

**LOW BACK PAIN: A MYTH TO EMPLOYEES WORK
PERFORMANCE:
A CASE OF EMPLOYEES WORKING AT MUHIMBILI
ORTHOPAEDIC INSTITUTE**

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ORTHOPAEDIC INSTITUTE**

**By
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**A Dissertation Submitted to Mzumbe University Dar es Salaam Campus,
Faculty of Business Studies for the Partial Fulfilment of the Requirements for
Award of the Master degree of Human Resource Management of Mzumbe of
Dar es Salaam University**

2014

CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University, a dissertation entitled “**Low Back Pain: A Myth to Employees Work Performance: A Case of Employees Working at Muhimbili Orthopaedic Institute**” in fulfilment of the requirements for the award of the degree of Masters of Human Resource Management (HRM) of Mzumbe University

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I, **Swai, Flora**, declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

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I am alive only because it is God's will and His love over me which I acknowledge with all my heart. Without Him, this work would have not existed.

I would like to take this opportunity to express my sincere gratitude to many people who in one way or another contributed in giving a sense of direction in my dissertation. To list all those people who, knowingly and unknowingly have helped me to write this dissertation would be an impossible exercise. I am greatly indebted to my supervisor Dr. Madalle, whom I have freely drawn to his experience during the whole period of my research study.

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Above all, four people truly understood the nature of my frustrations with the difficulties that this study sought to resolve. On the other hand, since this research was close to their hearts, to quit was to let them down. They believed in this work's potential to make the world better and kept telling me that through hard work, success was possible. My husband, Anderson, my sons George and Gregory as well as my daughter, Victoria, thank you.

Finally, I am responsible for all that is written in this research work.

DEDICATION

To God, who has been and forever will be the pillar of my life, through his son Jesus Christ of Nazareth

And

To my beloved family for unconditional support and love: my husband Anderson and three children (Victoria, George and Gregory).

LIST OF ABBREVIATIONS

CDC	-	Centre for Disease Control
EA	-	Environmental Assessment
EU	-	European Union
LBP	-	Low Back Pain
MOI	-	Muhimbili Orthopaedic Institute
MSD	-	Musculoskeletal Disorders
PPE	-	Personnel Protective Equipment
SPSS	-	Statistical Package for Social Sciences
UK	-	United Kingdom
VDT	-	Visual Display Terminal
WHO	-	World Health Organization
WMSD	-	Work Musculoskeletal Disease

ABSTRACT

Background: The aim of the study was to assess the occurrence of low back pain (LBP) in relation to work performance among employees at the Muhimbili Orthopaedic Institute. Low back pain is the pain limited to the region between the lower margins of the last rib and the gluteal folds, regardless of the presence or absence of leg pain.

Methodology: The study adopts a descriptive cross sectional study design and simple random as well as convenience sampling technique was used to obtain results from study participants. The research findings were obtained through self-administered questionnaires as well as face to face interviews.

Results: Majority of respondents in this study are nurses, constituting 40% of the total. Hence, the leading group in this study are nurses. However, in drawing experience of Low back pain among employees, 117 (64.3%) experienced low back pain in their life time. On cross tabulation between age group and experience, it was found that the age group ranging from 30 to 35 (29.1%) are mostly affected. The research study also revealed that among respondents with low back pain, nurses are the leading group (46.1 %) followed by health attendants and administrators (21.3% and 12.8% respectively). In this study Low back pain is reported to be attributed to long hours of standing and sitting, lifting, as well as stressful working hours (30.8%, 26.9% and 20.0% respectively). Further analysis revealed that bending to lift patients from the bed or items from floor level, lifting style, sitting style are also main contributors to low back pain. Contributing to lower back pain in relation to sitting, bending and lifting is the fact that staff has not had requisite training on lifting and handling, or the proper recommended positions and height when sitting at the desk, which include monitor positioning for those using computers.

Conclusion and Recommendation: This study recommends that there should be the mandatory provision of health education on how to maintain posture as this is vital in contributing to reduce occurrences of low back pain. Proper manual lifting and handling techniques should be taught, with the appropriate and necessary equipment provided to properly carry out the tasks required in the workplace. This is with the aim of reducing manual work and promoting correct body positioning with the overall result of reducing lower back pain. Regular and appropriate exercise is also recommended.

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CHAPTER ONE

INTRODUCTION AND BACKGROUND INFORMATION

1.1 Background Information

Low back pain (LBP) is widely defined as pain that is limited to the region between the lower margins of the last rib and the gluteal folds, regardless of the presence or absence of leg pain (Louw, Morris & Grimmer-Somers, 2007). It is also known as sharp or dull pain or muscular stiffness occurring in the back, i.e. the region between the lower costal margins and gluteal folds, the pain being either localized or radiating into the lower extremities known as ischialgia (Koes, 2006). Tests used to help confirm the causes of back pain include but are not limited to X-rays, magnetic resonance imaging (MRI), computerized axial tomography (CAT) scan, bone scan, and bone density test.

LPB is a major health problem around the world, accounting for considerable socioeconomic and health care burdens (Maniadakis and Gray, 2000). "Low back pain is something that almost all people experience at some point in their lives. It is something common across sexes, age groups, countries, socioeconomic groups, education levels and occupation," said the lead author of the first study, Damian Hoy, a senior research fellow at the University of Queensland's School of Population Health, in Australia. "For the majority of people with low back pain, the specific cause is unclear," he said, but "there are certain factors that seem to put people at risk of having low back pain." Back pain according to Hoy, also varied significantly by geographic area. "Prevalence was highest in Western Europe followed by North Africa/Middle East, and lowest in the Caribbean followed by Central Latin America"

Irrespective of the economic status of developed countries, back pain is still a significant health concern as it is the most common cause of activity limitation in people younger than 45 years. According to Anderson (1999), low back pain is the second most frequent reason for visits to the physician, the fifth-ranking cause of

admission to hospital and the third most common cause of surgical procedure. "Back pain is the number one cause of lost work days in the U.S," said Dr. Anders Cohen, chief of neurosurgery and spine surgery at the Brooklyn Hospital Center, in New York City.

Hospital workers seem to have higher rates of low back pain compared to the general population due to physical and emotional factors such as stress which are occupational related (Landry, 2008). One of the main reasons a person develops low back pain and another does not may lie in their genes. With disc degeneration, Andersson says, "If you take twins - one who is doing heavy physical work and one who is doing desk work - and you compare their MRI exams, they are essentially identical. This tells you that genetic factors are very important."

Work activities involving bending, twisting, frequent heavy lifting, awkward static posture and psychological stress are also regarded as causal factors for many back injuries (Lau, 1995). The incidence of hospital workers experiencing low back pain varies among countries. A study done by researchers in Australia and the United States assessed data from 187 countries from 1990 and 2010. They discovered that just over one-third of all work-related disability was related to low back pain. The risk of low back pain was nearly four times higher for people working in agriculture, animal husbandry, forestry, fishing and hunting compared to other professions, reported a team led by Dr. Tim Driscoll of the University of Sydney, in Australia (2014)

Those who were employed in production, laborers and transport equipment operators had a 54 percent higher risk of low back pain, while service workers had a 47 percent increased risk, according to the study. Clerical work was associated with the lowest rates of low back pain. It will be apparent, throughout this study, that statistics and results for lower back pain and its occurrences are of a variable nature due to geographical, social, cultural physical, environmental factors and constraints. Prevalence for example, according to Damian Hoy of the University of Queensland, and colleagues in the *Annals of the Rheumatic Disease* was higher in men (mean

10.1%, 95% CI 9.4%-10.7%) compared with women (mean 8.7%, 95% CI 8.2%-9.3%). This is in contrast as we shall see further on in the study to Tanzania where there is a higher occurrence if the condition in women. According to Christiana D. Hinmikaiye, Eunice I. Bamishaiye a study carried out in Nigeria, where a response rate of 91% was obtained, 57 (78.1%) of respondents experienced the first episode of back pain after commencing nursing; more females (70%) than males (30%) were employed. 64.91% of the subjects rated their pain as moderate pain. The largest single category was 'low back', with 77.19% of the 57 analyzable responses.

According to data compiled by the School of Population Health at the University of Queensland, low-back pain is the leading cause of disability worldwide. This is backed up by another study that found the condition could be associated with an estimated one-third of all disability in the workforce. Hignett (1996) argues the problem and severity of lower back pain in Africa may be underestimated and indeed more severe than statistics suggest, due to poor reporting systems and lack of resources to carry out extensive and accurate studies. According to Andersson one of the main reasons a person develops low back pain and another does not may lie in their genes. With disc degeneration, Andersson says, "If you take twins -- one who is doing heavy physical work and one who is doing desk work -- and you compare their MRI exams, they are essentially identical. This tells you that genetic factors are very important."

Research on the relationship between health and productivity in the workplace finds that healthy workers more productive than unhealthy workers. An Australian study (Medibank, 2005) considered the combined effects of self-rated work performance and absenteeism data. They found that the healthiest employees are almost three times more effective than the least healthy, with the healthiest employees working approximately 143 effective hours per month compared to 49 effective hours per month by the least healthy). Healthy workers also rate their work performance much higher than unhealthy workers and have far fewer short-term absences than unhealthy workers. According to data compiled by the School of Population Health at the University of Queensland, low-back pain is the leading cause of disability

worldwide. This is backed up by another study that found the condition could be associated with an estimated one-third of all disability in the workforce.

The incidence of low back pain has continued to increase in modern societies such as the UK, USA and Canada (Cole et al, 2003). Its prevalence rates have been reported to be 39% in the UK (Hilman et al, 1998) and 21% in Hong Kong (Lau et al, 1995). In the US Ronald J. Wisneski, an orthopedic surgeon and specialist in spinal disorders and spine surgery, says that “eighty percent of the population of the United States, at some point in their life, is going to have back pain.” Up to 50% will have more than one episode of lower back pain culminating in the country spending approximately \$50 billion a year to address the problem according to William C. Shiel Jr. A cross-sectional study in a rural hospital in south-western Nigeria revealed that the prevalence of LBP among health workers was 46%, with the highest (69%) prevalence of LBP recorded among nursing staff, followed by 55% for secretaries/administrative staff, and 47% among cleaners and aides (Omokhodion et al, 2000). Low-back pain is one of the most common and costly musculoskeletal problems in modern society. It is suggested that low back pain may affect eight out of ten people (80%) in their lifetime. It is the single largest cause of disability worldwide. Almost four out of every ten people (37%) attribute their back pain to workplace risk factors Peter Moore (2014).

Various studies have reported the prevalence of LBP among health workers (Omokhodion et al, 2000; Sanya and Ogwumike, 2005), with nurses and physiotherapists more at risk as a result of repetitive lifting, prolonged standing and sitting (Hollingdale and Warin, 1997). Workers with jobs which require sitting or standing for long are at risk for LBP. Similarly, persons who are required to do the major causes contributing to the of loss of working hours and days among the hospital workers. Low back pain also decreases labour productivity due to time taken off work as well as early retirement (Tsuboi, et al., 2002). Due to its impact on work, low back pain was also considered an occupational disease (Yilmaz & Dedeli, 2012). Factors such as long working hours, wrong posture, psychological and physical stresses are highlighted as the contributors of occupational-related LBP

(ibid). In the United States, low back pain is second only to the common cold as a cause of hours and days lost in the workplace. It is also one of the most common reasons to visit a doctor's office and is the second most common neurologic complaint in the United States, second only to headache.

Likewise, the costs of ill health to business include staff turnover, absenteeism, presenteeism, disability and workers' compensation. Regarding turnover, Right Management (2009) identified an association between health and wellbeing and employee turnover since the organization which does not manage health and wellbeing well is four times more likely to lose talent in the next twelve months. In addition, there are problems of recording sickness and mode of loss-from-work. Problems with recording of sickness absence are not unique to Tanzania. Diverse sickness absence indices are used in different work settings. The countries with data usually derive it from local organizational or individual organizations.

Reasons for sickness absence are not always clearly recorded and work loss data are unlikely to capture the full extent of the sickness absence problem with shorter absences often remaining unrecorded. This lack of accurate baseline data, combined with the difficulty of comparing sickness absence data between organizations or work sectors leads to difficulties in measuring the efficacy of strategies aimed at reducing sick leave. It is against this background that this study sought to identify occurrence of low back pain in relation to work performance among public health employees.

1.2 Statement of the Problem

Low back pain is the leading cause of activity limitation and work absence throughout the world, imposing a high economic burden on individuals, families, communities, industry, and governments. LBP is acknowledged as a common cause of disability and related sickness absenteeism, and it is commonly used as a disability indicator. The causes of low back pain have not clearly been understood due to multi-factorial nature of its contributing factors. However, it has been proposed that occupational circumstances, physical characteristics, and social-

cultural influences could all be possible risk factors to the development of LBP (Anderson, 2001). As can be seen from the extensive, but not exhaustive list of probable causes of low back pain, it is vital to have a thorough medical evaluation to guide possible diagnostic tests. According to Stewart (2004), sickness absenteeism from work is an important indicator of LBP-related disability. Successful management of health-related lost labour time requires accurate measurement of lost productivity caused by health conditions in the workplace.

Despite studies which have been done in comparing groups of health service workers on the occurrences of LBP, little is known of whether certain health sector occupations are actually associated with a higher risk of LBP or any greater levels of LBP-related sick leave. Reasons for sickness absence are not always clearly recorded and work loss data are unlikely to capture the full extent of the sickness absence problem, with shorter absences often remaining unrecorded. This lack of accurate baseline data combined with the difficulty of comparing sickness absence data between work sectors is an interesting topic, hence the study.

According to Gilgil E, Kaçar C, Bütün B, &Tuncer T, there is a severe lack of information on the prevalence of LBP in developing countries which presents a serious problem, as it is predicted that the greatest increases in LBP prevalence in the next decade will be in developing nations.

1.3 Broad Objective

This study seeks to identify the occurrence of Low Back Pain in relation to work performance among employees at Muhimbili Orthopaedic Institute with a view to identifying opportunities to prevent and manage the condition so as to reduce the amount of days and hours lost due to sickness.

1.3.1 Specific Objectives

- (i) To determine workers knowledge of kinetic handling in the prevention of occupational-related LBP among MOI employees

- (ii) To identify occupational-related physical activities that could contribute to LBP among MOI employees
- (iii) To determine socio-demographic factors causing LBP among MOI employees
- (iv) To ascertain prevention strategies to reduce LBP among employees.

1.4 Research Questions

The following research questions were addressed:

- (i) To what extent does workers' knowledge of kinetic handling help in preventing occupational-related LBP among MOI employees?
- (ii) What are the occupational-related physical activities that could contribute to LBP among MOI employees?
- (iii) To what extent do socio-demographic factors cause LBP among MOI employees?
- (iv) How can prevention strategies reduce LBP among employees?

1.5 Justification of the Study

This study may enlighten on the factors contributing to low back pain. The study may also add value to the existing body of knowledge on the pervasiveness and risk factors associated with low back pain among employees at their work area.

Primary treatment of low back pain is based on the assumption that the pain in about 90% of people will go away on its own in about a month. Many different treatment options are available. Some of them have been proven to work while others are of more questionable use (Klippel, John2008). The prevention of back pain is, itself, somewhat controversial. It has long been thought that exercise and an all-around healthy lifestyle would prevent back pain. This is not necessarily true. In fact, several studies have found that the wrong type of exercise such as high-impact activities may increase the chance of suffering back pain (ibid). Further and continued research especially with a focus on Tanzania, is therefore warranted.

The findings may help employers in planning preventive services for low back pain through development of policy that may address factors that cause LBP. This can

promote employees safety and health with the consequential increase in productivity at the workplace.

CHAPTER TWO

LITERATURE REVIEW

2.1 Definition of Key Terms

Absenteeism

This is the time spent by employee for being absent at work place. According to Burton and Conti (1999), this term applies to scheduled absent (for example vacation time) or unscheduled absenteeism (due to illness).

Administrative control

These are set forth policies and practices that can reduce work-related musculoskeletal disorder risks but they do not eliminate workplace hazards.

Ergonomics

This is the science of fitting workplace conditions and job demands to the capacity of working population. In this study the use of ergonomics means to reduce stress associated with the overuse of muscles, bad posture and repeated tasks.

Engineering controls

These are approaches to prevent work related musculoskeletal disorder. This is achieved by designing job tasks to take account of capabilities and limitations of workforce.

Presenteeism

This measures the extent to which health symptoms and diseases adversely affect work productivity of individuals who choose to remain at work (Chapman, 2005).

Productivity

A measure of worker output impacted by the workers' health status.

2.2 Theoretical Framework

Theoretical framework involves a number of theories that are used in order to inform the conducted study. In this regard, Health Promotion Model was used since it involves seeking factors that might lead to LBP. LBP is a health condition that is commonly brought about, among other factors.

In the Health Promotion Model, an individual or collection of people must be able to recognize and understand objectives, satisfy needs and change or cope with the environment. This in turn makes an individual or group reach good physical and mental well-being. According to the World Health Organization (WHO), there are eight principles that inform an effective health promotion program. The principles include Evidence informed practice, Community participation, Supportive environment, Culture change, Action across the continuum, Partnership, Equity and Determinants of health.

2.3 Epidemiology of Low Back Pain

It is well known fact that low back pain is an important health problem in both developed and developing countries (Brooks, 2002). According to E. Volinn (1997), as literature on the epidemiology of LBP is accumulating, studies for the most part are restricted to high-income countries, with the result that little is known about the epidemiology of LBP in the rest of the world. Epidemiological study of low back pain holds an important stake at work places since low back pain causes obstacles in the work place. Amongst these are work absenteeism as well as economic burdens of treatment. However, low back pain results into socioeconomic loses, health and clinical problems at individual level and for the countries at large.

Epidemiology studies the health of human populations and its function. In case of the low back pain, various factors which causes low back pain are studied, included are; risks, effects of prevention measures and interventions of low back pain, the burden of low back pain, association of low back pain and age as well as time course changes of low back pain and so on. Low back pain can be caused by occupation. Occupational low back pain can occur in all workers in all types of jobs,

though the prevalence varies according to the type of job. Generally, agricultural workers, construction workers, drivers, mine workers and nursing aids show high prevalence (Parent-Thiron, et al., 2007) and variety of prevalence by job type is considered dependent on the nature of an individual's occupation, frequency, time, duration and occupational exposure.

2.4 Low Back Pain in a Broad Context

Low back pain is reported to have emotional impact on up to 80% of people at some point in their lives (WHO, 2003) and its occurrence and prevalence are approximately the same globally (Ehrlich, 2003). Low back pain is well-thought-out to be one of the major causes of musculoskeletal disability and is a common measure used in healthcare settings (Martin et al., 2009). Estimates of prevalence at any time-point vary from 11% to 21%, depending on the population selected and how LBP is defined (Heistaro et al., 2000; Picavet and Shouten, 2003).

The overall cost per patient with LBP differs significantly (Boonen et al., 2005; Martin et al., 2008), depending on the society studied and its healthcare funding. In 2008, back disorders were the reason for 2.3 million days of sick leave in Finland. Indirect costs, such as sick leave and early retirement contribute up to 85% of the total costs of LBP (Ekman, et al., 2005). Cost-of-illness studies lack a common methodology thus making comparisons difficult, and actual cost estimates can vary a great deal depending on the costing methodology employed (Maetzel and Li, 2002). In the UK, according to Maniadakis and Gray (2000), the National Health Service spends more than £1 billion per year on back pain related costs. This includes £512 million on hospital costs for back pain patients, £141 million on GP consultations for back pain, and £150.6 million on physiotherapy treatments for back pain. According to a 2003 report, there are additional (indirect) costs. The Health and Safety Executive estimates that musculoskeletal disorders, which include back pain cost UK employers between £590 million and £624 million per year. The total cost of back pain corresponds to between 1% and 2% of gross national product (GDP). This was reported by *the costs of accidents at work*, (1997).

Norlund AI & Waddell estimate that other European countries report similar high costs; back pain related costs in The Netherlands in 1991 were more than 4 billion euro. For Sweden in 1995 these were more than 2 billion euro.

Nearly 5 million working days were lost as a result of back pain in 2003-04. This, according to Williams & Wilkins, (2000) means that on any one day 1% of the working population are on sickness leave due to a back problem. Back pain is the second reason for long term sickness in much of the UK. In manual labour jobs, back pain is the number one reason according to Van Tulder (2006).

In addition to the financial losses to society and patients, LBP also has a major impact on various aspects of patients 'everyday lives. In an earlier study, 80% of patients reported that LBP impaired their ability to perform activities of daily living, such as toileting, driving and household chores. Approximately one-third of the patients refrained from participating in sporting activities because of their LBP (Duquesnoy, 1998). In another study by Lamers, et al., (2005), 47% of LBP patients spent less time on household responsibilities during the week prior to the study. For 35% of the patients, the household tasks were taken over by others). Additionally, in a Finnish study, 38.7% of patients with undefined LBP had to reduce their leisure-time activities (Heliovaara et al., 1989).

In the UK, the annual incidence of low back pain in the general population is 4.7%, the point prevalence was 19%, the past prevalence was 39% and the lifetime prevalence was 59% (Hillman et al. 1996). In a recent study of the general population in The Netherlands, the prevalence was found to be 46% for men and 52% for women. Work-related LBP was studied in African countries and high prevalence was identified in Nigeria (73.5%) and Ethiopia (60.0%) respectively (Sikiru & Shmaila 2009). However, annual prevalence of low back pain in Africa was reported to be between 14% and 72% (Louw, 2007). Western societies had a prevalence of LBP which ranged between 20% and 62% (Walker, 2000). The prevalence of LBP in Africa is therefore generally not lower than that of the Western world, as portrayed by literature (Louw, et al., 2007). The findings

appreciate the impact of the global burden of the disease of LBP, in addition to indicating that LBP prevalence among Africans is rising and is of concern. Further research into the most effective and suitable strategies to prevent and manage LBP in Africa is warranted.

At present, low back pain is treated mainly with analgesics. The causes of lower back pain are rarely addressed. Alternative treatments include physical therapy, rehabilitation and spinal manipulation. Disc surgery remains the last option when all other strategies have failed, but the outcomes are disappointing (Phillips et al., 2013). The damaged disc is removed and a metal and plastic disc about the size of a quarter is inserted into the spine. The best candidates for disc replacement surgery are those between the ages of 20 and 60 who have only one degenerating disc, do not have a systemic bone disease such as osteoporosis, have not had previous back surgery, and have failed to respond to other forms of nonsurgical treatment. Compared to other forms of back surgery, recovery from this form of surgery appears to be shorter and the procedure has fewer complications.

According to the "Low Back Pain Fact Sheet," the National Institute of Neurological Disorders and Stroke (NINDS), scientists are examining the use of different drugs to effectively treat back pain, more specifically daily pain that has lasted at least 6 months. There are also other studies comparing different health care approaches to the management of acute low back pain (standard care versus chiropractic, acupuncture, or massage therapy). Medication treatment options depend on the precise diagnosis of the low back pain. Different remedies as suggested by Stephanie Watson include:

- (i) Nonsteroidal anti-inflammatory medications (NSAIDs) are the mainstay of medical treatment for the relief of back pain. Ibuprofen, naproxen, ketoprofen, and many others are available. No particular NSAID has been shown to be more effective for the control of pain than another. However, your doctor may switch you from one NSAID to another to find one that works best for you.
- (ii) Spinal manipulation: Osteopathic or chiropractic manipulation appears to be beneficial in people during the first month of symptoms. Studies on this topic have produced conflicting results. The use of manipulation for people

with chronic back pain has been studied as well, also with conflicting results. The effectiveness of this treatment remains unknown. Manipulation has not been found to benefit people with nerve root problems.

- (iii) Acupuncture: Current evidence does not support the use of acupuncture for the treatment of acute back pain. Scientifically valid studies are not available. Use of acupuncture remains controversial.
- (iv) Transcutaneous electric nerve stimulation (TENS): TENS provides pulses of electrical stimulation through surface electrodes. For acute back pain, there is no proven benefit. Two small studies produced inconclusive results, with a trend toward improvement with TENS. In chronic back pain, there is conflicting evidence regarding its ability to help relieve pain. One study showed a slight advantage at one week for TENS but no difference at three months and beyond. Other studies showed no benefit for TENS at any time. There is no known benefit for sciatica.
- (v) Exercises: In acute back pain, there is currently no evidence that specific back exercises are more effective in improving function and decreasing pain than other conservative therapy. In chronic pain, studies have shown a benefit from the strengthening exercises. Physical therapy can be guided optimally by specialized therapists.

This suggests that there are no conclusive answers to causes, management and remedies for lower back pain, thus validating further and arguably more extensive research into the condition.

According to a WHO Scientific Group study on *the Burden of Musculoskeletal Conditions of the Start of the New Millennium*, and Woolf A, Pfleger (2003), one of the four frequent causes of disability musculoskeletal disorders is lower back pain.

The economic, social and public health effects of LBP are arguably on the increase in poorer nations and for the purposes of this study, Tanzania. Treating a condition that perhaps could have been prevented or indeed addressed in its early stages incurs a potentially large amount of shillings in medical expenditures. According to a study by B Walker, this economic burden is of particular concern in poorer nations

such as Africa, where the already restricted health care funds are directed toward epidemics such as HIV and AIDS (*The Prevalence of Low Back Pain: A Systematic Review of the Literature from 1966 to 1998*).

The literature on the epidemiology of LBP is accumulating, but for the most part, studies are restricted to high-income countries, therefore debatably little is known about the epidemiology of LBP in low-income countries such as Tanzania. A systematic review into the global prevalence of LBP by Walker in 2000, identified that out of the 56 included studies, only 8% were conducted in developing countries, with only one study conducted in Africa. Gaining insight and understanding in relation to the prevalence a of LBP in developing nations such as Africa and more specifically Tanzania, may contribute towards a better understanding of global LBP causes and management and will to a certain extent determine whether the factors differ in socio-cultural characteristics.

This study may also be an indication that publishable LBP research receives minimal support in developing nations and indeed Tanzania, reflecting constraints on health research resources available on the African continent for orthopaedic research, as a result of urgent research into other health threats such as HIV/AIDS. Indeed there is a lack of legislation of company policies that provide rehabilitation and support for those suffering from LBP as a result of a lack of training or provision of adequate equipment in the workplace to carry out the required duties. This, according to Frank J, Sinclair S, Hogg-Johnson et.al, is in contrast to the developed countries where legislation is in place to protect spinal health workers from lumbar spine injury is in place and is monitored by government bodies. with LBP and impart knowledge in practicing preventive measures amongst MOI employees, in addition to determining the extent to which and whether LBP is of concern amongst the targeted health professionals compared to how it is globally perceived.

This study may also serve as a pilot study that can be used to assess the prevalence of the condition in other parts of Tanzania.

2.5 Occupational Related Physical Activities Contributing to Low Back Pain

Most of musculoskeletal disorders are resulting from occupational activities. This is well documented in different literatures. Punnett and Wegman (2004) reported that physical ergonomic features of work are frequently mentioned as risk factors for LBP. Other factors are rapid work pace and repetitive motion, forceful exertions, non-neutral body postures, and vibration. Additionally, repeated heavy lifting, awkward back postures and repetitive activities as well as psychosocial stressors are known occupational related contributory factors to LBP (Durmus, 2012).

Occupational diseases are defined by World Health Organization (2001) as diseases which are causing adverse health conditions in a human being, the occurrence or severity of which is related to exposure to factors on the job or in the work environment and reports that such factors can be physical, chemical, biological, ergonomic, psychological stressors and mechanical. Musculoskeletal disorders (MSD's) are wide spread in many countries and they are single largest category of work related illness (Punnett and Wegman, 2004). The WHO treats occupational related and work related disease separately since occupational low back pain is included in work related low diseases (WHO, 2001).

WHO describes work-related diseases as multi-factor diseases which may frequently be work-related and when such diseases affect the worker they may be work related in a number of ways; they may be partially caused by adverse work conditions; they may be aggravated, accelerated or exacerbated by work place exposure; and they may impair working capacity (WHO, 2001). Adverse environmental agents was proposed as work place hazards by Schilling (1989) and work related diseases injury as the concept of work related disorders which has broadened to include categories with more understanding of the multiple causes of diseases.

Occupational low back pain can occur related to these work place hazards and the categories of work related disorders. Occupational low back pain is defined as the back pain caused by work-induced and related factors. Generally, physical,

psychosocial and personal factors interact with the onset of occupational low back pain. In Japan, Aoyama (1984) described occupational low back pain as the low back pain occurring after working for the first time though there is no incidence of low back pain before working, or low back pain becoming worse after working. He also indicated that high prevalence of low back pain is seen at the same place of work and the same type of job. Low back pain improved by measures such as improvement of working conditions and environment, absence and reshuffling of personnel in the place of work.

Occupational low back pain may also be defined as work specific low back pain classified as accidental and non-accidental. It is accidental if the injury occurs from an unexpected event, triggering injury during the execution of the task, resulting in injuries of the muscle, tendon, ligament and soft tissue (sprains and ruptures) in the back. It is also non-specific; where pain arises because of normal activities. Requirements of the task and poor body mechanics, prolonged activity, repetitive motion and fatigue are major contributors to injury. It is also difficult to determine the relationship between occupational or work related factors and low back pain because low back pain is not easily defined. Sickness absence data are influenced not only by pain but also by physical and psychological work factors, social factors and the insurance system such as; -

- (i) The healthy worker effect may bias data
- (ii) Exposure is difficult to determine, and
- (iii) There is poor relationship between tissue injury and disability (Pope et al., 1991).

Prevalence and incidence of occupational low back pain are different according to age, gender, type of job, nations and methods of investigations. According to Devereus et al., (1999) high physical and high psychosocial exposure increase risk of symptoms of back disorder. It is also considered that long working time or experience increases the risk of low back pain because occupational exposure time and occupational impact have negative effects. It is reported that prevalence of back pain in full-time workers is 25.3% compared to 19.1% in part time workers. The

prevalence of back pain is more than 23.0% among workers who work over 36 hours weekly and more than 38% among workers who work over 45 hours weekly (Eurofound, 2007).

In a study done among drivers, an uncomfortable working station, high daily vibration, annual driving mileage, long-day driving and cumulative total hours of occupational exposure (Alperovitch-Najenson, 2010; Bovenzi, 2010; Porter and Gyi, 2003; Tiemmesen et al., 2008) increase the prevalence of back trouble. High back pain was also reported among those exposed to manual handling or tiring posture (20%) compared to 11% who are never exposed to this strain (Plouvier et al., 2011).

2.5.1 Knowledge of Kinetic Handling in the Prevention of Occupational Related LBP

Low back pain is the leading cause of activity limitation and work absence throughout much of the world, imposing a high economic burden on individuals, families, communities, industry, and governments (Taimela, et al. 1997). Knowledge of kinetic handling is quite important as far as prevention of occupational related LBP is concerned. LBP is a serious problem among hospital personnel; the nursing staff, in particular (Silvia et. al., 2002). The nursing profession has been shown to be one of the most at risk occupation for low back pain (ibid). The primary cause for LBP in nursing is patient handling tasks such as lifting, transferring, and repositioning of patients because all these are done by manual handling.

Manual handling is defined as an application of a degree of physical force to lift, move, carry, put down, throw, push or pull a load by using one or both hands (Haslam et al., 2007). Kinetic handling training is vital to employees to be aware of the risk associated with manual handling, which in turn causes low back pain. In relation to health, low back pain and injuries among health care professionals is common. According to Swain et al, (2003), correct lifting technique is paramount

for the prevention of low back pain. Since most of the work in handling patients is based on lifting, this observation by Swain et al (ibid) is substantive.

General physical fitness was also identified as an effective measure in improving manual handling (Masher, 2000). Abreast with manual handling, risk assessment and work environment are also prominent in kinetic handling. Hence the use of comprehensive and multidimensional ergonomics interventions could be the breakthrough to reducing manual handling tasks (Straker, 2000). Educational awareness of the lifting techniques which are associated with good posture, for the reduction of low back pain, will also be of great benefit to the employees.

2.6 Factors causing LBP among Employees

Different factors such as bending, work posture, work load exposure such as lifting, lowering, pushing, pulling, carrying and holding cause LBP (Yeung, 2012). In fact, body movement through frequent bending, twisting and sudden movements, and working in bent-over postures are among the environmental factors contributing to low back pain (ibid). Studies by Kaila-Kangas, et al., (2004) and Eriksen (2004) also reported that work related factors such as handling heavy workloads, night shifts, lifting, bending, twisting, and pulling lead to lower back pain. . Additionally, Turk and Okifuji (2004) mentioned psychosocial variables that are causing LBP. These are stress, distress, mood and emotions, cognitive functioning, pain behaviour and depressive disorders.

Risk factors for LBP have not been adequately elucidated. The most frequently reported risk factor for LBP is heavy physical workload such as lifting, awkward posture, and whole body vibration (Ghekdof, 2005). Life style is also considered a risk factor of LBP; lack of physical exercise (Miranda et al., 2008), and short sleep hours (Mizoue et al., 1996) increase the risk of LBP. Other literature attributes occupational duties for most of the musculoskeletal disorders (MSDs) including LBP. MSDs exist across social class boundaries and are therefore viewed as a major, most common and most expensive occupational health problem; both in developed and developing countries (Yue et al., 2012).

“The physical ergonomic features of work are frequently cited as risk factors for MSDs, include rapid work pace and repetitive motion, forceful exertions, non-neutral body postures, and vibration (Punnett & Wegman, 2004). Durmusand Ilhanli (2012) further emphasized frequent heavy lifting, awkward back postures and repetitive activities as well as psychosocial stressors to be occupational predisposing factors to LBP. Peak lumbar shear force and cumulative lumbar disc compression were identified as robust mechanisms of injury leading to LBP. “Elevated spinal shear can result from a forward-inclined torso, particularly with loads in the hands, or from pulling actions in an upright posture” (Kerr et al, 2001).

The shear forces occurring with loaded trunk anterior and posterior flexion may be resisted mainly by the facet joints of the vertebrae that are known to have abundant pain receptors (Deyo, Rainville & Kent, 1992). The forces may also worsen existing inflammations or initiate inflammation within the facet joints or the annulus fibrosus of the intervertebral disc (Adams & Dolan, 1995).

Additionally, socio-economic factors are also risk factors for LBP and disability (Katz, 2006). By implication, LBP has socio-economic consequences on the resources of the individual and the society (ibid). Less than a decade ago, Katz (2000) reported that the total costs of low-back pain in the United States exceed 100 billion dollars per year. This cost was inclusive of indirect costs like loss of wages and low productivity. Direct costs; however also contribute highly to the negative social economic implications of LBP. They include costs of hospitalization, outpatient visits, medications, assistive devices, diagnostic tests and alternative therapies (Katz, 2006).

Although biomechanical, psychosocial, and social economic consequences of LBP are high and evidence-based, the disorder has still been under-prioritized and under-funded possibly, due to inconsistency in defining LBP, lack of suitable data and low ranking of global burden of disease (Hoy et al., 2010).

Moreover, psychosocial factors also cause LBP among employees. An investigation by Kerr et al. (2001) found a significant association between work-related psychosocial and biomechanical variables. From these findings, they suggested that primary work-related LBP studies should focus on both psychosocial and biomechanical risk factors. Accordingly, Pincus, Burton, Vogel & Field (2002) accepted that psychosocial factors play an important role during patient's transition from an acute state to a chronic state of LBP.

Personal factors are also among the causes of low back pain. These factors include age, gender, anthropometry, posture, muscle strength, muscle imbalances, spine mobility, education, medical history, physical fitness, habit (e.g. smoking) and socioeconomic conditions. Most people experienced their first episode of back pain before 35 years of age (Guo et al., 1995). In a European study, a prevalence of 18% was found before 25 years and 24% at 55 years and older (Parent-Thiron, et al., 2007). The prevalence is relatively consistent during the working years (Guo et al., 1995). Generally, age and years of work are correlated, as the length duration of work increases with advancing age. Moreover, occupational exposure increases with time. Additionally, the likelihood of disc degeneration and herniation increases with aging.

On the relationship between socioeconomic status and low back pain, most studies reported education as strongly associated with low back pain (Leclerc et al., 2009). Also prevalence and risk of low back pain is further reported among those with low income occupational status and manual workers. Latza et al., (2004) also supports Leclerc that low back pain is related to educational level and health insurance. A study by Omokhodion (2004) illustrates that farming activities which in developing countries are generally considered as 'low income occupational statuses, increase the odds of suffering LBP by four, compared with individuals not exposed to farming activities.

2.7 Effects of LBP to Employees

Presenteeism is another factor which is less visible but probably more expensive than absence from work. This is where workers come to work even when they are ill (Bevan, 2012). A UK study of the health of NHS workers conducted by The Work Foundation, RAND Europe and Aston University found that up to 70% of nurses and other healthcare workers reported coming to work when ill. Research by the Centre for Mental Health puts the cost of mental health-related presenteeism at £15 billion per annum – almost twice to cost of absence. The costs of back pain in the European Union (EU) have been estimated to exceed €12billion each year. Some 80% of health care costs are generated by the 10% of those with chronic back pain and disability (Bevan, 2012).

Of all musculoskeletal conditions in most countries, back pain accounts for the largest proportion of lost working days (Bevan, 2012). In UK, for example, 12.5% of all sick days are attributable to back pain, and 13.5% of all sick days in Sweden. In fact, Swedish workers with back and neck pain who are on sick leave from work represent a total cost of about 7% of the nation's expenditure on health services (ibid).

2.8 Prevention strategies of LBP among Employees

Various strategies for reducing LBP are available at work places. These are engineering control (ergonomic workplace design), administrative control as well as programs designed to modify individual factors, such as employee exercise (CDC, 1996). Under engineering control strategies, LBP can be prevented by changing the materials well as changing how products can be transported. (Lifting mechanical devices should be used to reduce manual heavy load lifting. This in turn reduces work that requires manual work (CDC, 1997). Adjustable workbenches also reduce occurrences of LBP among employees who are working with workstation.

The goal of ergonomics is to reduce stress, eliminate injuries and disorders associated with the overuse of muscles, bad posture, and repeated tasks. A workplace ergonomics program aims to prevent or control injuries and illnesses by

eliminating or reducing worker exposure to WMSD risk factors using engineering and administrative controls. Additionally, Personal Protective Equipment (PPE) is also used in some instances but it is the least effective workplace control to address ergonomic hazards. Risk factors include awkward postures, repetition, material handling, force, mechanical compression, vibration, temperature extremes, glare, inadequate lighting, and duration of exposure. For example, employees who spend many hours at a workstation may develop ergonomic-related problems, resulting in musculoskeletal disorders (MSDs).

Involvement of people in planning and controlling a significant amount of their own work activities, with knowledge and power to influence both processes and power to influence both processes and outcome in order to achieve desirable goals is known as participatory ergonomics (Wilson, 1995). On the other hand, Kourinka (1997) views participatory ergonomics as practical ergonomics with participation of the necessary actors with problem solving. The participation is not limited to worker participation but rather; include all levels of hierarchy with first-hand experience about the problem at hand. Participatory ergonomics is a psychosocial way of preventing LBP.

Consequently, administrative control is a strategy of reducing LBP at work places. This includes changing work practices as well as management policies. This goes abreast with reducing the length of work-shifts, limiting the amount of overtime, allowing more breaks to allow for rest and recovery as well as rotating workers through jobs that are physically tiring. Another key element of this strategy is training in the recognition of risk factors for LBP and job performance at large. Training programmes which focus on general ergonomics awareness are vital. For example, training on lifting and lowering, pushing and carrying, risk factors such as posture as well as vibration should be imparted to employees (CDC, 1997).

Another strategy is the Environmental Assessment (EA). According to CDC (1997), EA is achieved by observing workplaces to understand the employee setting and the physical factors that might cause LBP. For example, moving patient from Point A to

B, one has to consider distance; therefore consideration on the buildings, work station are vital as far as prevention of LBP among employees is concerned (ibid).

Additionally, a Flexitime policy is also a strategy for the prevention of LBP. This is manageable when employees are given shift work schedules; such as coming earlier or later taking a lunch break at alternative time (CDC, 1997). Truly speaking, flexitime allows employees to maintain work hours as well as attending physical activities. Likewise, organizational culture to health related program is another strategy to increase productivity. This can be achieved by writing formal or informal statements which promote employee's health. Supportive workplace health policies affect large group of workers and make adopting healthy behaviours much easier. Provision of lifestyle health promotion programmes in the workplace is helping in low back pain.

Studies have shown that exercise (i.e., improving overall fitness, strength, and flexibility) can reduce the incidence of low back pain, but the results are moderate and temporary. Exercise, however, may be useful for people with chronic back pain to help them return to normal activities and work. These exercises usually involve stretching manoeuvres. Initial treatment of low back pain is based on the assumption that the pain in about 90% of people will go away on its own in about a month. Many different treatment options are available. Some options have been proven to work whilst the effectiveness of others is in question. Research has shown that physical activity decreases pain, improves function, and delays low back pain. Generally, health-related programme strategies and interventions for physical activity include lifestyle activities that can be offered to individuals with low back pain. The prevention of back pain is itself, somewhat controversial. It has long been thought that exercise and an all-around healthy lifestyle would prevent back pain. This is not necessarily true. In fact, several studies have found that the wrong type of exercise such as high-impact activities may be factors that increase the chance of suffering back pain. Exercise, however, is important for overall health and should not be avoided. Low-impact activities such as swimming, walking, and bicycling can increase overall fitness without straining the low back.

From the aforementioned explanation about prevention of low back pain strategies and manual handling training is also vital. Manual handling has been defined as any activity requiring the use of force exerted by a person to lift, lower, push, pull, carry, move, hold, or restrain a person, animal or object (Carrivick et al., 2001). If these tasks are not carried out safely, there is a risk of injury. Research shows a significant linkage between musculoskeletal injuries and manual handling (Edlich et al., 2005; Hoozemans et al., 1998). With regard to manual handling, the primary area of physiological and biomechanical concern has been the lower back, particularly the discs of the lumbar spine (Kroemer, 1992).

In training perspective, attention should be given to the provision of lifting aids, task, work-place design and work organisation. Training then has a role of supplementing these approaches (Kaye, 2004). A number of authors (Chaffin et al., 1986; Kroemer, 1992; Straker, 2000) have outlined (3) solutions for safer and more efficient manual material handling. The approaches are personnel training, personnel selection and job design. The first two fit the worker to the job, while the third approach fits the job to the person (Kroemer, 1992). According to John Klippel (2008), various positions and activities undertaken in the workplace should be as follows:

(i) **Lumbar Support Belts**

Workers who frequently perform heavy lifting are often required to wear these belts. There is no proof that these belts prevent back injury. One study even indicated that these belts increased the likelihood of injury.

(ii) **Standing**

While standing, keep your head up and stomach pulled in. If you are required to stand for long periods of time, you should have a small stool on which to rest one foot at a time. Do not wear high heels.

(iii) **Sitting**

Chairs of appropriate height for the task at hand with good lumbar support are preferable. To avoid putting stress on the back, chairs should swivel. Automobile

seats should also have adequate low-back support. If not, a small pillow or rolled towel behind the lumbar area will provide adequate support.

(iv) **Lifting**

Don't lift objects that are too heavy for you. If you attempt to lift something, keep your back straight up and down, head up, and lift with your knees. Keep the object close to you, don't stoop over to lift. Tighten your stomach muscles to keep your back in balance.

2.8.1 Theoretical Model Relevant to this Study

The current study will adapt to health promotion model since it is among the prevention strategies to be ascertained in order to reduce LBP among employees. To influence good physical, mental and social wellbeing; an individual or group must be able to identify and understand aspirations, satisfy needs and change or cope with their environment.

Ideally, there are eight principles that inform an effective health promotion program. These have their foundation from a number of World Health Organization's consultative forums such as the Alma Atta declaration of 1978, Ottawa Charter for Health Promotion of 1986, Jakarta Declaration on Leading Health Promotion into the 21st Century of 1996 among others. The principles include Evidence informed practice, Community participation, Supportive environment, Culture change, Action across the continuum, Partnership, Equity and Determinants of health.

In this study evidence based practice, supportive environment and determinants of health are suitable. Hence study participants contributed ideas of their working environment and careers cause ill health. However, the findings of this study may be used together with other principles of the health promotion model to develop a health promotion programme to prevent LBP among employees.

2.9 Empirical Literature

A study by Sanya and Ogwumike (2005) reported that employees performing repetitive lifting, prolonged standing and sitting have high prevalence of acquiring

LBP. Workers with jobs that require workers to sit or stand for a long period are at risk of LBP. This report is in line with a review released by CDC (1997) that routine lifting of heavy objects, daily exposure to whole body vibration, work with neck in chronic flexion position or performing repetitive forceful task results to LBP. On the other hand, high costs to employers such as absenteeism, lost productivity as well as increased healthcare are reported among employees with LBP (ibid).

An earlier study by Garg and Moore (1992) revealed that incidence, severity and disability are related to physical demands of the job. Therefore a job involving lifting, lowering, pushing, pulling, carrying and holding contributes to LBP. In addition, body movements such as frequent bending, twisting and sudden movements as well as working in bent over posture appear to have significant potential for producing back pain.

Rossi et al., (1999) conducted a study which revealed that service workers are prone to LBP and related disability due to physical factors. This goes along with the study done by Maniadakis and Gray (2000) that LBP is associated with major costs in terms of health usage and absenteeism. Vingard et al., (2000) reported that a combination of high physical and psychosocial load increase the risk for LBP in working men and women.

Indeed, several African studies have focused on work-related LBP where Sikiru & Shmaila (2009) reported a high prevalence of LBP in Nigeria (73.53%) and Ethiopia (60%) respectively. Louw, Morris and Grimmer-Somers (2007) also reported that the prevalence of LBP in Africa ranged between 14% and 72% annually. Western societies had a prevalence of LBP that ranged between 20% and 62% (Walker, 2000). The prevalence of LBP in Africa is therefore generally the same as that of the Western world, as portrayed by literature (Louw, et al., 2007). A study done in Ibadan, Nigeria; aiming at determining risk factors for back pain among office workers as well as performance and job satisfaction, it was found that office workers have severe back pain which is associated with sitting more than three hours.

However, majority of workers reported that they are underperforming due to severe back pain (Sanya and Omokhdoin, 2002).

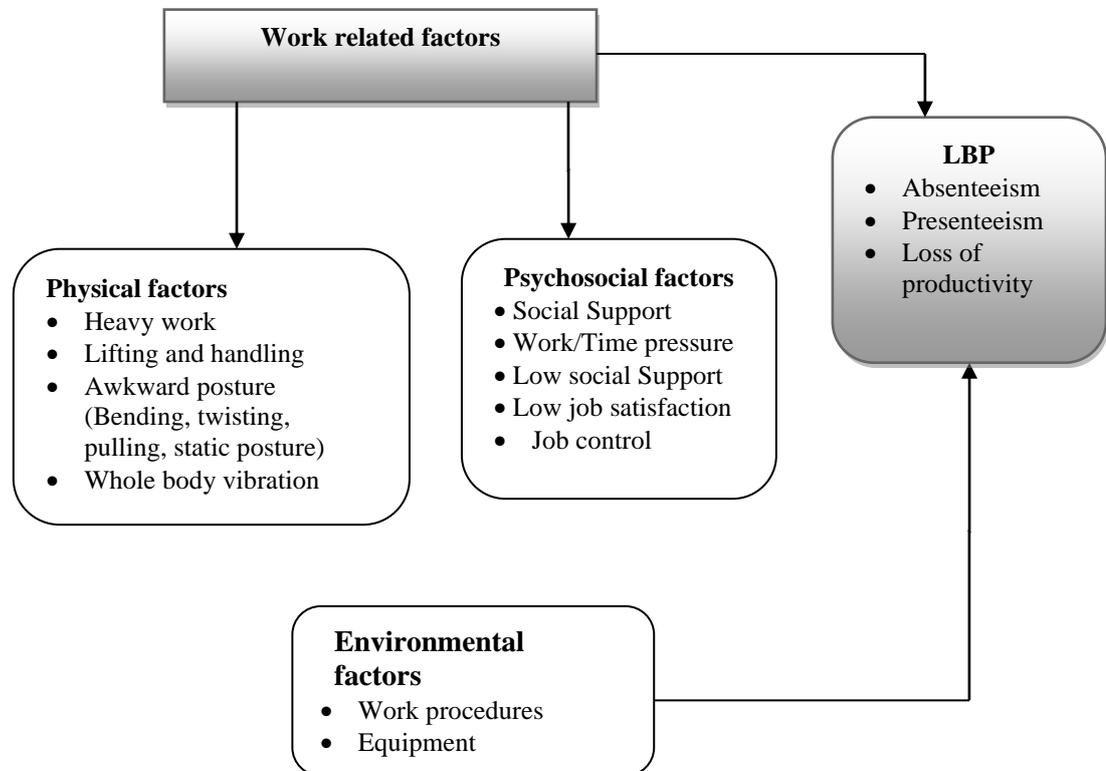
A cross sectional study done by Ponagiotis, et al., (2002) among office workers in Greece also revealed high prevalence of low back pain. According to these researchers, LBP might affect the Greek economy since the majority of respondents are out of their work and presenteeism performance is not good. Tsuboi et al. (2002) also found that LBP decreases labour productivity due to time taken off work, absenteeism as well as early retirement.

A study LBP among rural staff in a rural hospital in South Western Nigeria found that the prevalence of low back pain among staff was 46 % (Omokhoidon, 2000). The highest prevalence of back pain (69%) was recorded among nursing staff, followed by secretaries/administrative staff (55%) and cleaners/aides (47%). Heavy physical work (45%), poor posture (20%) and prolonged standing or sitting (20%) were the most frequent activities reported to be associated with low back pain among these workers. The prevalence of low back pain among these workers is comparable to that of workers in high income countries. Health education on posture and correct lifting techniques was recommended to reduce the burden of low back pain among these workers (ibid).

2.10 Conceptual Framework

Conceptual framework is a map directing a researcher where to obtain the required information. Physical, psychological and environmental factors are interacting in various ways to cause occupational low back pain. These factors are conceptually presented in this study since they have an association with the incidence of low back pain and its consequences. The influence of these risk factors are reported, but with various results. Figure 2-1 below represents the conceptual framework to the study.

Figure 2.1: Conceptual Framework



From the above conceptual framework, various factors which relate in causing LBP have been drawn out. For example, ergonomic factors might link work procedure and equipment. However, attention should be on how the factors are interacting with each other. Environmental factors, which include work procedures, equipments, and organizational factors, are all causing LBP.

Physical factors are also associated with LBP. According to Bernard et al., (1997) heavy work is defined as work that has high energy demands or that requires some measure of physical strength. Heavy tiring tasks, manual materials, handling task and heavy dynamics and intense work can cause low back pain and this is shown in the conceptual framework under the physical factors. Manual handling includes lifting, moving, carrying and holding loads (ibid). Lifting includes moving an object from one point to another. In addition, forceful movements which include movement of objects pulling, pushing or other efforts can cause LBP (ibid).

Bending, twisting as well as awkward posture also contribute to low back pain. According to Bernard et al., (1997), bending is referred to as flexion of the trunk usually, in the forward or lateral direction while twisting is defined as rotation of the trunk or torso. Awkward posture, on the other hand, includes non-neutral trunk postures (related to bending and twisting). All these have a positive association with low back pain and work related factors (ibid).

Static work (sitting or standing) is also associated with low back pain. Static work includes very little movement that occurs along with cramped or inactive posture that cause static loading on the muscle (ibid). This includes prolonged standing or sitting and sedentary work. Due to technological novelties, the number of static work has increased extremely (for example, office/VDT work, and control task). In the review done by Hales and Bernard (1996); they found that prolonged sitting is a potential risk for the development of low back pain. During sitting a prolonged compression force may increase the risk of disc problem (Videman et al., 1990). Continuous activity of some type I motor units of (back) muscles may contribute to the development of fatigue (Hägg et al., 1991).

As shown in the conceptual framework above, psychosocial factors are also causing low back pain. These include low social support, increased work/time pressure, low job satisfaction, job content, stress as well as mood and emotions. According to Hoogendoorn et al., (2000) poor job content includes monotonous work, few possibilities to learn new things and to develop knowledge and skills at work. Studies have been done and revealed a positive association between monotonous work and reports of low back pain (Burdorf and Sorock, 1997).

Increased work/time pressure has been noted to have an association with low back pain also. A number of studies have reported relationship between perception of intensified work load (as measured by reports of time pressure and high work place) and self-report of low back pain (Bernard, 1997). Under psychosocial factors, social support is also reported among the factors causing low back pain. This includes co-workers and supervisors' relationship at work and problems with work-mates and

superiors. According to the studies done, there is strong evidence that low social support in the work place is a risk factor for low back pain (Hoogendoorn, et al., 2000). There is also strong evidence that job satisfaction is the factor of low back pain (ibid). This relation is also reported by Burdorf and Sorock (1997).

Further research has proved a strong significant relationship between work- related factors where both psychosocial and biomechanical risk factors are causing LBP (Kerr et al., 2001). Furthermore, Pincus, Burton, Vogel & Field, (2002) also reported that psychosocial factors play an important role during patient's transition from an acute state to a chronic state of LBP. Psychosocial work characteristics are known to influence the biomechanical load through changes in posture, movement and exerted forces. Physiologic mechanisms such as increased muscle tension or increased hormonal excretion can be triggered by psychosocial factors; and in the long-term lead to more intense musculoskeletal pain perception and symptoms.

However, illness coping mechanisms and abilities of an individual may be changed by psychosocial factors, hence influence the reporting of musculoskeletal symptoms. Finally, the implications may be confounded by the effect of physical factors at work (Hoogendoorn et al., 2000). These implications are applicable to employees with LBP.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

This study adapts to a descriptive cross sectional study design. The researcher opted for this design since the amount (frequency) and distribution (person, place and time) of an event or situation in the study population is being described.

3.2 Study Area

The study was conducted at Muhimbili Orthopaedic Institute, Dar es Salaam region. MOI is a public institution under the Ministry of Health and Social Welfare. It is a university teaching hospital and serves as a tertiary level referral Orthopaedic and Trauma hospital in Tanzania. It is situated in Upanga, Ilala District.

The organization is chosen since it has various employees: doctors, nurses, paramedical staff, office workers and supportive staff (non-medical staff) who are undertaking different tasks within the organization. The reason for including all employees is to examine the occurrence of low back pain in relation to work performance. Furthermore, this area is chosen since the researcher is familiar with the organization and is in the health profession as well; hence access to information was well managed. Additionally, the researcher is interested in examining how LBP can cause harm to health care employees as well as supportive staff.

3.3 Study Population

Population presents whole group or collective group of people with one or more shared characteristics. Araoye (2004) describes a study population as the wider group to which findings from the study are generalized. In this study, the population was all the 610 MOI employees. Accessible population is the portion of the population that is available to the researcher. This population actually represents the sampling frame, which is the group from which the sample is actually taken (Baumgartner, Strong & Hensley, 2002).

3.4 Sample Size and Sampling Techniques

Creswell (2002) defines a sample as a subgroup of the study population that the researcher plans to study for generalizing about the study population. Due to time and space constraints, it is not feasible to include all the 610 employees in the study.

3.4.1 Sample Size Calculation

Sample size represents the number to be selected to stand for the sample. In this study Nassiuma's formula was used to calculate sample size. Nassiuma's sample size conditions are:

- (i) If population is ≤ 1000 – Sample size should be $1/3$ of the population
- (ii) If the population is above 1000 – use the following formula

$$n = \frac{NC^2}{C^2 + (N-1)(e^2)}$$

Where:

n - Sample size to be determined

N - Total number of the targeted population within a population in the study area

C - The coefficient of variation $\leq 30\%$ usually acceptable

e - is the relative standard error, 5% is acceptable

In this case, MOI employees are 610, which is less than 1000. Therefore, the first formula was used to calculate the sample size. It is as presented mathematically as follows;

From $n = 1/3 \times$ employees population

$$\begin{aligned} n &= 1/3 \times 610 \\ n &= 610/3 \\ n &= 203 \end{aligned}$$

The sample size for this study was 203, as calculated from Nassiuma's formula.

3.4.2 Sampling Technique

Sampling technique is a process of acquiring sample for the study purpose. In this case Simple Random Sampling technique was used. This method was opted since every individual has a chance of being selected without bias.

3.4.2.1 Simple Random Sampling Technique

The simple random sampling technique was used in selecting study respondents. The researcher obtained a list of all workers names by department/section from the Administrative Office. Thereafter, the researcher picked a name after every 5th entry until the required sample was reached. On the other hand, researcher used convenience sampling technique in this study to cover up for the names which was picked but found that the person was not available during data collection.

3.5 Data Collection

Data collection is the process of acquiring information from respondents. Data collection techniques are the ways of which data is gathered from study respondents. In this study three types of data collection methods were employed. These methods were a survey through a self-administered questionnaire, face to face semi-structured interviews which were used to obtain information from the study participants. The third method was documents review.

3.5.1 Questionnaire

A Questionnaire is a set of questions which are prepared by the researcher to answer study objectives. In fact, questionnaires are completed by a number of potential respondents following the same procedure. It is often a good tool for collecting a large amount of quantitative data. In this study, a questionnaire (in Appendix II) was used to obtain information about LBP and job performance from respondents.

A self-administered questionnaire with closed ended questions was used to gather information from study participants.

3.5.2 Interview Guide Questions

Interviewing is the systematic collection of data by asking questions, then carefully listening to and recording or noting the responses concerning the study topic. This type of data collection technique provides access to a range of experiences, situations and knowledge. In this study, face to face interview enabled the researcher to gather more information from participants since it allowed conversation between the interviewee and interviewer (see Appendix III). In this regard unstructured interview guide questions were prepared to guide the interview sessions. All data were collected at MOI during lunch break. Informed consent was obtained after explanations of the study were given to them. All participants were told they were free to refuse to respond to the questionnaire at any time.

3.5.3 Documentary Review

Documentary review was used because secondary data contained information on low back pain which were crucial to the study. Documentary reviews are documents which have been researched and published. The researcher reviewing the factors that lead to low back pain from the available published reports in the form of journal articles.

3.6 Validity and Reliability of the Study Tools

Validity is the ability of a study to measure what the investigator intends to measure (Araoye 2004). Content validity is concerned with the adequacy of coverage of the content area being measured (Polit, Beck and Hungler, 2001). From the aforementioned, the researcher took her time to develop the questionnaires to ensure that the questions elicited necessary information in accordance with the objectives of the study.

A statistician examined and appraised the content of the questionnaire to ensure that all the content variables were included (Araoye, 2004). The draft questionnaire was independently reviewed by experts from Mzumbe University to ensure relevance, appropriateness and adequacy of the questions. The review feedback was used to improve the first draft. The final version was pre-tested on some health care facility

staff to assess its wordings and clarity. The pre-testing facility was not the part of this study's population. External validity refers to the generalizability of the study findings from a sample to the reference population (Araoye, 2004). In this study, external validity was assured by selecting a representative sample of the study population and using a probability sampling technique.

Reliability, also known as reproducibility or repeatability is the stability or consistency of information. In other words, reliability means the extent to which similar information is supplied or obtained when a measurement is performed more than once (Araoye, 2004). To test for reliability of the tool, the test-retest method was used. The questionnaire was administered and re-administered to 20 respondents after a 2-week test-retest interval. Reliability was established during the pre-testing of the instrument.

3.7 Data Analysis

Data analysis is a systematic organization and synthesis of research data and a testing of the research hypothesis using the data (Polit and Hungler, 1999). Data analysis was done in collaboration with a biostatistician using Statistical Package for Social Sciences (SPSS) statistical software. In this study, data were summarized using frequency and percentage. Frequencies of participants knowledge was based on their score as shown in the questionnaire as poor, fair, good and excellent. Also participants' attitude towards low back pain was graded in the questionnaire as negative or positive. Cross tabulation was used to describe the study participants age and work experience. Further cross tabulation was done to determine prevalence of low back pain by gender and occupation.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter includes the presentation of responses, analysis and findings of data collected from the questionnaire, interview, personal observation and documentary evidence. The researcher distributed two hundred and three (203) copies of the questionnaire. However, it is important to state that only one hundred and eighty two (182) copies of questionnaire were filled and returned to the researcher. Consequently, presentation, analysis and conclusion of the study are based on the 182 returned questionnaires.

4.2 Questionnaire Response by Respondents

The study targeted 203 respondents and the responses per category of staff are shown in the table below.

Table 4.1: Response by Respondents

Category	Target Population.	%	Response	% Response
	90	44.3	80	44.0
Nurses	7	3.4	4	2.2
Gardeners	35	17.2	34	17.7
Health Attendant	5	2.5	5	2.5
Lab. Technician	5	2.5	4	2.2
Radiographers	8	3.9	7	3.8
Physiotherapy	25	12.3	22	12.1
Administration	28	13.8	26	14.3
Doctors				
TOTAL	203	99.9	182	98.9

Source: Researcher, 2014

As indicated in table 4.1, the response to the study was 98.9%. The high response is attributed to the researcher's personal involvement in the study. This shows that the participants were most willing to contribute to the study. As for the rest (1.9%) who declined to participate in the study, they attributed it to one of the ethical considerations that clearly stated that participation in the study was voluntary.

4.3 Respondents' Profile

This part presents the profile of the respondents who participated in the study. Descriptive statistics involve transformation of raw data into a form that would provide information to describe a set of factors in a situation. This is done through ordering and manipulation of the raw data collected (Sekaran, 2000). In this study therefore, descriptive statistics was used to derive frequencies and percentages, as presented in the four tables below.

Table 4.2: Respondents Profile by Gender

Variable	Category	Frequency	Percentage*
Gender	Male	80	44%
	Female	102	56%
	Total	182	100%

Table 4.3: Respondents Profile by Age

Variable	Category	Frequency	Percentage*
Age (in years)	18 to 23	14	8 %
	24 to 29	30	16%
	30 to 35	53	29%
	36 to 41	35	19%
	42 to 47	30	16%
	48 and above	20	11%
	Total		182

*Percentages have Been Rounded

Table 4.4: Respondents Profile by Academic Qualifications

Variable	Category	Frequency	Percentage*
Academic Qualifications	Primary	10	6%
	O level	19	10%
	Post-secondary	153	84%
	Total	182	100%

*Percentages have been rounded

Table 4.5: Respondents Profile by Nature of Work

Variable	Category	Frequency	Percentage*
Nature of work	Nurses	80	44%
	Gardeners	4	2%
	Health Attendants	34	18%
	Laboratory Technicians	5	3%
	Radiographers	4	2%
	Physiotherapy	7	4%
	Administration	22	12%
	Doctors	26	14%
	Total	182	100%

*Percentages have Been Rounded

Table 4.6: Respondents Profile by Working Experience

Variable	Category	Frequency	Percentage*
Work Experience in years	1 to 2	22	12%
	3 to 4	36	20%
	5 to 6	18	10%
	7 to	52	29%
	9 to 10	24	13%
	11 and above	30	17%
	Total		182

*Percentages have Been Rounded

Results from the tables above show that out of 182 respondents, 56.0% (102) were female and 44.0% (80) were males. Consideration was also given to age groups of study respondents. The age group with great number of respondents was the age ranging from 30 – 35 years, which is 29.1% of the total respondents. This age group is highest probably because this generation is productive and is likely to stay longer with the organization. There are also 19.1% respondents aged between 36 and 41. Respondents with age group ranging from 18 – 23 were 14 (7.7%). Others had age ranging from 48 and above which are made up with 20 (11.0%) persons. In this study female respondents outnumber male counterparts. This implies that females are the core employees in this institution.

Working experience was also among the variables examined with the intention of investigating the relationship between work experience and LBP. Fifty two (28.6%) respondents had work experience of 6 to 7 years followed by 19.5% employees with experience of 3 to 4 years. 30 employees have 11 years and more working with this institution. Employees with experience ranging from 8 to 10 years were 24 (13.2%) while those with 4 – 5 years' work experience are 18 (9.9%). Those who had worked for 1 to 2 years were 12.1%.

The majority of study respondents are nurses (44%), followed by Health attendants and doctors (18.7% and 14.3% respectively), while administration is represented by

12.1%. All employees were recruited in this study to draw experience they have on LBP. The large number of nurses in this study could be attributed to the fact that nurses comprise the largest group of staff in many hospitals since they are the ones who stay with patients for longer hours compared to other cadre in the health care sector. Health attendants also follow the path of nurses since they are also required to carry out as many activities in assisting and the general cleanliness of wards, and hospital environment at large.

4.4 Workers Knowledge of LBP among MOI Employees

This part presents the findings on staff knowledge of LBP, how LBP is being managed, as well as experiences of having LBP. An assessment of whether LBP can reduce performance of individual employee is also done. In this regard, respondents were asked if they experience LBP for a period of 5 days in their working environment. Their responses are presented in the following table.

Table 4.7: Experience of Low Back Pain

Response	Frequency	Percentage
Yes	65	35.7%
No	117	64.3%
Total	182	100%

Source: Researcher, 2014

As shown in the Table 4-7, 64.3% of study respondents experienced LBP within 5 days in their working environment while 35.7% had no experience of low back pain. These findings are impressive since the majority of study respondents reported a higher occurrence of low back pain within five days of their working environment. This demonstrates that low back pain is common among health workers and other populations at large.

Further analysis was done by cross tabulation between age and work experience in order to determine the age group with many respondents for further examination between gender and LBP. The findings are presented below.

Table 4.8: Cross Tabulation of Age by Work Experience

Age Group	Work experience (in years)						Total
	1-2	3-4	5 - 6	7-8	9-10	11 yrs and above	
18 to 23	8	2	4	0	0	0	14
24 to 29	19	6	2	0	3	0	30
30 to 35	3	2	33	6	1	8	53
36 to 41	0	0	7	4	18	6	35
42 to 47	0	0	8	13	5	4	30
48 and above	0	0	0	2	6	12	20
Total	30	10	54	25	33	30	182

Source: Researcher, 2014

As illustrated in Table 4-8, the majority of study respondents were within the age group between 30 to 35 years who had work experience ranging from 5 to 6 years followed by 18 respondents who are at the age between 36 and 41 years. Those with age group between 42 and 47 years had work experience between 7 and 8 years. This implies that age and years of work correlate as the length duration of work increases the age also increases, the longer the years of working the greater occupational exposure to low back pain. On the other hand increasing age has been associated with an increase in musculoskeletal symptoms. However, it has been stated that low back pain usually begins in early life, with highest frequency of symptoms occurring as the age range goes higher. These findings are in line with Jeffries et al (2007) who reported that prevalence of low back pain increases with

age and Hellerstein (1996) who also added that economic productivity decreases with age.

Moreover, in determining the gender and the occupation with of respondents reporting that they have LBP, cross tabulation was done and the findings are presented in the following table.

Table 4.9: Low back Pain Prevalence by Gender and Occupation

Department (Nature of work)	Gender				Total (n=117)
	Male		Female		
	Frequency	%	Frequency	%	
Nurses	16	13.6%	38	32.5%	54 (46.1%)
Gardeners	1	0.9%	1	0.9%	2 (1.8%)
Health Assistants	11	9.4%	14	11.9%	25 (21.3%)
Laboratory Technicians	2	1.7%	1	0.9%	3 (2.5%)
Radiographers	2	1.7%	1	0.9%	3 (2.5%)
Physiotherapists	3	2.5%	4	3.4%	7 (6%)
Administration	4	3.4%	11	9.4%	15 (12.8%)
Doctors	5	4.3%	3	2.5%	8 (6.9%)
Total	44	37.5%	73	62.4%	117 (100%)

Source: Researcher, 2014

As shown in Table 4.9, the majority of study respondents who had LBP are females, represented 62.4% of all respondents. The male counterparts with LBP are 44 (37.5%). Moreover, department wise nurses are presented by 54 (46.1%) followed by Health attendants who are 25 (21.3%) and administration group presented by 15 (12.8%) of all respondents who had LBP.

From these findings it is observed nurses stay for long hours with patients, lifting, ambulating patients who can't ambulate themselves. Health attendants also do heavy work, which also makes them vulnerable to experiencing LBP. Also, nurses and health attendants seems to be highly affected than any other group because their task in treating patients involve much stress and strains that arise from awkward posture since some of their tasks adopt and hold awkward postures as part of their work such as operating theatre nurses.

The findings also show that 21.8% of administrators have LBP. This could be due to their working style which involves sitting for long hours. These findings are in conformity with the study done in Ibadan, Nigeria by Sany and Omokhdoin (2002), who reported that office workers have severe back pain which is associated with sitting for more than three hours. The findings are also in line with Ponagiotis, et al., (2002) who did a cross section study among office workers in Greece, where they found a high prevalence of LBP.

Further analysis of MOI records revealed that among the patients going to the physiotherapy department with low back pain, on average, 60 MOI employees are attending per month (un-published data from MOI physiotherapy register book, 2014). Of these, 48 (80%) are females and 12 (20%) are males. Additionally, the cadre which is mostly affected are nurses followed by administrators. These findings tally with the aforementioned results projected in table 4.6.

4.4.1 Knowledge on Low Back Pain and management of LBP

Consideration was taken to examine how knowledgeable workers are about the management of LBP. E employees were asked how they are managing low back pain. Their answers are presented in the Table 4-10.

Table 4.10: Management of LBP among MOI Employees

Response	Frequency	Percentage
Poor	78	42.9%
Fair	46	25.3%
Good	50	27.4%
Excellent	8	4.4%
Total	182	100%

Source: Researcher, 2014

Data from table 4-10 indicates that majority (42.9%) had poor experience in managing LBP while 25.3% said they can manage LBP fairly. Few (4.4%) reported that they can manage LBP excellently. From the researcher's perspective, it is urgent action has to be taken since the majority of employees have poor knowledge of management of LBP. This could be detrimental to employees since without knowledge employees may injure their backs. In a study done by Cunningham et al., (2008) it was found that participants had good knowledge of managing back pain. This could probably be due to the emphasis placed on the important roles of managers reducing work related disability among workers.

Since the number of employees in the Institute who are suffering from low back pain is growing, MOI management and physiotherapists took the initiative to educate sufferers of LBP on how to manage their pain, and how the physical contributory factors to low back pain can be combated. In the nursing department, nurses are given two hours on Wednesday morning to train each on the burning issues which are detrimental to their work/health and their patients care at large. This goes hand to hand with reminding themselves of the ethics. Doctors are also holding daily morning presentations in which they also discuss their health.

4.5 Occupational-related physical activities that could contribute to employees LBP

This part explores the work-related and individual factors that contributed to the occurrence of low back pain (LBP) which affected work performance. Respondents were asked to mention occupational related activities that could contribute to LBP. The findings are presented below.

Table 4.11: Frequency Distribution of Physical Activities Contributing to LBP

Related activities	Frequency	Percentage
Lifting	49	26.9%
Standing and sitting for longer hours	56	30.8%
Stressful working hours	51	20%
Poor posture	36	19.8%
Heavy physical activities	29	15.9%
Bend to lift patient from floor to bed/item from floor level	59	32.4%
None of the above	1	0.5%
All of the above	68	37.4%
Total	182	100%

Source: Researcher, 2014

The data from Table 4-11 indicates that majority of the respondents know the causes of occupational-related physical activities that could contribute to LBP. The causes of LBP they mentioned include: bend to lift patient from floor to bed/item from floor level(32.4%), standing and sitting for longer hours (30.8%), stressful working hours (20.0%) and lifting (26.9%) and respectively). Other causes include poor posture as well as heavy physical activities.

During face to face interview respondents were also asked to mention causes of LBP and how these causes relate to their day to day activities. All study respondents

(n=182) reported they know causes of LBP and mentioned at least two causes. The most reported cause was bending, lifting as well as heavy work load. Others mentioned performing procedures like dressing while bending, bed making, working longer hours, sitting for longer hours, poor equipment as well as working environment. Furthermore, during probing, respondents were asked how these causes are related to their day to day activities. All respondents gave different reasons. Quoted herein are;

“The mentioned cause of LBP are related to my day to day activities since I am objected to perform my duties routinely and on daily basis”

“All causes I mentioned have positive relationship to my daily activities because I am performing lifting and pushing all the time with poor equipment and of course I am the sufferer of LBP most of the time”

The findings of this study are in line with Kaila-Kangas, , (2004) who reported that work related factors lead to lower back pain. In their study, they found that heavy workloads including night shifts and lifting are among the factors. These findings concur with the study by Yeung (2012) who found similar results. Turk and Okifuji (2004) also found stress, distress, mood and emotions, cognitive functioning, pain behaviour and depressive disorders among the cause of LBP. In addition, these findings are also in line with the study from Sanya and Ogwumike (2005) who reported that employees performing repetitive lifting, prolonged standing and sitting have high prevalence of acquiring LBP, and .that workers who to sit or stand for a long periods are at risk of LBP.

Jobs which require workers to sit or stand for a long period put them at risk of LBP. These findings are in compliance with the study review done by CDC (1997), which revealed that routine lifting of heavy objects, daily exposure to whole body vibration; work with neck in chronic flexion position or performing repetitive forceful task results to LBP. Omokhoidon (2000) also confirms this finding since

heavy physical work (45%); poor posture (20%) and prolonged standing or sitting (20%) was reported in his study.

The study by Nelson, Fragala, and Menzel (2003) also supports my findings regarding high prevalence of LBP among nurses. In their study, they found that nurses are being exposed to stressful conditions which might lead to LBP. The stressful work conditions include bathing a patient in bed; making an occupied bed; dressing a patient in bed; transferring a patient from bed to stretcher, wheelchair, or geriatrics chair; repositioning a patient in a chair; pulling a patient up to the head of the bed; and putting anti embolism stockings on a patient. Nurses may even develop LBP since nursing schools as all these tasks are done while they are training. I am also in support of Menzel. al., (2003) that most of clinical activities in nursing begin at schools where their task requiring lifting heavy patients, sustained awkward positions, and repeated stressful movements.

From these findings, it is well known facts that manual handling of loads, carrying out by one of more workers such as lifting, holding, pushing, pulling, carrying or moving loads can lead to low back pain. Awkward posture such as bending or twisting raised arms; bent repeatedly exertion can also cause pain to the back. Prolonged standing at the operating table in the operating theatre, which is often combined with a bent over or awkward position; lead to low back pain.

Current analysis of MOI staff records reveals that 60 employees are suffering from low back pain as presented in the table below.

Table 4.12: Current statistics at MOI showing Employees LBP

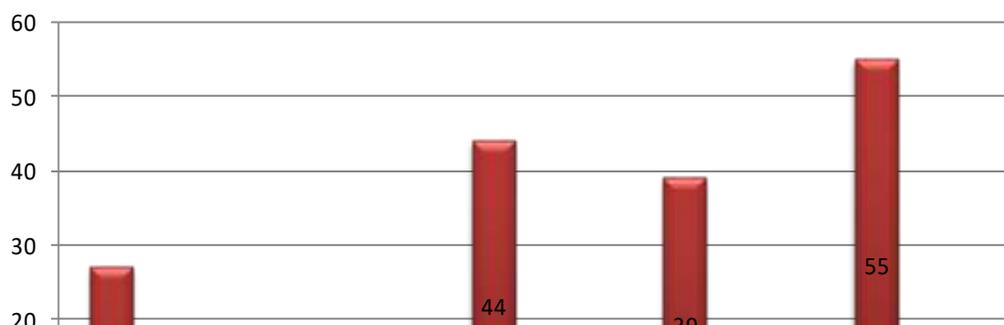
Department (Nature of work)	Gender				Total (n=60)
	Male		Female		
	Frequency	%	Frequency	%	
Nurses	8	13.3%	25	41.7%	33 (55%)
Health Assistants	4	6.7%	12	20%	16 (26.7%)
Doctors	3	5%	1	1.7%	4 (6.7%)
Administration	5	8.3%	2	3.3%	7 (11.6%)
Total	20	33.3%	40	66.7%	60 (100%)

Source: Researcher, 2014

Data from table 4-12 shows that among the staff members suffering from LBP, nurses are leading (55%), followed by health attendant (26.7%), administrators (11.6%) and doctors (6.7%) respectively. These findings concur with the study done by Omokhoidon (2000) where he found that highest prevalence of back pain (69%) was recorded among nursing staff, followed by administrative staff (55%) and cleaners/aides (47%).

Sickness absenteeism from work is an important indicator of LBP-related disability. Successful management of health-related lost labour time requires accurate measurement of lost productivity caused by health conditions in the workplace. Standardizing methods of sickness absence recording within and between various work sectors can allow the efficacy of various strategies to be compared.

Additionally, study respondents were asked to mention their lifting style, sitting style as well as how they lift an object from down- up. Their results are presented in Figure 4.1.



Source: Researcher, 2014

Figure 4.1: Sitting Style

Figure 4.1 above illustrates lifting style of study respondents. Thirty percent (30.2%) of the study's respondents reported to have no problem in lifting 24.2% can lift only light weight objects. Study also revealed that 21.4% cannot lift heavy weight from the floor. Others reported that they can't lift heavy objects or lift anything at all (14.8% and 9.3% respectively). From researcher's view, these findings have some huge implications since its consequences can lead to absenteeism from work, which is very costly to the institution and country at large in terms of economy. This is in support of the study done by Maniadakis and Gray (2000) that LBP is associated with major costs in terms of health usage and absenteeism.

Furthermore, respondents were asked on how their sitting style is and their response is shown in the following table.

Table 4.13: Responses on Sitting Style

Response	Frequency	Percentage
I can't sit due to pain I have	8	4%
I can sit only in my favourite style	102	56%
Sitting is impossible for me for more than 30 minutes	10	5.5%
Pain prevents me from sitting	12	6.6%
I do not have pain in sitting	50	27.5%
Total	182	100%

Source: Researcher, 2014

As portrayed in Table 4-13, 102 (56.0%) reported that they can only sit in their favourite style while 50 (27.5%) reported no pain in sitting. Others reported that pain prevents them from sitting, while some said sitting is impossible for more than 30 minutes. In view of the above findings, 56.0% do seat according to their favourite style. This means that they might have a different style of sitting.

Consideration was also given on the lifting style, with special attention to lifting an object from down-up. In daily activities, people do a lot of activities involving lifting objects, be it heavy or light objects. Figure 4.2 below presents the findings of lifting an object from down- up.

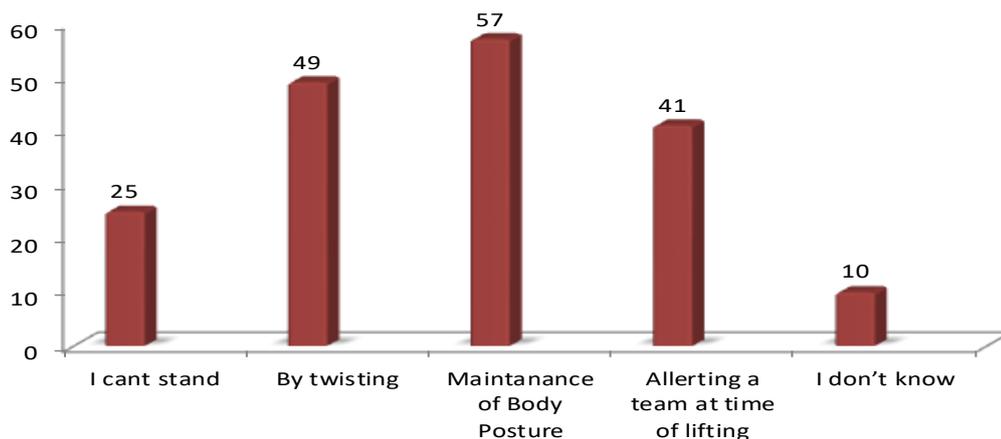


Figure 4.2 Lifting an object from down-up

Fifty-seven 57 (31.3%) of the respondents are lifting objects from down-up by Maintaining body posture, 49 (26.9%) respondents are doing it by twisting while 41 (22.5%) respondents are alerting the team. On the same note, 25 (13.7%) of study respondents cannot even stand during lifting and 10 (5.5%) don't know how to lift an object from down-up.

Furthermore, during face to face interview respondents were asked the same question and their answers were a bit different from the findings answered in self-administered questionnaire. Surprisingly, all study participants in this study responded to this question even those who did not know the answer in the questionnaire, as illustrated in table 4-14.

Table 4.14: Face to Face Response on Lifting Object From Down - Up

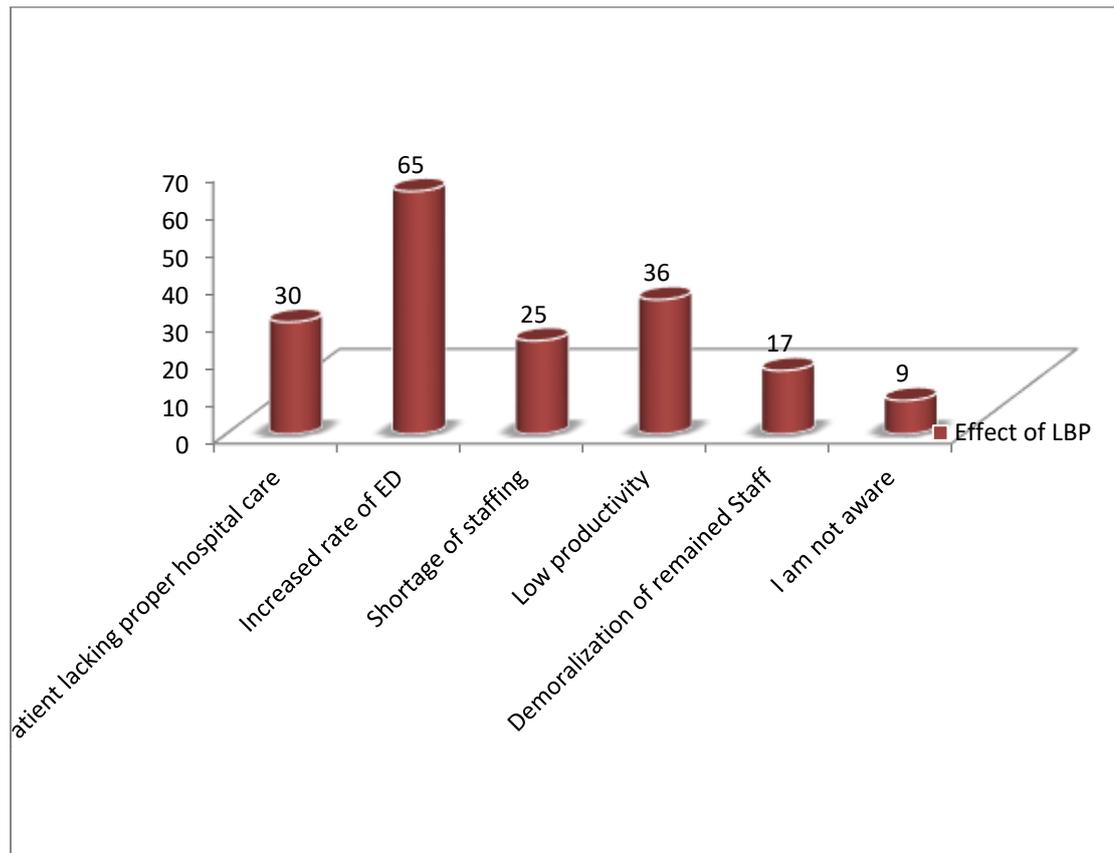
Lifting style	Frequency	Percentage
Bend down and take a required object	79	43.4%
Put back straight when bending, knees should be bent and not the back	45	24.7%
Call people to lift object	35	19.2%
Both knees put together and bend to take the object	23	12.6%
Total	182	100%

Source: Researcher, 2014

As shown in the Figure 4-2 and Table 4-14 above, lifting an object from down-up is a problem, 79 (43.4%) reported that in lifting object from down-up one has to bend down and take the required object, 24.7% said one has to put back straight when bending and knees should be bent and not the back.

4.4 Effect of Work Related LBP

The effect of work related LBP was also explored. Employees were asked what the effects of work related low back pain are. Their answers are expressed in the Figure 4.3



Source: Researcher, 2014

Figure 4.3: Effects of Work Related LBP

As shown in the figure above, 65 (35.7%) reported increased rate of excuse from duty while 36 (19.8%) reported low productivity. Furthermore, shortage of staff as well as demoralization of remaining staff is also noted (13.7% and 9.3% respectively). Patients' lacking proper hospital care was also reported while some respondents indicated that they were not aware of the effect of low back pain (16.5% and 4.9% respectively).

Further analysis was done to explore how many employees with low back pain attend physiotherapy sessions on a daily, weekly and finally on a monthly basis. The findings reveal that 5 employees being seen on staff sessions on average. There is three (3) sessions, so this makes 15 patients a week and 60 patients a month are treated. Among these, some are given exemption of duties (ED); others are given light duties to avoid carrying and lifting heavy objects.

These findings are similar to those from a study done by Maniadakis and Gray (2000) which associated LBP with major costs in terms of health usage and absenteeism (excuse from duty). In line with that is the study done by Tsebin et al. (2002) which also found that LBP decreases labour productivity due to time taken off work, absenteeism as well as early retirement. Generally, low back pain poses an economic burden to society in terms of the large number of work days lost while an employee is on Excuse Duty (ED).

4.5 Prevention strategies that Could Reduce LBP among Employees

This part presents the findings on ways/strategies that could be used to reduce occurrences of LBP, as perceived by employees. This aspect assesses how employees are aware of the causes as well as the means to prevent them. The findings are presented in the table below.

Table 4.15: Ways/Strategies that Could Be Used to Reduce Occurrences of LBP

Strategy	Frequency	Percentage
Health training programme	44	24.2%
Regular exercising	33	18.1%
Following instruction of how to maintain posture	42	23.1%
Flexitime to employees	53	29.1%
Routine education of how to lift and turn patients	68	37.4%
Having all the required equipment and abide with them	72	39.6%

Source: Researcher, 2014

39.6% reported that having all the required equipment and abiding with them may reduce LBP; 29.1% were in opinion of having flexitime to all employees and 23.1% indicated following the instructions of how posture is maintained. During face to face interviews, study respondents were also asked for their views on how LBP can be prevented. The following table represents their views.

Table 4.16: Face to face Interview on LBP Prevention

Strategy	Frequency	Percentage
Provision of standard requirements	60	33%
Train people on body posture management	56	30.8%
Rotating employees who has the same nature of work as being stationary in one place may increase LBP	77	42.3%
Giving break time to employees to ease themselves	58	31.9%
Employ new staff to manage the available work rather than leave the heavy work to few employees	65	35.7%

Source: Researcher, 2014

The findings from the face to face interviews reveal that 42.3% think that rotation of employees who have the same nature of work could reduce LBP rather than staying stationary at one place, while 35.7% reported that LBP can be reduced by employing new staff to manage the available work rather than leaving heavy work to few employees. Other views were:

- (i) Provision of standard equipment (33.0%)
- (ii) Giving break time to employees to ease themselves (31.9%)
- (iii) Training on posture management (30.8%).

The strategies/ways reported in this study are consistent with the strategies reported by CDC (1997) such as changing how products can be transported as well as patient lifting. According to CDC, lifting mechanical devices should be used during heavy-load lifting in order to reduce manual work. The use of adjustable workbenches can

also reduce occurrences of LBP among employees who are working with workstation involving sitting for longer hours.

Another strategy mentioned in this study (which complies with the CDC strategies) was health programmes (24.2%) and education (37.4%) in order to reduce LBP. According to CDC, training programmes which focus on general ergonomics awareness are vital. These include training on lifting and lowering, pushing and carrying, risk factors such as posture as well as vibration which should be imparted to employees (CDC, 1997).

Additionally, flexitime is mentioned in this study and it conforms to CDC (1997) strategies in reducing LBP. According to CDC, this is manageable when employees are given time to shift schedule such as coming earlier or later, taking a lunch break at an alternative time. In reality the following work conditions prevent low back pain:

- (i) Reducing shift length or limiting overtime
- (ii) Scheduling more breaks to allow rest and recovery
- (iii) Rotating workers through several jobs with different physical demands to reduce stress on the body
- (iv) Adjusting the pace of work to relieve repetitive motion risks, and
- (v) Increase worker control of the work process.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter provides the general conclusion on how low back pain is caused by different factors, and the recommendations on how occurrences of low back pain can be reduced.

5.1 Conclusion

In conclusion, low back pain has been indicated to be the most prevalent occupation-related problem in both the developed and developing world. Health care workers in the developed world may be working under improved working conditions, which may not be case under for workers in most African countries. Therefore, health care workers and other supportive staff in Africa, particularly in Tanzania where the study was conducted, might be at higher risk of suffering low back pain than other workers in industrialized countries. This is due to the increased risk of work related injuries and thus a reason for concern. The results of the current study will hopefully contribute to the scanty information available in Africa. It is apparent that the prevalence of LBP among Africans may be comparable to that reported in research undertaken in developed nations. Therefore further research into the identification, prevention and best practice management of LBP is also necessary in African countries.

Low back pain is one of the most common musculoskeletal conditions in the general population. The burden of LBP is enormous in terms of quality of life, productivity, and employee absenteeism; making this common condition the single largest contributor to musculoskeletal disability worldwide. In this study, it is confirmed that factors such as age, awkward posture, sitting and standing for longer hour's style, lifting as well as twisting caused of low back pain among MOI employees. The findings confirm the need for preventive measures on the working environment and working posture for LBP reduction and health promotion generally.

Furthermore, more attention should be paid to other factors such as lifting style as well as body posture maintenance. Body mechanics should be practiced in the hospital environment, especially during simple or complicated treatment procedures to alleviate back pain.

In conclusion, this study sought to assess the occurrence of Low Back Pain in relation to work performance among employees at Muhimbili Orthopaedic Institute. Indeed, the findings revealed that there is poor practice of body mechanics even though some study respondents know the importance of this practice. Therefore, employees' perceptions about practice of body mechanics imply that education should be delivered to them as a way of reducing occurrences of LBP. At the same time, the practice of body mechanics should also be done to facilitate treatment.

It is of great importance for the employers and policy makers to be watch-dogs to make sure that environmental factors which contribute to low back pain can be minimized as much as possible. Secondly, health education on LBP is provided to all employees within the hospital environment. Other African-specific factors such as the HIV and AIDS epidemic, types of work tasks and poor nutrition may also influence LBP prevalence among Africans. This should be a motivating factor for policies to be enacted at community and national levels to ensure measures are put in place to combat and reduce the occurrence of LBP.

5.2 Recommendations

Based on the research conducted; the following are recommended:

(i) Education/Training

This plays a vital role as a part of a general prevention of low back pain or reduction of the risk factors that can cause low back pain to employees. Since lifting has been reported as the cause of low back pain among MOI employees, is it wise that all employees should be trained on how lifting, sitting, standing and posture maintenance is supposed to be done. For administrators, the use of proper chairs which put the back straight, and the use of foot-rests is vital to support the back.

Principally, elimination or reduction of lifting or other types of physical ‘overload’ on the body should be the first priority for prevention of work related to low back pain. Through this study, I was able to identify the actual situations and the implications of body mechanics practice. Therefore, reduction of high exposure to the repetitive lifting is paramount to reducing the number of Low back pain sufferers and work absenteeism.

(ii) Changing Organizational Design by Doing Job Rotation is Also Recommended

This is achieved by moving workers from one location to another in a well-prepared timetable. Changing organizational design is a common practice. It involves moving workers from station to station or to change tasks within one station every two hours for example. Job rotation is used for variety of reasons. The first reason is to increase motivation. The second reason is to train a versatile work force to reduce fatigue and the risk of musculoskeletal disorders.

(iii) Introducing fitness programs and providing advice to MOI employees stay active to reduce pain low back pain.

(iv) Furthermore

The hospital must provide posters showing body mechanics such as lifting patients and the way that nurses change bed sheets. Overall, the nurses should become more concerned about the use of body mechanics while performing these procedures.

(v) Last but not Least

The hospital must reduce all the known risk factors that might cause low back pain. Physical factors, socioeconomic factors as well as psychological factors to LBP must all be considered.

Individuals should also in general follow the following recommendations to prevent and or reduce incidents of LBP:

(i) Always stretch before exercise or other strenuous physical activity.

- (ii) Don't slouch when standing or sitting. When standing, keep your weight balanced on your feet. Your back supports weight most easily when curvature is reduced.
- (iii) At home or work, make sure your work surface is at a comfortable height for you.
- (iv) Sit in a chair with good lumbar support and proper position and height for the task. Keep your shoulders back. Switch sitting positions often and periodically walk around the office or gently stretch muscles to relieve tension. A pillow or rolled-up towel placed behind the small of your back can provide some lumbar support. If you must sit for a long period of time, rest your feet on a low stool or a stack of books.
- (v) Wear comfortable, low-heeled shoes.
- (vi) Sleep on your side to reduce any curve in your spine. Always sleep on a firm surface.
- (vii) Ask for help when transferring an ill or injured family member from a reclining to a sitting position or when moving the patient from a chair to a bed.
- (viii) Don't try to lift objects too heavy for you. Lift with your knees, pull in your stomach muscles, and keep your head down and in line with your straight back. Keep the object close to your body. Do not twist when lifting.
- (ix) Maintain proper nutrition and diet to reduce and prevent excessive weight, especially weight around the waistline that taxes lower back muscles. A diet with sufficient daily intake of calcium, phosphorus, and vitamin D helps to promote new bone growth.
- (x) If you smoke, quit. Smoking reduces blood flow to the lower spine and causes the spinal discs to degenerate.

There should be further research on the duration, severity, and disability over the course of low back pain as it is apparent that with the expanding and aging populations in many low-income and middle-income countries, an enormous burden from low back pain in these areas will grow significantly over coming decades arguably affecting work places in terms of positive productivity in the workplace.

Other research has tried to determine what interventions may be effective to treat low back pain, whether acute or chronic in nature. Patient (client) education, medication, physical, chiropractic and osteopathic therapies, guided exercises, mechanical devices, dietary and lifestyle advice, acupuncture and psychological interventions are commonly used to provide pain relief for low back pain sufferers. Workers and employers need to be better informed about the risks. There needs to be a better understanding of the burden that should lead to better prevention of back pain and injury, as well as decreased lost work time due to back pain. Indeed strength of this study is the defining and realization of the effect and extent of LBP cases in the health sector not only worldwide, but with a focus on Tanzania (MOI).

According to researchers, there is a clear need for additional research on the natural history of LBP. As ageing populations expand and are on the increase, in many low-income and middle-income countries, the burden from LBP in these areas will grow significantly over coming decades. It is, therefore, imperative that we aim to increase our understanding of, and attempt to mitigate the growing burden of LBP in our societies and respective geographic jurisdictions.

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APPENDICES

Appendix I: Informed Consent Form

I am Flora Swai, a Postgraduate student at Mzumbe University – Dar es Salaam Campus. I am doing a research with the aim of identifying the occurrence of low back pain in relation to work performance among public health employees. If you agree to participate in this study, you will be asked to administer the questionnaire then face to face interview will follow to obtain more information from you.

No information from this study will be available to unauthorized individuals. All information will be kept with utmost confidentiality and only code numbers will be used, no name is used for any identification. Don't expect any harm from this study to happen to you. Taking part in this study is completely voluntary. You can withdraw any time without giving reasons, even if you have already given consent. If you have any other questions regarding this study, feel free to contact me, the investigator, Ms. Flora Swai through telephone number + 255 (0) 655 662 266

Do you agree to participate? (*Tick the response*)

(i.) Yes

(ii.) No.....

Appendix 2: Self Administered Questionnaire

Instruction

1. Please answer all the questions.
2. Select by putting a tick in the box or circle to the response that corresponds.

SECTION A:BIODATA.

1. Age in years

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2. What is your Gender

Male	1
Female	2

3. Marital Status

Single	1
Married	2
Divorced	3

4. What is your Work Experience?

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5. Highest level of education

Primary Education	1
Secondary Education – O Level	2
Secondary Education – A Level	3
Post Education	4

6. Knowledge of Managing Low Back pain

Poor	1
Fair	2
Good	3
Excellent	4

7. Have you ever experience pain in your back continuously for a period of 5 days in your working environment?

YES	1
NO	2

8. What is the attitude of employees toward LBP?

NEGATIVE	1
POSITIVE	2

10. What do you think is the occupational related physical activities that could contribute to LBP?

Lifting	1
Stressful working hours	2
Standing and sitting for longer hours	3
Environmental factors (work procedure, equipment,	4
All of the above	5
None of the above	6

SECTION B: SPECIFIC INFORMATION

11. Do you have pain in one or both legs?

YES	1
NO	2

12. What is your sitting style?

I can't seat due to pain I have	1
I can seat only in my favourite chair	2
Sitting is impossible for more than 30 minutes	3
Pain prevents me from sitting	4

13. What is your standing style?

I can't stand	1
I feel pain on standing	2
I can't stand for more than one hour	3
Pain is severe at the moment	4

14. What is your lifting style?

I can't lift heavy weight object	1
Only light weight can be lifted	2
I cannot lift or carry anything at all	3
I cannot lift heavy weight from the floor unless they place up a bit	4

15. How do you lift an object from down - up?

By bending	1
By twisting	2
Maintenance of body posture	3
Alerting a team at time of lifting	4

16. What do you consider the effect of work related low back pain?

Patients are lacking proper hospital care (For Nurses ONLY)	1
Increased rate of ED	2
Low productivity	3
Shortage of staffing	4
Demoralization of remained staff	5
Exchange of job	6

17. What ways/strategies could be used to reduce occurrences of LBP?

Following instructions on how to maintain posture	1
Routine education of how to lift and turning patients	2
Health Training program	3
Having all the required equipment and abide with them	4
Regular exercising	5
Flexitime to employees	6

Appendix 3: Interview Guide Questions

QUESTION ONE: What do you think is the cause of low back pain among employees?

Probe in: *How is it relating to you day to day activities?*

QUESTION TWO: Do you think LBP can reduce performance of individual employee?

Probe in: *How?*

QUESTION THREE: How can the low back pain be prevented or reduced at work places with the urge of increasing employee performance.

QUESTION FOUR: Do you have knowledge of lifting heavy object/lifting a patient?

QUESTION FIVE: What other factors do you think increase LBP?

QUESTION SIX: Have you ever experience LBP and failed to attend your day to day? How many days have you taken off due to LBP?