WITH LOW BACK PAIN AMONG PARTICIPANTS

Participants confirmed that there were other symptoms they suffered from associated with their low back problem. These symptoms are highlighted in Table 4.3 below. The majority of the participants experienced high levels of irritability and short temperedness (56. 6%) as a result of suffering from occupational low back pain. A higher number of participants (67.9%) confirmed to be experiencing a lot of anxiety due to their low back pain problem. Most participants (87.7%) experienced low back pain during their activities while on duty and a relatively high number (54.7%) confirmed experiencing the problem at rest. The results also showed that most of the participants (58.5%) confirmed the low back problem to have affected their mood.

Table 4.2: Other reported symptoms associated with low back pain among participants

Physical Problems	**Symptom**	**Percent**
	Limping when walking	28.3%
	Disturbance of balance	24.5%
	Difficulty with urination	22%
	Difficulty with emptying bowel	18.9%
	Stomach problems	18.9%
Emotional problems	Irritable and short tempered	56.6%
	Anxiety	67.9%
	Mood	58.5%
Functional problems	Activities	87.7%
	Pain at rest	54.7%
	Sleep	58.5%
	Sex life	32.1%

4.8 THE EFFECT OF LOW BACK PAIN ON FUNCTIONAL ACTIVITIES OF THE PARTICIPANTS

Simple tasks comprising of 24 items were examined to determine the level of functional limitation at a personal level due to low back pain. The reason to this was the assumption, based on clinical observations, that limitations in simple activities often cause difficulties in more complex motor tasks, making the simple activities more valid for a general population of low back pain patients (Bjorklund et al., 2007). A summary of the limitations are reported in Table 4.3 below and activities indicating >50% on the bad side are more affected and highlighted below. The chi square test for proportion was used to test the association between low back pain and the effect of the pain on functional activities of the participants. The most affected functional activities include; running (56%, p=0.414), carrying (63%, p=0.057), lifting up objects (69%). The results indicated that there was a significant association between low back pain and its effect on the participants' ability to lift up objects (p=0.006). Putting on and taking off socks (54%, p=0.586), bending back forward (72%), the results revealed that there was a significant association between low back pain and its effect on the participants' ability to bend their backs forwards (p=0.001). Bending back backward (67%), the results showed a significant association between low back pain and the participants' ability to bend their backs backward (p=0.014). Side-bending back to the right (56%, p=0.414), side-bending back to the left (56%, p=0.414), turning back to the right (54%, 0.586), walking upstairs (56%, p=0.414), squatting down (63%, p=0.057), lifting up the right leg when lying down (61%, p=0.102), lifting the left leg when lying down (63%, p=0.057), lifting up the right leg while sitting (56%, p=0.414) and lifting up the left leg while sitting (54%, p=0.586).

Table 4.3: Functional limitation of the participants due to low back pain (n=54)

	Good		Bad		P-value
	Frequency	**Percent**	**Frequency**	**Percent**	
Stand	28	52%	26	48%	0.785
Walk	33	61%	21	39%	0.102
Sit	33	61%	21	39%	0.102
Lay down	35	65%	19	35%	0.029*
Run	24	44%	30	56%	0.414
Carry	20	37%	34	63%	0.057
Lift	17	31%	37	69%	0.006**
Throw	40	74%	14	26%	0.000**
Put on and take off a sweater	45	83%	9	17%	0.000**
Put on and take off socks	25	46%	29	54%	0.586
Bend your back forward	15	28%	39	72%	0.001**
Bend you back backward	18	33%	36	67%	0.014*
Side-bend your back to the right	24	44%	30	56%	0.414
Side-bend your back to the left	24	44%	30	56%	0.414
Turn your back to the right	25	46%	29	54%	0.586
Turn your back to the left	27	50%	27	50%	1.000
Walk upstairs	24	44%	30	56%	0.414
Walk downstairs	29	54%	25	46%	0.586
Squat down	20	37%	34	63%	0.057
Jump with both feet together	27	50%	27	50%	1.000
Lift your right leg when laying down	21	39%	33	61%	0.102
Lift your left leg when laying down	20	37%	34	63%	0.057
Lift your right leg, when sitting	24	44%	30	56%	0.414
Lift your left leg sitting	25	46%	29	54%	0.586
The condition of your work condition	40	74%	14	26%	0.000**
Your general health	51	94%	3	6%	0.000**
Your return to work return	41	76%	13	24%	0.000**

* P-value<0.05

**P-value<0.01

4.9 PARTICIPATION RESTRICTION DUE TO LOW BACK PAIN AMONG PARTICIPANTS

The levels of restriction in participation as a result of low back pain were examined. A scale ranging from 0 to 10 was used to determine the levels/severity of restriction in participation among the participants with low back pain. Zero meaning no effect and ten denoting severe effects. Activities recording a mode of more than five were regarded to have severe restrictions. The following functional activities recorded a mode of >5.

Interference of low back pain torwards the participants' normal work (mode=6), ability to lift overhead, grasp objects or reach for things (mode=4, 5 & 7), ability to lift objects off the floor, bend, stoop, or squat (mode=5 & 8) restrictions in walking or running (mode=7) income declining since low back pain began (mode=6 & 8) interference with recreational activities and hobbies (mode=10), need help from family and friends to complete everyday tasks (mode =6), feeling more depressed, tense and anxious than before the pain began (mode=5 & 7). Table 4.4 below highlights the details of restriction in participation due to low back pain among the participants.

Table 4.4: Participation restriction due to low back pain among participants (n=54)

Item	Mean	Mode
Interference with normal work	5.76	6
Interference with travelling to work	4.76	3
Affected ability to stand	4.87	5
Affected ability to lift overhead, grasp objects, or reach for things	5.58	4,5 & 7
Affected your ability to lift objects off the floor, bend, stoop, or squat	6.45	5 & 8
Affected ability to walk or run	6.42	7
Income declined since your pain began	6.05	6 & 8
Take pain medication every day to control pain at work	5.47	5
Forced to see doctors much more often than before pain began	6.03	5
Interfere with ability to see people who are important to you such as you would like	6.68	5
Interfere with recreational activities and hobbies	7.56	10
Need the help of family and friends to complete everyday tasks	5.97	6
Feel more depressed, tense, or anxious than before pain began	6.05	5 & 7
Emotional problems interfering with family, social & or work activities	5.20	3

4.10 SUMMARY OF RESULTS

In this chapter, the overview of the results of the study was presented. The one year prevalence of low back pain among construction manual workers was 25% while the one month and one week prevalence was 69% and 54% respectively. Initial onset of low back pain was mainly related to bending (48%) among other construction activities. The chi-square test at 95 % confidence interval revealed a lack of association between low back pain and the socio-demographic characteristics. The highest frequency of low back pain was observed in the age ≤ 30 (48%), medium height (40.7%), the least heavy group (57%) and BMI of 18.5-24.9kg/m^2 (59%). With occupational related factors, the highest prevalence of low back pain was recorded in masons (58%), participants with a work experience between 2-4 years (32%), participants who worked in bending posture (64.8%) and participants who manually lifted load ≤ 70kgs per day. Participants confirmed suffering physical, emotional, financial and functional problems with 41.5% reporting sickness absence and a mean of 4 days being lost during the past year due to low back pain. Problems among construction manual workers relative to functional limitations and participation restrictions were identified due to low back pain. Further chi-square test for proportion revealed an association between low back and participants' ability to lift (p=0.006), low back and participants' ability to bend their backs forwards (p=0.001) and between low back pain and participants' ability to bend their backs backwards (p=0.014). Descriptive statistics used to determine the extent of restriction in participation as a result of low back pain among the workers, showed that the workers could not participate in several activities as a result of occupational related low back pain. The following chapter discusses the findings of the study.

CHAPTER FIVE

DISCUSSION

5.1 INTRODUCTION

The aim of this study was to determine the effect of occupational-related low back pain on the functional activities of the manual workers in a construction company in Cape Town, South Africa. This chapter discusses the prevalence, risk factors and the effect of occupational-related low back pain among the manual workers in a construction company in Cape Town. The low back pain prevalence is determined at one week, one month and at one year. Prevalence is also determined in association with age categories, anthropometric measures, job categories, work experience categories, working posture and weight lifted per day. Other symptoms associated with low back pain are also taken into consideration. Disability as a result of low back pain is discussed as activity limitations and participation restriction in accordance with the results of the study. The chapter also compares the findings of the current study with that of published literature.

5.2 FINDINGS ON DEMOGRAPHIC CHARACTERISTICS

The response rate in this study was high (100%) compared to other responses in other studies (Elders & Burdorf, 2001; Latza et al., 2000a; Latza et al., 2002c; Ghaffari, Alipour, Jensen, Farshad & Vingard, 2006). The mean age of the construction manual workers was 31.92 years (SD=10.68 years). The results showed that the majority of workers were 30 years and below which is comparable with the two studies done in Germany among construction workers (Arndt et al., 2005; Latza et al., 2002c). Lots of difficulty was encountered in comparing the age and the mean age as there was a lot of variation in the recruitment age of the participants among different studies depending on the country where the study was done and the objectives of the study. The majority of the workers in this study were 30 years old and below (53.8%). This could be because of the higher levels of strength the young people possess as the nature of construction work demands high levels of physical strength. Considering gender and low back pain, all participants in this study were male as also reported in other literature (Arndt et al., 2005; Elders & Burdorf, 2001; Latza, et al., 2002c; Latza et al., 2000a; Deacon et al, 2005).

5.3 PREVALENCE OF LOW BACK PAIN

The one week prevalence of low back pain in this study was 54%. This recorded a higher one week low back pain prevalence than in previous studies among Iranian industrial workers and Danish semi skilled construction workers which recorded one week prevalence rates of 8.5% and 8% respectively (Ghaffari, Alipour, Jensen, Farshad & Vingard, 2006; Damlund et al., 1982a). The one month prevalence of low back pain in this study was 69%. This recorded a higher prevalence than a previous study among Danish semi skilled construction workers which recorded a one month low back pain prevalence of 28% (Damlund et al., 1982a). There is a need to note that studies tend to define prevalence rates differently, depending on whether the period under survey is 1 week, 3 months, 6 months, 12 months or a lifetime. However, the one year prevalence of low back pain in the present study was 25%. This revealed a lower prevalence compared to similar studies done among construction workers in Netherlands and Germany which reported prevalence rates of 85% and 30.9% respectively (Elders & Burdorf, 2001; Latza et al., 2000a). The one year prevalence of low back pain in this study was however higher than the 15.4% recorded among contruction workers in Germany (Latza et al., 2002c). The one year low back pain prevalence in this study was also higher than the two studies done among industrial workers in Iran which recorded prevalence rates of 17.6% and 21% respectively (Mazloum et al., 2006; Ghaffari et al., 2006). A study done in the USA among industrial workers established the highest prevalence of low back pain among construction workers at 23.9% which was lower than the prevalence of this study (Guo et al., 1999). However, caution must be exercised when comparing these studies, due to the differences in low back pain definitions and study methods and population (Ghaffari et al., 2006). Andersson (1999) highlighted that the annual prevalence of back pain ranges from 15% to 45%, depending on the population, time of the sampling, the sampling technique, and the actual questions asked, with point prevalence rates averaging 30%. Therefore, the prevalence of low back pain in this study is in accordance with the prevalence rates between 12% and 35% mentioned in literature (Quittan, 2002; Maniadakis & Gray, 2000; Scovron, Szalski, Nordin, Melot & Cucier, 1994; Helewa, Goldsmith, Smythe & Stitt, 2001). However, it is imperative that a common low back pain definition be used in research for a common understanding of prevalence and evaluation of interventions and management of the low back pain problem.

5.4 INDIVIDUAL RISK FACTORS FOR LOW BACK PAIN

Literature reports a variety of individual risk factors that are associated with low back pain. These factors include age, height, weight, BMI (obesity), physical strength, prior injury, back and abdominal muscle strength and pain intolerance (Woolf & Pfleger, 2003; Thelin, Holmberg & Thelin, 2008; Gallagher 2008). In the current study, individual factors that influenced the risk of occupational related low back pain were determined. These are; age, height, weight, BMI and work experience. These factors are highlighted below with regards to the findings of previous literature.

The Chi-square test indicated that there was no significant association (p=0.69) between age and low back pain. This reveals that there was no significant difference in age and in the occurrence of low back pain. This finding was in support with previous findings in various studies (Mazloum et al., 2006; Ghaffari et al., 2006). Although some literature reports low back pain to be mainly associated with ageing (Deacon et al., 2005), other reports show that low back pain occurs most often in those between the ages of 32 to 55 (Mazloum et al., 2006). The highest frequency of low back pain sufferers in this study was observed among the youngest age group '30 and below' while the frequency of low back pain was lowest among the oldest age group '51 years and above'. This finding could be attributed to the young's haste and hurry to do tough jobs and to carry heavy load (Mazloum et al., 2006), or it could be linked to the assumption that older workers are more likely to be more experienced and hence show a significantly lower risk of injury. Basing on this finding, it means younger construction workers may suffer from low back pain at a much higher rate than the older ones.

In the present study, there was no association between low back pain and the considered anthropometric measures. Participants with a height between 176cm and 185cm reported the highest prevalence of low back pain (40.7%), while the shortest groups, 175 cm and below, reported least prevalence rates of low back pain. This contradicts a study done in America which highlighted that weight and height appear not to be important regarding back disorders in occupational population (Johannig, 2000). However, the findings of this study were supported by previous literature which pointed out that height or stature of the employees was an important individual factor that poses a greater risk of low back pain (Schneider, 2001). The ability of carrying load steadily declines with increase in the height of the people, and tall people are more susceptible to low back pain than the others (Mazloum et al., 2006). The highest prevalence of low back pain was recorded among the workers weighing 70kgs and less (57%), while the least percentage was recorded among the heaviest group weighing 91kgs and above (6%). This is contrary to the findings of Mazloum et al. (2006) who highlighted that the body weight is an important factor to carry load. The researchers stated further that as the body weight increases, energy consumption and metabolism also increase. This means that in a similar job, individuals with heavier weight have to bear more stress physiologically because it causes fatigue and cardio-vascular problems (Mazloum et al., 2006). A high rate of low back pain prevalence was recorded among participants with a BMI of 18.5-24.9kg/m^2 (59%). This opposes previous literature which highlighted that obesity is associated with a greater risk of low back pain (Pope & magnusson, 2002; Deacon et al., 2005). However, the results of the current study are in agreement with a systematic review from 1965 to 1997 by Lebeouf-Yde (2000) which concluded that body weight should be considered a weak risk indicator for low back pain. The lack of significant association between BMI and low back pain in the current study could be that participants with a low BMI and lower weight perform tougher jobs and more strenuous activities leaving them more exposed and at a higher risk of suffering from low back pain.

The statistic results show that there was no significant association between low back pain and job categories (p=0.239) in this study. This reveals that there was no significant difference in job categories in terms of low back pain occurrence. The results also show that masons were the most affected with low back pain (58%). This is in agreement with a previous study which revealed that the prevalence of low back pain among masons is high compared to other construction workers (Stürmer, Luessenhoop, Neth, Soyka, Karmaus, Toussaint, Liebs & Rehder, 1997). The high low back pain prevalence rate among masons was mainly attributed to the nature of the work they perform. Masons lay large sandstone blocks and are engaged in building and laying heavy construction materials which could be as much as 50 kilograms or more (Van Der Molen, Veenstra, Sluiter & Frings-Dresen, 2004; Latza et al., 2000a). A previous study in Netherlands found out that masonry work demands a lot of high physical workload causing an increase in the moment and compression force at the low back (Van Der Molen, Kuijer, Hopmans, Houweling, Faber, Hoozemans & Frings-Dresen, 2008). One might speculate that the increased risk associated with masonry work in this study might also be attributable to moving heavy loads.

With regards to work experience, the association between low back pain and work experience found no significant association (p=0.864). However, the results of this study indicated that low back pain was common among workers with a two to four years working experience (32%) and was least common among the most experienced workers (20%) with a working experience of more than eight years in the construction industry. This result shows that the onset of low back pain among construction manual workers occurred during the first five years of employment. Contrary to the findings, Arndt et al. (2005) stated that older and experienced construction workers seem to be at increased risk of occupational disability as the relative risk of disability increases with older age and with longer duration of employment in the construction industry.

This is further supported by a study done by Stürmer et al. (1997) which found that working as a bricklayer for more than 10 years increased the likelihood of low back disorders by 2.3 times. Nonetheless, the findings of the current study were in agreement with previous surveys that established that workers with a long work time desire to decrease the weight of a load (Pope & Magnusson, 2002). This result also agrees that inexperience is related to a high injury rate (Jeong, 1997; Chi, Chang & Hung, 2004; Salminen, 2004; Fabiano, Curro, Reverberi & Pastorino, 2008). Salminen (2004) and Fabiano et al. (2008) attributed the reasons to be lack of experience in the particular activity, insufficient specific formal and informal knowledge about a particular job activity and to inadequate training periods. It could therefore be assumed that construction workers with five years or less experience were at a significantly higher risk of suffering from low back pain. Therefore, this could be the explanation to why older workers are more likely to be more experienced with sufficient specific knowledge about a particular job activity and consequently show a significantly lower frequency of low back pain.

5.5 OCCUPATIONAL RISK FACTORS FOR LOW BACK PAIN

It has been highlighted in literature that work tasks of construction workers are potential risk factors for low back pain (Punnett et al., 2005; Arndt et al., 2005; Deacon et al., 2005 Latza et al., 2000a). One general task of construction workers (scaffolding) and two work tasks of carpenters and concrete builders (sawing wood and erecting roof structures) were associated with particularly high risks of prevalence of low back pain in a German study (Latza et al., 2000a). Construction workers in this study reported their low back pain problem to have been caused by bending, load lifting, carrying, prolonged sitting, and adoption of a combination of different working positions such as rotation, turning and twisting. This is in agreement with the study by

Punnett et al. (2005) who reported that construction activities include repetitive trunk turning into flexion, extension and rotation, manipulation of heavy loads, heavy lifting that exceeds the lifting tolerance, forceful exertions and maintaining of awkward postures for long hours consequently leading to low back pain. Latza et al. (2000a) emphasised that lifting and carrying heavy loads weighing >50 kgs was a particularly hazardous task when erecting roof structures. The present study found high levels of low back pain among workers who mostly performed their work in bending (64.8%) and then standing (24.1%) postures. This is in accordance with previous literature (Punnett et al., 2005; Gallagher, 2008; Mounce, 2002; Latza et al., 2000a). One might speculate that the increased risk associated with bending posture in this study might be attributable to frequent asymmetrical movements in flexion and extension and/or may also be traced to spending lengthy static periods in the same bent position as it is shown that workers in this study spend 7-12 hours per shift on the construction site. Jones and Kumar (2001) highlighted that repeated activities without adequate rest was described as a category of injury increasing in occurrence in the work force. A study by Deacon et al. (2005) which found that concrete reinforcement workers demonstrated high rates of lumbago and sciatica, attributed to the amount of forward bending required, corresponded with the findings of the current study which recorded high rates of low back pain prevalence among workers who mostly adopted the bending posture while on duty. Based on this finding, one would hypothesise that frequent and prolonged bending are very high risky positions in the construction industry.

In construction work, heavy or frequent lifting, forceful movements, and carrying of heavy loads complicated by awkward posture are daily elements of required tasks (Arndt et al., 2005; Deacon et al., 2005; Siebert, Rothenbacher, Daniel & Brenner, 2001). Mazloum et al. (2006), reported that there are no simple and solid guidelines to show how much weight is "too heavy" or how many lifts per hour are "too many". This could be the reason that workers that manually lifted 70 kilograms and less, experienced the highest low back pain ratios in this study. There is also a reason to speculate that these workers carried out much more similar frequent and 'risky' movements that could have lead to them suffering from low back pain compared to other groups. However, out of four groups, the group that lifted the heaviest load (>90 kgs) was the second affected. This is in agreement with a previous study which reported that an increase in block mass leads to an increase in the moment and compression force at the low back of 20 Nm and 1 kN, respectively, per 5 kg block mass (Van Der Molene et al., 2004). If the load is too heavy or the frequency of lifting exceeds the tolerance, acute or chronic injuries (initially, mostly micro trauma) to the lumbar spine can be the consequence. This is further supported by Mazloum et al. (2006) who highlighted that the risk of lifting-related low back pain increases as the demands (force and frequency) of the lifting task increases. A job may be considered hazardous if the imposed loads (forces) exceed the individual's strength and endurance/tolerance, i.e., lifting of body loads may only be tolerated for a very short time (Mazloum et al., 2006). Latza et al. (2000a) found an increased risk of low back pain prevalence ratio (PR=2.6) for workers who lay large sandstone blocks (7-10 kg) for at least 2 hours per shift compared with workers who do not engage in such work.

The findings of this study therefore support the findings in literature that individual and occupational risk factors are associated to and influence the prevalence of low back pain among manual workers in construction companies.

5.6 ABSENTEEISM FROM WORK

In the construction industry, absenteeism can be influenced by the physical demands of the job. These include; standing or squatting to work, bending of the neck and back, carrying, lifting or pushing heavy loads and psychosocial factors such as job demands, excess workload, inability to cope, job dissatisfaction, social support, attitude of management and conditions of the workplace (Andrea, Beurskens, Etsemakers, van Amelsvoort, van den Brandt & van Schayck, 2003; Lund, Labriola, Christensen, Bultmann & Villadsen, 2006; Firth & British, 1989).

Absence per annum due to low back pain in a study done in Iran was 5% (Ghaffari et al., 2006). This was lower than the one year absence recorded in the current study which was 41.5%. Data from other western countries are similar though lower than the absenteeism reported in this study. Frank (1993) reported that UK estimates place low-back pain as the largest single cause of absence from work in 1988-89, and it is responsible for about 12.5% of all sick days. This figure as reported by Andersson (1999) is similar to data from Sweden where, since 1961, 11–19% of all annual sickness absence days are taken by people with a diagnosis of back pain. In 1987, 14.8 million workdays were lost in Sweden because of back pain, which constitutes about 13.5% of all reported sick days. Overall, 8% of the insured Swedish population was listed as sick with a diagnosis of back pain at some time during 1987 (Andersson, 1999). In the USA, the overall work-related absence due to low back pain among industrial workers was 26% (Guo et al., 1999), while 18 percent of workers lose an estimated 149 million days of work due to low back pain annually (Guo, Tanaka & Cameron, 1995 as cited by Shaw, Linton & Pransky, 2006). A study by Bautz-Holter, Sveen, Cieza, Geyth, and Roy (2008), reported that the consequences of low back pain among workers mainly lead to sick leave and disability pension often resulting in limitations in activity and restriction in participation. Even when employees are present at work, however, they may experience a decreased productivity caused by functional problems as a result of low back pain and other health problems (Meerding, Ijzelenberg, Koopmanschap, Severens & Burdurf, 2005). Masons recorded the highest percentage (54.5%) of absenteeism in this study. This could mainly be attributed to the high prevalence rates of low back pain among masons compared to other construction occupational groups. If a worker is suddenly absent on sick leave, their colleagues have to work harder to take care of all the tasks at present with a reduced number of workers. Then, the work must be done more hurriedly by the present workers on the reduced number to compensate for the absent colleagues. This consequently leads to reduced quality of production and more exposure to low back pain to the present workers. Isah, Omorogbe, Orji and Oyovwe (2008) highlighted that the direct and indirect cost of high level of absenteeism include the cost of medical bills, paying of additional overtime to workers, employing temporary workers, reduction in the standard and quality of production , disruption of working schedule, lowering of morale and increased dissatisfaction among workers. Loss of productivity is traditionally measured by illness-related absence from work (Berger, Murray, Xu & Pauly, 2001).

Based on the high rates of absenteeism reported in this study (41.5%), one would speculate that employers of construction workers in the current study experience reduced production rate and quality due to limitations of functional ability of the workers as a result of absenteeism caused by low back pain.

5.7 SYMPTOMS ASSOCIATED WITH LOW BACK PAIN

The current study established that there were other symptoms workers experienced as a result of their low back pain problem.

5.7.1 Physical problems

The workers reported limping and disturbances in balance while walking as a result of low back pain. This corresponded with previous studies which identified asymmetrical gait pattern (or limping) as significant in the performance of walking in chronic low back pain patients (Al Obaidi, Al Zoabi, Al Shuwaie, Al Zaabie & Nelson, 2003; Keefe & Hill, 1985 as cited by De Souza & Frank, 2007) and there is some evidence that these gait abnormalities are due to dysfunction of reflex pathways (Arendt, Graven, Svarrer & Svensson, 1996). The limping in walking could have been in the aim to change the spinal posture, avoid the painful action and hence alleviate the pain. Mientjes and Frank (1999) highlighted that patients suffering from low back pain swing their trunks and extend their knees much less as a guarding mechanism compared to healthy people. The results also found that participants had difficulties in urinating and emptying their bowels. The workers also confirmed having stomach/abdominal problems. This is in agreement with a previous study by Leino and Magni (1993) which highlighted that low back pain can lead to abdominal pain and other musculoskeletal symptoms.

5.7.2 Emotional problems

The current study highlighted that participants suffered emotional problems as a result of low back pain. The workers confirmed suffering irritability and short-temperedness, anxiety and becoming moody as a result of low back pain in more than half of their time at work. This has constantly been outlined in previous literature. According to Hartvigsen, Lings, Leboeuf-Yde and Bakketeig (2004), people with jobs characterised by low control over their work and high and conflicting work demands might be at higher risk for disease and less satisfied with their work. Presumably, a high level of social support may buffer this effect and low social support may amplify it (Hemingway & Marmot, 1999). Another study by Julie & George (2002) showed that depression, anxiety, coping strategies, fear-avoidance beliefs, and health locus of control have been linked to disability from low back pain. In contrast to the current study's findings, a systematic review of literature from 1990 to 2002 about psychosocial factors at work in relation to low back pain and consequences of low back pain found insufficient evidence for an association between stress at work and low back pain and that there was insufficient evidence for an association between perception of work and social support in relation to consequences of low back pain (Hartvigsen et al., 2004).

5.7.3 Functional Problems

The current study highlighted that most of the workers (87.7%) experienced low back pain during their activities while on duty with 70% being prevented from carrying out their activities at work because of their low back pain problem. The workers also reported experiencing the low back pain at rest and that the pain had affected their sleep and sex life. This limited their daily functional activities substantially. This corresponded with a previous study which highlighted that poor sleep can have a detrimental effect on daily functional activities, and addressing sleep problems may be a primary focus of rehabilitation (Mullis, Barber, Lewis & Hay, 2007). In Mullis et al. (2007) cohort study of ICF core sets for low back pain, it was outlined that patients reported sleep to be the most difficult thing in their life related to back pain. In contrast, De Souza & Frank (2007) in a study about experiences of living with chronic back pain, reported that it remains unclear whether more pain causes disturbed sleep or disturbed sleep leads to worse pain experience resulting in poorer function. However, the researchers concluded that disturbed sleep patterns may lead to worsening of function during the day. In this study, workers reported of their sleep being disturbed as a result of low back pain.

In general, the findings of the current study are also in accordance with a previous study by Andersson (1999) which highlighted that anxiety, stress, depression, somatisation symptoms, stressful responsibility, job dissatisfaction, mental stress at work, negative body image, weakness in ego functioning, poor drive satisfaction and substance abuse were among the psychosocial factors associated with low back pain.

5.8 THE EFFECT OF LOW BACK PAIN ON FUNCTIONAL ACTIVITIES OF THE PARTICIPANTS

The results of this study revealed that construction manual workers had difficulties in performing certain simple functional activities as a result of low back pain. Simple tasks were examined because they are much easier to perform than more complex motor tasks (Bjorklund et al., 2007). The inability to perform such simple activities is likely to have a detrimental effect on one's quality of life. The amount of distress caused to patients by being unable to do what they want to, is enormous and probably contributes to the degree of depression as noted in a large cohort of patients from north-west London (Frank, De Souza, McAuley, Sharma & Main, 2000). Ruta, Garratt, Wardlaw and Russell (1994) highlighted that the presence and intensity of pain is a poor health outcome on its own and correlates poorly with measures of physical functioning (Turk, 2002). Anderson (1999) reported that in the USA, back pain is the most common cause of activity limitation in people younger than 45 years. De Souza and Frank (2007) highlighted that mobility problems appear to be an issue causing concern to patients suffering from low back pain. Picavet, Vlaeyen and Schouten (2002), suggested that fear of movement may cause low back pain sufferers to avoid activities requiring physical effort. The preceding statements are in accordance with the findings of this study which found that workers suffered major limitations in running, lifting and carrying objects at work. This could be because of fear of aggravating their low back problem. This is consistent with a previous report on the influence of pain related fear and beliefs on activity performance (Al Obaidi et al., 2003). The same can be attributed to workers experiencing limitations in their ability to putting on and taking off socks, limitations in bending back forward and backward, side-bending back to the left and to the right, turning back to the right and to the left, difficulties in walking upstairs and also squatting down. With time, difficulty in performing such activities leads to constant fear which may have a negative psychological influence on the patient's general functional ability. These pain and function related psychological-fears may contribute to the inability of the primary care team to manage this pain satisfactorily and the need for referral to secondary care (De Souza & Frank, 2007). Construction manual workers experience difficulties in performing simple activities such as lifting the right and left leg consecutively when lying down, lifting up the left and right leg while sitting one at a time and lifting up the left leg while sitting. These findings are consistent with previous studies which found out that construction activities exacerbate low back pain in construction workers which consequently leads to limitations in daily activities such as standing, walking and bending (Meerding et al., 2005; Deacon et al., 2005).

5.9 PARTICIPATION RESTRICTION DUE TO LOW BACK PAIN AMONG PARTICIPANTS

The present study found that construction manual workers were unable to participate in certain activities they could have participated in had they not been suffering from low back pain. The results show that low back pain interfered with the workers' normal work. It has been suggested that people with low back pain have less physical capacity to complete essential and necessary everyday tasks (Spenkelink, Hutten, Hermens, & Greitemann, 2002). The study also revealed that low back pain interfered with the workers' ability to lift objects off the floor, bend, stoop, or squat and in walking or running. This is in agreement with previous studies which reported that construction activities exacerbate low back pain among construction workers (Meerding et al., 2005; Deacon et al., 2005) and that the low back pain had catastrophic effects on an individual's functional ability and daily activities such as standing, sitting, sleeping, walking, bending, lifting, carrying, travelling to work, socializing, interference with sex life and interference with personal care (De Souza & Frank, 2007: Bjorklund et al., 2007). De Souza and Frank (2007), in their study about experiences of living with chronic low back pain, reported low back pain patients being scared and unable to go anywhere and the roads being dangerous and even though none of the subjects were dependent on a wheelchair. This is also consistent with previous reports on the influence of pain-related fear and beliefs on walking performance and quality life style among low back pain sufferers (Al Obaidi et al., 2003). Because of pain on the one hand and fear of movement on the other hand, patients are probably more careful and consequently move slower or totally avoid movement hence the low back pain interfering with the mobility of the patient and the patient suffering permanent disability (Spenkelink, et al., 2002). A cohort study about the healthy worker survivor effect in the construction industry established that back & spine disorders among construction manual workers lead to about 63% of the workers retiring early and about 43% suffering permanent disability (Siebert et al., 2001). Retiring at a young age can be psychologically, socially and economically devastating as the worker would be forced to adjust to a completely new and different lifestyle to be able to cope with their predicament.

This study highlighted that construction manual workers experienced a decline in their income since their low back pain began. This could be attributed to the workers incurring more medical bills, due to sickness absenteeism and workers requiring help to complete their daily activities both at home and at work at a fee. This is consistent with previous studies which have shown that billions of dollars in societal and rehabilitation/medical expenditures are lost each year because of low back pain (especially in construction) (Childs et al., 2004; Pinto et al., 2007) and that the number of days lost due to sick leave and the costs incurred on the rehabilitation of low back pain have imposed socio-economic challenges among construction workers and the employers (Pinto et al., 2007).

The current study found that the most workers needed pain medication to control pain at work. Previous literature has shown that taking medication while on duty may lead to poor performance. Cockburn, Bailit, Berndt and Finkelstein (1999) highlighted that among health insurance claim processors, it was shown that workers who used sedating antihistamines experienced on average 8% reduction in daily work output in the three days after receipt of the prescription, relative to the regular number of claims per day handled by these workers. Another study by Meerding et al. (2005), reported that medical problems (such as low back pain) experienced by construction and industrial workers may lead to poor performance and reduced production caused by functional limitations.

In this study, the majority of the workers needed help from family and friends to complete everyday tasks. This means that the majority of the participants were dependant. The loss of independence can lead to isolation and emotional consequences due to feelings of helplessness as a result of limitations (De Souza & Frank, 2007). This could have contributed to the workers feeling more tensed, anxious and depressed in the current study. The present study revealed that the workers engaged less in sedentary leisure and hobby activities due to low back pain. De Souza and Frank (2007) highlighted that lack of leisure pursuits could consist of both physical and psychological barriers and that the reduction or cessation of leisure activities may also reduce opportunities for social interactions and may lead to social isolation. Previous literature has also shown that fear-avoidance behaviours and lack of leisure pursuits were observed among patients with low back pain compared to healthy adults (Akindele, 2007: Al Obaidi et al., 2003: Woolf & Pfleger, 2003).

The results of this study provide strong evidence of an increased disability and loss of quality of life among construction workers due to occupational related low back pain. Although most of the findings in this study correspond with other literature, no known in-depth study about the effect of occupational-related low back pain on the functional activities among manual workers in construction companies has been done. Therefore, the results of the present study make a contribution to the literature on the subject. It has been brought to light that construction manual workers suffer from a variety of ailments ranging from psychosocial to occupational disorders due to occupational related low back pain.

CHAPTER SIX

SUMMARY, CONCLUSION, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY

6.1 INTRODUCTION

In this closing chapter, a succinct summary of this study is provided. Conclusions are drawn from the major findings of the study. Thereafter, some recommendations emerging from the study are proposed.

6.2 SUMMARY

The aim of this study was to determine the effect of occupational-related low back pain on functional activities among manual workers in a construction company in Cape Town, South Africa. Determination of the prevalence and exploration of the perceived risk factors of low back pain have been investigated. The study also reported on the other symptoms associated with low back pain among construction manual workers.

The current study revealed a one year, one month and one week prevalence rates of low back pain which were 25 %, 69% and 54% respectively. The findings of the study showed that there was no significant association between the occurrences of low back pain with regards to age, the considered anthropometric measures, job categories, work experience, load manually lifted per day and the commonly adopted posture at work though.

The results also show that masons, construction workers aged 30 years and below and those with less than five years working experience, reported suffering low back pain than their colleagues. In this study, different working activities were attributed to be the cause of low back pain with bending emerging as the major activity causing the pain. The workers suffered physical, emotional and functional symptoms associated with low back pain. It was revealed that the majority of construction workers (70%) were prevented from doing their normal daily work with 41.5 % being totally absent as a result of low back pain.

Furthermore, construction manual workers were particularly concerned by the impact of their low back pain on their psychosocial, economic and functional wellbeing. In addition, the pain curtailed their leisure activities and hence may contribute to lack of independence and consequently social isolation. The workers expressed emotional regret at the loss of some of their physical capabilities and distress at the functional consequences of those losses.

6.3 CONCLUSION

Occupational-related low back pain is a serious concern among construction manual workers imposing urgent attention. The results of the current study exhibit occupational activities in the construction industry to be the causes of low back pain. Given the high number of sickness absence, the relatively high prevalence and the impact of low back pain according to the international classification of function and health in terms of impairment, activity limitation and participation restrictions as reviewed in literature, there is a need for a joint intervention strategy between construction management, health professionals at-large (especially physiotherapists) and construction manual workers. Addressing the matter in a biopsychosocial way will enable the best possible prevention strategy and decrease the high levels of absenteeism, psychosocial disorders, reduced productivity, impairments, activity limitations and participation restrictions.

6.4 RECOMMENDATIONS

Based on the findings of this study, the following recommendations are suggested:

1. Health practitioners, particularly physiotherapist, should address fully the prevention of low back pain at primary level by utilizing the patients' experiences of pain in their clinical practices. Health practitioners (physiotherapists) are better placed to set up health promotion education/interventions aimed at increasing awareness of factors that predispose manual workers to low back pain.
2. Low back pain treatment in clinical practices should include a thorough assessment and incorporate cognitive restructuring of pain beliefs in the workers during treatment, thus preparing the patient for a safe and an early return to work and therefore prevent further deterioration of the problem and suffering of psychosocial disorders. This will also reduce absenteeism while improving work productivity and further prevent impairments, activity limitations and participation restrictions.
3. The results of this study can be used to assist with policy development and effective preventive measures by the employers in low back pain risk prevention in construction. Effective preventive measures should include redesign of workstations to eliminate/reduce the need for bending and twisting, installation of lifting devices, have a greater variety of work tasks, to avoid repetitively loading the same body tissues and improved mechanical isolation to reduce whole-body vibration transmission.

4. Employers must fundamentally embark on proper and thorough orientation and ergonomic education/training of how to avoid low back pain "risky" activities when the construction manual worker reports for duty on the first day.
5. Though a daunting task in Africa due to other pandemics, further research is required especially of the psychological and economic impact of low back pain among construction manual workers.

6.5 LIMITATIONS

1. Construction workers in particular are difficult to study as they frequently change work sites, are often hired for temporary appointments and frequently change employers, therefore affecting the sample and population during data collection. This could also lead to difficulty in implementing preventive programmes.
2. Low back pain information was subjective, hence obtaining precise information was difficult.
3. This study was a cross-sectional design, convenient sampling and had a small sample size. This was due to limited time and financial constraints. Though the study used two different settings, the results cannot be generalised to entire construction industry in South Africa.

Therefore, further research is warranted to establish the extent of the problem in the construction industry, sector in South Africa. This will require larger scale investigation from multiple settings to increase the strength and generalizability of the results. Future studies should also consider detailed approaches to the extent of the psychological problem in order to decrease the psychosocial impact of the problem and to improve the present situation.

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APPENDICES

Appendix A

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E-mail: csjohnson@uwc.ac.za

HIGHER DEGREES COMMITTEE

25th November 2009

TO WHOM IT MAY CONCERN

Dear Sir/Madam

Research Project of Simon Himalowa (Student Number: 2968869)

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

His research proposal entitled ***"The effect of Occupational-Related Low Back Pain on Functional Activities among manual workers in a construction company in Cape Town "*** submitted in fulfilment of the requirements for Masters in Physiotherapy has been examined by the Higher Degrees Committee and found to be of high scientific value, methodologically sound and ethical.

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

Sincerely

DR GAVIN REAGON
Chairperson: Higher Degrees Committee

UNIVERSITY *of the* WESTERN CAPE

A place of quality, a place to grow, from hope to action through knowledge

Appendix B

DEPARTMENT OF PHYSIOTHERAPY

Private Bag X17, Belville, 7535
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Tel: +27 (0) 21 959 2542/ 2546
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Website: www.uwc.ac.za

The Human Resource Manager,
Grinaker-LTA Building Cape,
115 Bamboesvlei Road Ottery 7 800,
P.O. Box 3,
Rondebosch 7701,
South Africa.

10th March 2010.

Dear Sir/Madam,
Re: Request to conduct research at your construction site.
I am a Zambian national pursuing a Masters degree in Physiotherapy at the University of the Western Cape in South Africa. I am required by the University to conduct a research study as a partial fulfilment of the Masters Degree program in Physiotherapy. The proposed title of my thesis is **"The effect of occupational-related low back pain on functional activities among manual workers in a construction company in Cape Town, South Africa."** Please find attached copies of the proposal, the questionnaire and the letter of acceptance of my research proposal by the authorities of the University of the Western Cape-South Africa.

I hereby request permission to collect data from the construction manual workers at any of your construction sites around Cape Town. It is anticipated that the results of the study will challenge health professionals in the understanding of the magnitude of the problem hence the need for future strategic approaches in primary and secondary prevention of low back pain in the construction industry. Participation to the study will be anonymous, voluntary and confidential. Respect of the participants will be highly maintained. The information collected will be treated with confidentiality and kept in a secure filing cabinet or safe so as to safeguard anonymity. The results of this study will be made available to your company as well as the University of the Western Cape Physiotherapy Department.
A positive and timely response will be greatly appreciated.

Yours Faithfully,

....

Simon Himalowa Supervisor: Prof. José Frantz

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Appendix C

GRINAKER-LTA

THE AVENG GROUP

Grinaker-LTA Building Cape

12 July 2010

Higher Degrees Committee
Faculty of Community And Health Sciences

Attention: Dr Gavin Reagon (Chairperson)

Dear Sir

SIMON HIMALOWA

This letter serves as confirmation that Simon Himalowa (Student Number: 296 88 69) contacted Grinaker-LTA Building Cape requesting permission to undertake his data collection on "The effect of Occupational-Related Low Back Pain on Functional Activities among manual workers in a construction company in Cape Town".

Mr Simon Himalowa was granted permission and carried out his data collection, from 16th to 19th March 2010 at Grinaker-LTA Building Cape, FSB Contract, Silverboom Road, Platterkloof.

The management team of Grinaker-LTA Building Cape would like to take this opportunity to wish Simon well with his thesis and all future endeavours.

CHARLENE WHEELER
HR OFFICER

ON BEHALF OF GRINAKER-LTA BUILDING CAPE
A Division of Aveng (Africa) Limited

PLEASE REPLY TO ADDRESS INDICATED

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COMPANY SECRETARY KE ROBINSON

Appendix D

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

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

E-mail: mwarner@uwc.ac.za

INFORMATION SHEET

This is a research project being conducted by Simon Himalowa at the University of the Western Cape. We are inviting you to participate in this research project because you will assist in determining the effect of occupational-related low back pain on functional activities among manual workers in a construction company in Cape Town. This will assist to challenge health professionals especially physiotherapists for future strategic approaches in primary and secondary prevention of low back pain among construction manual workers. It will also add value to the scanty literature available.

The purpose of this research project is to assist in determining the effect of occupational-related low back pain on functional activities among manual workers in a construction company in Cape Town. It will also be a challenge to health workers such as physicians and physiotherapists to focus beyond treatment and emphasize on the importance of occupational health. Generally, construction has a reputation of being a particularly unhealthy industry because of its rate of work-related illness such as low back pain. Construction has the highest work-related illness across all occupational groups hence the serious need to address the issues of the risks involved.

You will be asked to answer the questionnaire by following the instructions on it. The questionnaire takes about 20 minutes to answer and it should be handed in to the researcher immediately after filling it in. The questionnaire asks about your age, job description, how long you have been working, whether you suffer from low back pain, how long you have suffered from it, how much it has affected your activities of daily living. The study will be conducted at the new construction site within the University of the Western Cape campus. Subjects may be required to participate in the study for a period of 1 to 2 weeks.

We will do our best to keep your personal information confidential. To help protect your confidentiality, your form will be kept and locked in a safe place, the survey is anonymous and will not contain information that may personally identify you, your name will not be included anywhere, a code will be placed on the survey and other collected data, through the use of an identification key, the researcher will be able to link your survey to your identity and only the researcher will have access to the identification key.

If we write a report or article about this research project, your identity will be protected to the maximum extent possible. In accordance with legal requirements and/or professional standards, we will disclose to the appropriate individuals and/or authorities information that comes to our attention concerning potential harm to you or others. There are no known risks associated with participating in this research project.

The benefits to you will be that more emphasis in promoting occupational health in construction companies will be highlighted depending on the outcomes. This research is not designed to help you personally, but the results may help the investigator learn more about, the effect of occupational-related low back pain among manual workers on functional activities in a construction company in Cape Town. We hope that, in the future, other people might benefit from this study through improved understanding of the problem as health professionals especially physiotherapist as they will be challenged to implement strategic approaches in primary and secondary prevention of LBP among construction manual workers. It will also add value to the scanty literature available.

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

This research is being conducted at the University of the Western Cape. If you have any questions about the research study itself, please contact:

Simon Himalowa

University of the Western Cape

Physiotherapy Department

Private Bag X17

Bellville 7535

Cell 0794465290

Email: simonhimalowa@gmail.com/2968869@uwc.ac.za

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

Study Co-ordinator: Prof. José Frantz

Head of Department: Prof Julie Phillips

Dean of the Faculty of Community and Health Sciences: Prof Rati Mpofu

University of the Western Cape

Private Bag X17

Bellville 7535

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

Appendix E

UNIVERSITY OF THE WESTERN CAPE

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

E-mail:

CONSENT FORM

Title of Research Project: THE EFFECT OF OCCUPATIONAL-RELATED LOW BACK PAIN ON FUNCTIONAL ACTIVITIES AMONG MANUAL WORKERS IN A CONSTRUCTION COMPANY IN CAPE TOWN.

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

Participant's name...
Participant's signature....................................
Witness Signature..
Date...

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

Study Coordinator's Name: Prof. Jose Frantz

University of the Western Cape

Private Bag X17, Belville 7535

Telephone: (021) 959-3936

Fax: (021) 959-1217

Email: jfrantz@uwc.ac.za

Appendix F

Questionnaire Number..........................

THE EFFECT OF OCCUPATIONAL-RELATED LOW BACK PAIN ON FUNCTIONAL ACTIVITIES AMONG MANUAL WORKERS IN A CONSTRUCTION COMPANY IN CAPE TOWN, SOUTH AFRICA.

This questionnaire must be completed by the participant after signed and written consent to participate in the study is granted. It is not required of you to put down your name, as the questionnaire is anonymous. The information obtained from this questionnaire is solely for the purpose of research.

Instructions

- Please fill in the spaces provided.
- Select one response by putting an X in the appropriate box.
- Please explain in short words where you are required to.
- Don't write your name on the questionnaire as it is supposed to be anonymous.

Thank you for your co-operation.

DATE

Demographic Information

As a participant, kindly answer the following questions by writing in the space or by putting a cross(X) in the appropriate box.

1. Gender a. Male ☐ b. Female ☐
2. How old are you? ....
3. What is your height..
4. What is your body weight?..
5. What is your job title (e.g. bricklayer, plaster, painter, scaffolder?).......................

6. Are you a

i.	Contract worker?	a. YES	☐	b. NO	☐
ii.	Permanent worker?	a. YES	☐	b. NO	☐

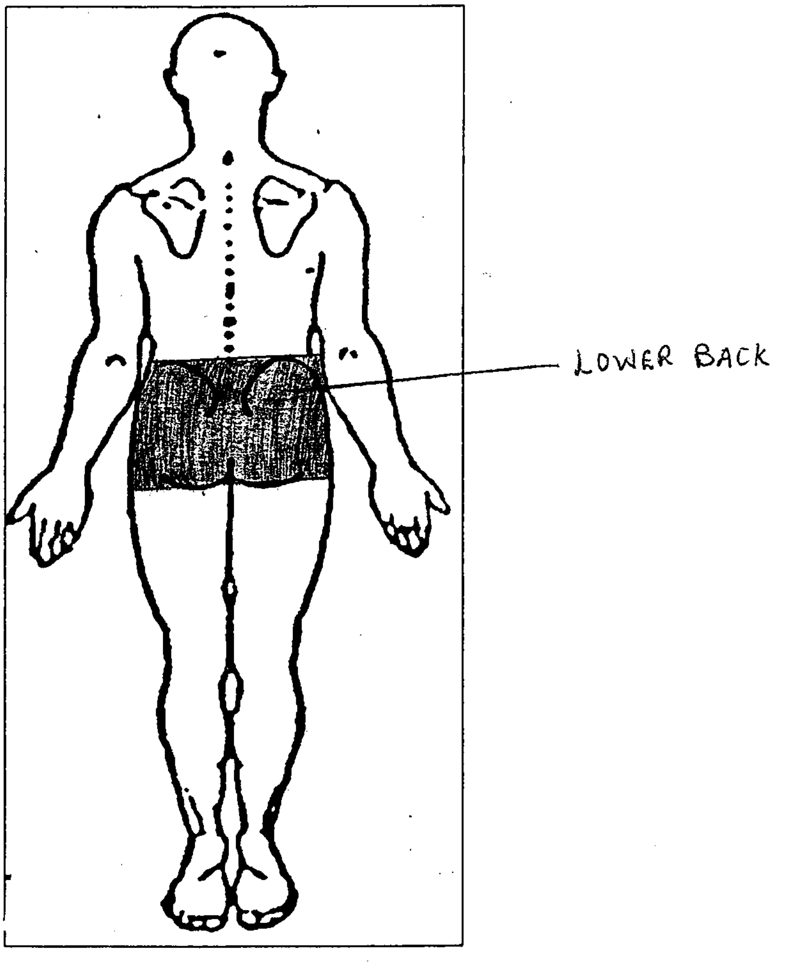
7. How long have you been working?..
8. How many hours do you work per day?..
9. What position do you mostly adopt while working?

i.	Standing	a. YES	☐	b. NO	☐
ii.	Stooping	a. YES	☐	b. NO	☐
iii.	Bending	a. YES	☐	b. NO	☐
iv.	Kneeling	a. YES	☐	b. NO	☐
v.	Sitting	a. YES	☐	b. NO	☐

10. Other..
11. What is the average weight you manually lift per day at your work?...........................

The following information is used to determine your low back pain symptoms;

The shaded part on the picture below shows the lower back of the human body from behind. Answer the following questions by writing in the space or by putting a cross (X) in the appropriate box.



1. Have you at any time during the last 12 months experienced:

   Pain, stiffness, soreness, ache, discomfort in your lower back (shaded area) whether or not it extends to one or both legs?

   a. YES ☐ b. NO ☐

   If NO, you can end here and thank you very much for your participation.

2. Can you relate the initial onset of low back problem to a specific incident?

   a. YES ☐ b. NO ☐ (specify):.................................

3. During the last 12 months have you been prevented from carrying out activities at work because of the problem in the back?

a. YES ☐ b. NO ☐

4. Have you ever taken time off work because of the low back problem?

a. YES ☐ b. NO ☐

If YES, how long?...

5. Have you had a low back problem any time during the last month?

a. YES ☐ b. NO ☐

6. Have you had a low back problem during the last 7 days?

a. YES ☐ b. NO ☐

7. Do you think your back problem is as a result of your job?

a. YES ☐ b. NO ☐

Do you experience:

8. Problems with urination?	a. YES	☐	b. NO	☐
9. Problems emptying the bowels?	a. YES	☐	b. NO	☐
10. Problems with your stomach?	a. YES	☐	b. NO	☐
11. Limping during walking?	a. YES	☐	b. NO	☐
12. Disturbance of balance?	a. YES	☐	b. NO	☐
13. Irritability, short tempered?	a. YES	☐	b. NO	☐
14. Anxiety?	a. YES	☐	b. NO	☐
15. Backache during activity?	a. YES	☐	b. NO	☐
16. Backache during resting?	a. YES	☐	b. NO	☐

Do your back problems affect?

17. Your sleep?	a. YES	☐	b. NO	☐
18. Your mood?	a. YES	☐	b. NO	☐
19. Your sex life?	a. YES	☐	b. NO	☐

The following scale tests your functional limitation;

Answer the following question by underlining one answer from 1- 6

Because of your low back problems, how do you manage to:

1) Stand?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

2) Walk?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

3) Sit?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

4) Lay down?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

5) Run?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

6) Carry?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

7) Lift?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

8) Throw?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

9) Put on and take off a sweater?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

10) Put on and take off socks?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

11) Bend your back forward?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

12) Bend your back backward?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

13) Side-bend your back to the right?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

14) Side-bend your back to the left?

   1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

15) Turn your back to the right?

1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

16) Turn your back to left?

1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

17) Walk upstairs?

1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

18) Walk downstairs?

1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

19) Squat down?

1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

20) Jump with both feet together?

1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

21) Lift your right leg when lying down?

1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

22) Lift your left leg, when lying down?

1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

23) Lift your right leg, when sitting?

1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

24) Lift your left leg, when sitting?

1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

What do you say about:

25) The condition of your work?

1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

26) Your general health?

1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

27) Return to work?

1. Very good. 2. Good. 3. Rather good. 4. Rather bad. 5. Bad. 6. Very bad

The following scale tests your participation restriction;

Instructions: These questions ask your views about how your pain now affects how you function in everyday activities. Please answer every question and cross (**X**) the ONE number on EACH scale that best describes how you feel.

1. Does your pain interfere with your normal work?

Work normally — Unable to work at all

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

2. Does your pain interfere with your traveling to work?

Travel anywhere I like — Only travel to see doctors

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

3. Does your pain affect your ability to sit or stand?

No problems — Cannot sit/stand at all

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

4. Does your pain affect your ability to lift overhead, grasp objects, or reach for things?

No problems — Cannot do at all

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

5. Does your pain affect your ability to lift objects off the floor, bend, stoop, or squat?

No problems — Cannot do at all

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

6. Does your pain affect your ability to walk or run?

No problems — Cannot walk/run at all

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

7. Has your income declined since your pain began?

No decline | Lost all income

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

8. Do you have to take pain medication every day to control your pain at work?

No medication needed | On pain medication throughout the day

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

9. Does your pain force you to see doctors much more often than before your pain began?

Never see doctors | See doctors weekly

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

10. Does your pain interfere with your ability to see the people who are important to you as much as you would like?

No problem | Never see them

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

11. Does your pain interfere with recreational activities and hobbies that are important to you?

No interference | Total interference

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

12. Do you need the help of your family and friends to complete everyday tasks because of your pain?

Never need help | Need help all the time

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

13. Do you now feel more depressed, tense, or anxious than before your pain began?

No depression/tension | Severe depression/tension

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

14. Are there emotional problems caused by your pain that interfere with your family, social and or work activities?

No problems Severe problems

0 -------- 1 -------- 2 -------- 3 -------- 4 -------- 5 -------- 6 -------- 7 -------- 8 -------- 9 --------10

____

(Researcher) Signature

Thank you for your time and for your participation in this study.