

**THE IMPACT OF MUSCULOSKELETAL DISORDERS ON  
ABSENTEEISM IN HOSPITAL WORKERS IN THE  
MANGAUNG METROPOLITAN DISTRICT**

by

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**BLOEMFONTEIN**

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**20 November 2014**

## **DECLARATION**

I declare that the Field Study hereby submitted for the Magister in Business Administration at the UFS Business School, University of the Free State, is my own independent work and that I have not previously submitted this work, either as a whole or in part, for a qualification at another university or at another faculty at this university.

I also hereby cede copyright of this work to the University of the Free State.

**P.T. Qhomane-Mhlanga**

**20 November 2014**

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## **ABSTRACT**

The study was prompted by the high rate of absenteeism among the personnel at hospitals within the Margaung Metropolitan District, which has a negative impact on services provided to the patients. The primary objective was to examine the extent to which the musculoskeletal disorders, due to poor ergonomic environment, contribute to absenteeism.

A quantitative cross-sectional design was used in this study, to determine the relationship between the prevalence, the level of discomfort of musculoskeletal disorders, and the ability to work. Data was collected using an adapted Cornell Musculoskeletal Discomfort Questionnaire (CMDQ), and analysed using the chi-square test.

The results show a high prevalence of musculoskeletal disorders of the neck, shoulders, upper back and lower back. The pain in these areas was mostly moderate, but those who indicated unbearable pain also indicated substantial interference with ability to carry out their duties. On the lower peripheral joints, the prevalence was high for the feet, followed by the knees and the hips. The feet had a higher level of discomfort leading to substantial interference to carry out duties than the knees and hips. The chi-square tests indicated significant relationship between the level of discomfort due to pain of musculoskeletal nature and the interference to work for neck, shoulders, upper back, lower back hips and feet. Thus the level of discomfort in these areas significantly contribute to absenteeism. With the rest of the body parts, there was no significant relationship as the p-value is greater than 0.1. The observations indicated postures and ergonomics which posed a risk for musculoskeletal disorders.

**Keywords:** *musculoskeletal disorders, ergonomics, absenteeism, healthcare workers.*

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## **CHAPTER 1**

### **INTRODUCTION AND PROBLEM STATEMENT**

#### **1.1 INTRODUCTION**

Mangaung Metropolitan District (MMD) is one of the four districts of the Free State province, and the only district classified as metropolitan. The district comprises Bloemfontein, Botshabelo and Thaba 'Nchu, and it has a population of 747 431 with a population growth rate of approximately 1.47% per annum (FSDoH 5-year strategic Plan 2010/11 to 2014/15:5). The Free State Department of Health (FSDoH) serves the above-mentioned towns. The FSDoH has six hospitals, namely Universitas and Pelonomi Academic Hospitals, Free State Psychiatric Complex, National Hospital, Botshabelo District Hospital and Dr JS Moroka District Hospital in Thaba 'Nchu. These hospitals serve the population in the district and the border areas such as Thabo Mofutsanyana, Xhariep and Lejweleputswa districts. The District Health Plan (DHP) (2013:9) further indicates that the MMD has experienced a significant growth in head counts at the clinic facilities and the hospitals' out-patients departments as a result of the growth in population. Informal settlements comprise about 44% of the MMD, and, together with part of the emerging middle class, depend on public health care. Therefore, the pressure on the services has become a serious concern.

The 5-year Strategic Plan and the DHP state that the key activities for improvement of infrastructure availability are the expansion of the facilities to accommodate more beds, building new facilities and buying appropriate equipment. Improvement of working areas to prevent occupational injuries which lead to absenteeism is evident. Improving human resources will be achieved by training more clinical staff and appointing more of them at facilities (FSDoH 5-year Strategic Plan, 2010).

For the past ten years, the patient load had increased while the infrastructure and the human resources did not increase at the same pace. One of the challenges identified is poor maintenance of facilities and equipment (FSDoH 5-year strategic Plan 2010/11to 2014/15:10). When the infrastructure is not appropriate in terms of

the working space and the equipment is not of acceptable standard, the employees are exposed to altered ergonomics. These factors have an indirect result of high rates of absenteeism. Absenteeism threatens effective service delivery and leads to the collapse of health care services. It is therefore, imperative to determine the factors contributing to the high rate of absenteeism in order to effectively manage absenteeism (Kahya, 2007:518-519).

This chapter highlights the problem statement as well as the objectives. Research structure, methodology and design are explained. A preliminary literature review was conducted to conceptualise the variables. Ethical considerations and possible limitations are explained. The study was conducted at Botshabelo District Hospital. The sample comprised of the management staff, clinical, maintenance and support staff.

## **1.1 PROBLEM STATEMENT**

The government of the Republic of South Africa agreed on 12 key outcomes in the Negotiated Service Delivery Agreement (NSDA), as the key indicators for the Programme of Action for 2010-2014. Outcome 2 is discussed in this research. The outcome is provision of “Long and Healthy Life for All South Africans”. The Free State Department of Health has derived its vision of “A long and Healthy Life for the Free State Community” from Outcome 2 of the NSDA. The health sector has four outputs which must be achieved in order to accomplish the vision. These outcomes are to increase life expectancy, decrease maternal and child mortality, decrease the burden of diseases with the focus on Tuberculosis and HIV/AIDS, and to strengthen the effectiveness of the health care system. (NSDA 2010:4).

The Mangaung Metropolitan District has developed a District Health Plan (DHP), which is aligned to the 5-year FSDoH Strategic Plan, to address the Millennium Development Goals, the Six Ministerial Priorities (among which cleanliness of the health facilities. This was born out of the appalling condition of state hospitals with regard to cleanliness) and to ensure the achievement of the desired outputs. One of the strategic goals of the DHP is strengthening the health system effectiveness by means of:

- Re-engineering the primary health care system.
  - Improving patient care and satisfaction.
  - Accreditation of health facilities for compliance.
  - Improving infra-structure availability.
  - Improving human resources.
  - Strengthening financial management.
  - Improving health care financing through the implementation of national health insurance.
  - Strengthening the health information management systems.
- (DHP, 2013:12).

The FSDoH acknowledges that there are human resources challenges which negatively affect the achievement of the above outcomes. The challenges include inadequate performance management of clinical and non-clinical personnel, and a high rate of absenteeism (FSDoH Annual Performance Plan 2013/2014:10).

A high rate of absenteeism among the personnel at hospitals within the Mangaung Metropolitan District has a negative impact on efficiency. Therefore, it is necessary to examine the extent to which the musculoskeletal disorders due to poor ergonomic environment contribute to absenteeism, thus hindering effective service delivery.

## **1.2 RESEARCH OBJECTIVES**

The research objectives, both primary and secondary, are as follows:

### **1.2.1 Primary objective**

- To determine the impact of musculoskeletal disorders on absenteeism among healthcare workers at Botshabelo District Hospital, in the Mangaung Metropolitan District.

### **1.2.2 Secondary objectives**

- Determine the prevalence of musculoskeletal injuries.

- Determine the impact of musculoskeletal pain on the ability to work at Botshabelo District Hospital.
- Assess physical working conditions (ergonomics) at Botshabelo District Hospital.

### **1.3 TERMS USED**

Absenteeism: absence from work.

Ergonomics the fit between body control and the working environment.

Healthcare worker worker in a hospital setting. For this study, it refers to all hospital personnel: nursing, clinical, cleaning, maintenance and support personnel.

Musculoskeletal disorders (MSD): aches and pain in the muscles and joints.

Physical working environment: building structure, equipment and furniture.

### **1.4 RESEARCH DESIGN**

A quantitative research strategy was used to test theories in order to deduce a relationship between theory and research (Bryman & Bell, 2007:154). The theoretical predictions were tested with precise measures of variables. There might be one or more dependent and independent variables to be examined. The quantitative data was gathered and analysed using statistical methods (Tharenou, Donohue & Cooper, 2007:16-18).

### **1.5 SAMPLING DESIGN**

A sample refers to the part of the population selected for the research. In this research probability sampling was used. This technique involved selection of the sample using random selection so that each unit of the population has an equal and known chance of being selected (Bryman & Bell, 2007:182). A stratified random sampling was the choice of sampling to be employed to ensure

representation of the chosen population. This choice of sampling became feasible because there was a list or information readily available to identify members of the population in terms of stratifying criteria (Bryman & Bell, 2007:188). The number of nurses to take part in the research was determined using the absenteeism records of nurses on sick leave supplied by the human resources sections of the identified hospitals.

## **1.6 DATA COLLECTION**

Structured questionnaires based on reliable ergonomics measurement tools were used to identify the fit between the type of work the nurses do, the environment and resources available. The information on physical exposures is included where subjects were asked to give information on their specific work situations and the estimated working time in those situations.

Data on absenteeism was obtained from human resources records of nurses on sick leave. Data was also obtained from the occupational health clinics in the hospitals on the reported illness due to MSD. These sets of data provided objective data for the study.

An association between poor ergonomics (independent variable) and absenteeism (dependent variable) was established. Control variables such as age, gender, and educational level, were also measured since they might have an impact on the dependent variable (Tharenou et al., 2007:46-48).

To ensure reliability of the study, it is based on an extensive literature review to determine theory/theories which give a systematic view of the relationship among the variables in order to provide the rationale for the occurrence of absenteeism (Tharenou et al., 2007:46-48).

## **1.7 DATA ANALYSIS**

A multivariate technique was employed because the relationship between the independent and the dependent variable needed to be assessed, and also to take the control variables into consideration (Tharenou et al., 2007:191-192).

The data was coded to classify phenomena. These codes were then analysed using the SPSS software programme (Bryman & Bell, 2007:310-312).

## **1.8 RESEARCH ETHICS**

Ethical considerations were observed in line with the requirements of the University of Free State and the Free State Department of Health.

Participants were provided with information letters clearly stating the purpose of the study, without giving false expectations regarding the research outcomes. They were requested to give individual informed written consent in the language of their choice. They could also choose not to enrol in the study.

Anonymity was ensured throughout and after the study: Completed questionnaires do not include personal information of participants and comments made in focus group discussions are not attributable to a particular individual by name. Data security is guaranteed.

## **1.9 CONCLUSION**

The FSDoH has undertaken an organisational restructuring that is directed to refurbish infrastructure and improve infrastructure maintenance in order to ensure accessibility to clients and better working conditions for employees. It is clear from the literature review that adapting the workplace and educating personnel on ergonomics for optimal performance, is an investment that will yield substantial returns in terms of productivity and reduced absenteeism

Managers are often under the impression that the compensation of employees is proportional to the level of performance and motivation. But this has a limited short-term effect, while the workplace environment in terms of physical environment and design can affect employee behaviour (Leblebici, 2012:39).

## **1.10 DEMARCATION OF THE STUDY**

**Chapter 1:** Research proposal which gives an overview of the complete research.

**Chapter 2:** Literature review which discusses relevant theories and argues the significance of the research.

**Chapter 3:** This chapter gives a detailed description of the research method used to collect data and ensure validity.

**Chapter 4:** Data analysis to prove or disprove the theories and answer the research problem was presented.

**Chapter 5:** Following the data analysis, limitations and recommendations were discussed, and a conclusion formulated.



## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

The chapter aims to orientate the reader with regard to the topic. It provides an overview of the importance of ergonomics and posture in development of musculoskeletal disorders, and how these contribute to absenteeism. The importance of ergonomics in prevention of musculoskeletal disorders are also discussed, as a way of reducing absenteeism.

#### **2.2 ERGONOMICS**

The word 'ergonomics' is derived from the Greek words 'ergon', meaning work and 'nomos, meaning law. Sometimes the term 'human factors' is used instead of ergonomics. Ergonomics is a scientific discipline concerned with understanding of the interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design, in order to optimise human well-being and overall system performance (Dul & Weerdmeester, 2001:1).

The focus of ergonomics is man, in the design of work and everyday life situations. Ergonomics is the scientific study of how people interact with their work environment. The goal of ergonomics is to ensure appropriate fit of the working environment and the people, thus reducing stress, eliminating injuries and disorders resulting from bad posture, overuse of muscles, and repeated tasks. To achieve this, work spaces and tasks should be designed to fit the worker's physical capabilities and limitations. The physical and psychological capabilities and limitations of humans are taken into account to avoid situations which are uncomfortable, unsafe, unhealthy or inefficient at work or in everyday life. Factors which play a role in ergonomics include body posture and movement which comprise sitting, lifting, pulling and pushing; environmental factors comprising noise, vibration, illumination, climate, and chemical substances; information and operation which include information gained visually or through other senses; and

work organisation comprising appropriate tasks. These human factors show the interdisciplinary nature of ergonomics in approach and application, the consequence of which is adaptation of the workplace or the environment to fit the people rather than the other way round (European Agency for Safety and Health at Work 2009:12-13).

In their research, Franche, Murray, Ostry, Ratner, Wagner and Harder (2010:7) found that rates of work place injuries were very high in rural health care workers, which were mostly musculoskeletal injuries (MSI) among nurses. Low back pain was the most common disorder with prevalence of about 60% to 83%. Rural health care workers were found to have higher incidents of MSI and longer average absence from work than their urban counterparts. The associated workplace risk factors included long working hours coupled with high physical demands. A Canadian study found that health care workers, especially nursing personnel, have greater risk of workplace injuries than many other occupational groups as a result of exposure to poor ergonomics associated with patient care. High work demands, equipment and environmental inadequacies cause MSD (Yassi, et al. 2005:333). This fact was also stated in the study by the European Agency for Safety and Health at Work (2009:32-33), which focused on health and safety of cleaning personnel. This study indicated that it was evident that physical hazards which usually contribute to MSD, for example falls, and moving machinery and furniture, contributed to absenteeism.

Whenever workers are subjected to a continuous motion without proper workstation design, they run the risk of developing repetitive stress injuries or musculoskeletal disorders (MSDs). MSDs are defined as continuous motion disorders caused by continuous and repetitive movement of the body. MSDs include headaches, back pain, neck pain, joint pain and nerve damage. These disorders account for about 40 percent of annual workplace illness and cost the companies several millions. The chief means of reducing injury incidents in the workplace is application of ergonomics (DeCenzo, Robbins & Verhulst, 2013:345-346).

Ergonomics involves fitting the work environment to the individual. Employees differ in shape, size, height, and capability. Expecting each employee to adjust to standard furnishings is impractical. Instead, recognising and acting on these differences, ergonomics looks at customising the work environment until it is not only conducive to productivity but keeps the employee healthy (DeCenzo, Robbins & Verhulst: 2013:345-346). Ensuring an appropriate fit of the workspace and the environment to the person is vital in avoiding accidents and inefficiency at work. However, one of the problems in applying ergonomic principles to work situations is that it is often seen as merely exercising common sense. This appears to be true, with the benefit of hindsight, and it is frustrating to notice how little, or even no consideration is given to the human component in many work systems (McKeon & Twiss, 2004:7).

Many work and everyday life situations may be hazardous to health. In many workplaces, musculoskeletal and psychological illnesses are the major cause of absence due to illness. This is ascribed to poor design of tasks, workspaces and equipment. It is in this regard that ergonomics can help to reduce the problems, and to a considerable degree, enhance performance by improving the working conditions. Improving the working conditions begins with description of the tasks to be performed and allocation to people. The tasks then have to be combined into jobs to ensure that each person is able to complete the work, has control over it, has the ability to determine the method and the sequence of operations, that is able to ensure that light and heavy tasks are alternated (COMCARE 2010:16-24).

The tasks which people perform at work and generally in life involve posture and movement, and these play a central role in ergonomics. The body's muscles, ligaments and joints are involved in adopting a posture, carrying out movement and applying force. The muscles provide the force necessary to adopt a posture or make a movement. The ligaments have an auxiliary function, while the joints allow the relative movement of the various parts of the body (Dul & Weerdmeester, 2001:6).

Workers will commonly adopt a posture which is dictated by the design of their workstation or equipment. Such postures are not necessarily comfortable or the least fatiguing. Poor posture and movement can lead to mechanical stress on muscles, ligaments and joints (musculoskeletal system), resulting in complaints of the neck, back, and other parts of the musculoskeletal system (Helander, 2006:170,179; McKeon & Twiss, 2004:11).

### **2.2.1 The importance of ergonomics**

To incorporate ergonomics in the workplace, the first process should be to identify or predict ergonomic problems through observation, user trials, discussion groups, accidents and ill health reviews, and performance problems. Next, the relative significance of the problems should be evaluated. Following evaluation, remedies to rectify the ergonomic problems should be recommended to management (McKeon & Twiss, 2004:7-8).

In the study by Hal (2008:420) it was noted that management usually do not understand how poor ergonomic conditions can decrease productivity. The workers usually adapt to the conditions and do not complain; but the cost is increased production time, lower quality and increased rate of injury. When doing a job and the body is stressed by an awkward posture or repeated movements, the musculoskeletal system becomes affected and begins to present the symptoms of pain, discomfort and fatigue, indicating the onset of musculoskeletal disorders. These conditions develop progressively or occur immediately due to sudden overload. Ergonomic improvements in the workplace can be undertaken to enhance productivity and safety of the workers, decrease pain and discomfort, improve morale, and reduce absenteeism. Yassi, Gilbert, and Cvitkovich (2005:336) have also found that MSDs comprise the majority of healthcare sector time loss claims in every province in Canada, primarily occurring during direct patient care activities. Thus, ergonomic improvements to reduce and prevent MSDs enhance productivity and return on investment.

People who do labour intensive work require physical strength, correct posture and ergonomics, otherwise MSD will be the consequence. According to Circadian,

2005:2 and Leblebici, 2012:39, extensive scientific research suggest that improving the working environment and health of employees results in reduced number of complaints and absenteeism by one-third, as two-thirds of absenteeism is due to other reasons than sickness. Research by Kahya, 2007:516-517 showed that there was significant correlation between physical environment and performance indicators ( $r=0.234$ ). Organisations with environmental problems had more performance problems such as low productivity and absenteeism. These were the consequence of MSD resulting from static effort such as lifting, pushing or pulling objects and awkward postures.

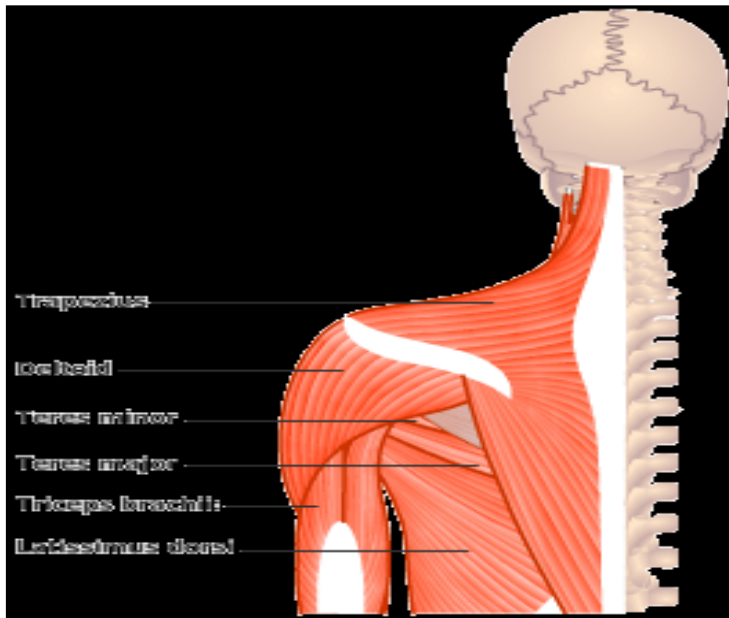
In workplaces where ergonomics or occupational health and safety programmes were designed, administered and implemented by persons not professionally trained, the programmes were inadequate and injury rates were high, compared to workplaces with professionally designed, administered and implemented ergonomics and occupational health and safety programmes. It requires management commitment to hire qualified ergonomics and occupational health and safety professionals to provide ergonomics training to employees and conducting appropriate risk analysis and corrective actions (Hal, 2008:420). This view is supported by the IEA (2010:17), which states that, in a well-designed workplace, workers can achieve more output with less effort and fewer risks to their health and safety. Health and safety professionals' focus is on maintaining and improving workers' health, safety and well-being. The application of ergonomics can provide other benefits, such as:

- Minimising wasted effort
- Reduced damage to equipment
- Less waste of product
- Improved productivity

Selis, Vanacker, Hermans, Mylle, Devriese, and Kerckhofs, (2012:5918-5919) conducted a study at an academic hospital to determine the impact of ergonomic interventions on the prevalence of MSDs and absenteeism. There was a significant decrease of more than 66% in the number of MSDs caused by lifting

and moving patients by the nursing staff; and the absenteeism figures decreased by almost 90%.

### 2.3 MUSCULOSKELETAL DISORDERS (MSDs)



**Figure 2-1 Musculoskeletal structure** (Dul, J. & Weerdmeester, B. 2001)

Musculoskeletal disorders (MSDs) are conditions that affect the body's muscles, joints, tendons, ligaments, and nerves. MSDs can develop over time or can occur immediately due to overload (European Agency for Safety and Health at Work, 2009:28). Manual heavy load handling, which entails enormous physical labour and associated discomfort, is recognised and acclaimed to invariably culminate in musculoskeletal disorders (MSDs). The cause of MSDs, in most cases, has been attributed to the adoption of awkward postures while heavy load handling, known as biomechanical stress (Gangopadhyay & Das, 2012:2467).

Musculoskeletal disorders result primarily from biomechanical stressors induced by job demands. Some psychosocial factors are also believed to trigger or worsen MSDs. These factors are referred to as workers' perceptions or beliefs about the organisation of their work environment. The European National Institute of Occupational Health and Safety (NIOSH) identifies the psychosocial factors related to MSDs as job dissatisfaction, intensified workload, monotonous work, job

control, and social support. MSDs present with aches, pain, sensory changes, fatigue and weakness. These symptoms are predictors of the rate of morbidity in the workplace, hence absenteeism (Barbieri, Nogueira, Bergamin & Oliveira, 2012:2462). According to these authors, the awareness of poor working conditions in the public sector, characterised by inadequate equipment, poorly designed space and poor management practices expose workers to different types of stress. Physical stress is caused by muscle strain, mostly of the neck, upper limb and lower back regions, associated with repetitive movements and sustained positions. The study suggested that improvement of organisational features combined with better workplace layouts, would reduce physical and psychological stressors, resulting in balanced work life, more efficiency and productivity.

A study by Ryland, Nelson and Hejkal (2010:124-133) showed that bent and twisted postures, if repeated over long periods of time, can result in MSDs. The study was conducted in theatres where doctors operated on infant surgical tables, which were found to be of inappropriate design and height for a comfortable working environment. When the tables were replaced with ergonomically modified ones, the working posture of doctors improved and repeated movements reduced. These resulted in reduced symptoms of MSDs. In order to reduce the risk factors contributing to the development of MSDs, it is necessary to first determine which risk factors are present.

One of the methods used to determine the presence or the risk of injury is the Nordic Musculoskeletal Questionnaire (NMQ). The questionnaire asks subjects to indicate any pain, ache or discomfort experienced within the last twelve (12) months or seven (7) days in the neck, shoulders, upper back, low back, elbows, wrists/hands, hips, knees, ankles and feet. The advantages of NMQ are:

- High repeatability and sensitivity to diagnose MSDs
- High reliability
- High efficiency in identifying the prevalence and incidence of MSDs.

The limitations of the questionnaire are low specificity to particular diagnosis since the format refers to general pain, and bias of subjects.

The other popularly used method is Cornell Musculoskeletal Discomfort Questionnaire (CMDQ), which determines the frequency of experience of MSDs, whether diagnosed or not; the level of discomfort and the level of interference with ability to perform duties. The questionnaire has high reliability, validity and repeatability in various settings (Cornell University, 1999; Erdinç, Hot and Özkaya, 2008:6-8).

### **2.3.1 Prevalence of MSDs in different occupational groups**

In a study by Selis et al. (2012:5919), 56.7% of participants reported MSDs. Complaints of pain in the low back, neck and shoulders were most common. There was a higher prevalence of MSDs with administrative personnel, nurses, care personnel and support services; and lower prevalence of MSDs with paramedics, technical personnel and doctors.

Healthcare workers (HCWs) in Canada were found to have a greater risk of workplace injuries and mental health problems than many other occupational groups, while nursing personnel also take considerably more sick days off than employees in most other occupations. It is important to note that HCWs face substantial occupational risks from exposure to poor ergonomics associated with patient care; patient violence; and exposure to allergens and infectious agents. For example, it has been well established that musculoskeletal disorders (MSDs) occur due to inadequate equipment and working environment, high work demands, staffing inadequacies, reduced work morale and poor social support. Nursing personnel report as high MSD prevalence as 60% for upper-body and 72% for lower-body. Psychological distress has been linked to high work load, patient aggression and stress (Pompeii, Lipscomb & Dement, 2010:285-287).

Many researchers and organisations from around the world have highlighted nursing personnel as a risk group in relation to musculoskeletal disorders. Thus the nursing personnel are the focus of research on the prevalence of MSDs in the



healthcare sector. Nursing comprises complex situations at work, such as prolonged standing, lifting and shifting, where there is interaction of various tasks, which lead to a high workload across body components. These put strain on the skeletal muscles resulting in high physiological cost to the individual regarding the task, cognitive cost (related to content and organisation of tasks, as well as the rate of mental exertion) and psychological cost (related to the level of conflict within the conscious or unconscious representation of the relationship between the person and the work situation (Lemo, Silva, Tucherman, Talerman, Guastelli & Borba, 2012:1869-1872).

Nurses face many risks at work while ensuring patient comfort, safety and security. Nurses have a responsibility to protect their own health and safety. This requires making judgements that balance risks with attaining patient care goals. Maintaining workplace safety is a form of 'organisational expertise' which is sustained in organisations by meaningful interaction between members in a cognitive, social and technical environment. Interacting with the environment influences perception about hazards, their origins and the possible ways to minimise them. Workplace safety is a collective process of interpretation and practice involving people and technologies within a connected system. Thus, as nurses interact through their work, they incorporate meanings of workplace safety into their conception of identity and practice in nursing. Therefore, comprehending nurses' interactions with people and safety information is helpful in understanding their perceptions and practices towards their own safety when performing manual tasks (O'Keeffe, Blewett & Thompson, 2011:1-2). The occupation of nursing has been studied extensively in the last decade, but with the increase of injuries to healthcare workers, especially nurses and assistants, the ergonomic risk factors have been the focus of research in the recent years. In 2006, registered nurses had the fifth highest number of musculoskeletal disorders in the US, more than construction workers and truck drivers. The average weight that a nurse lifts in an eight hour day is 1.8 tons; in addition, the average age of a nurse is 47 years. Consequently, with an increasing patient population coupled with an older

workforce, there is an increased risk of injuries, if patients are transferred manually (Baptiste, 2011:118-121; Waters, 2007:53-55).

Epidemiological research has provided evidence that tasks performed by caregivers involving patient handling are high risk tasks. The recommended safe weight limit for manual handling is 16kg. High risk tasks in patient care include repositioning a patient in bed and in a chair, bathing a patient in bed, lifting a limb, sit to stand transfers, lateral transfers, picking a patient up from the floor, and patient transport. One task commonly performed by nursing personnel is pulling a draw sheet from under a patient lying in bed for linen change. This task can be interpreted as a task where not only force, but impulse is higher, hence fatigue becomes a concern. The combination of high forces and high impulse while performing a task translates into a very high risk of injury either due to sudden acute trauma or possibility of cumulative trauma (Baptiste, 2011:116-121).

### **2.3.2 Cleaning personnel**

Cleaning is physically demanding and labour intensive work. Many studies on cleaning acknowledge the significant physical risks associated with cleaning tasks. During one single working day, most cleaners have to perform different types of tasks. This can imply that there is a high variety of tasks and postures, which are only maintained during shorter periods. But still, these postures are frequently and repetitively adopted. Cleaning tasks have been identified as strenuous and demanding for the musculoskeletal and cardio-respiratory systems cleaning (Søgaard, Blangsted, Herod & Finsen, 2006:580-583). According to Woods, Buckle and Haisman (1999), the main ergonomic risk factor in cleaning is the postural workload. Cleaners often work bent forward and with twisted backs, perform high numbers of repetitive movements of the arms and a high static and dynamic force output is regular, for example when mopping.

These types of muscular activities contribute to muscle fatigue and may lead to musculoskeletal disorders. The weight of loads handled by cleaners is an important risk factor to consider. According to a study by Aickin (1997), the weight handled by cleaners ranged from 2kg to 42kg. In another study by Weigall,

Simpson, Bell and Kemp (2005), the loads lifted and carried by workers were found to be between 5kg and 8kg. The heaviest activities involving lifting and handling were moving furniture and handling floor polishers. However, what made the lifting especially problematic was the combination of these activities with awkward postures adopted to handle the load. Weights were often lifted in twisted, bent and other awkward postures. Other factors such as the duration, repetition of handling the load as well as the individual characteristics of the worker also played a role.

The main ergonomic risk factors leading to MSDs and associated with cleaning tasks are:

- Awkward working postures: for the back and arms, for example when reaching and stooping, or when the work is performed in confined places;
- Application of high forces (e.g. scrubbing, squeezing, moving and controlling (power) equipment);
- Repetitive movements – sometimes performed during up to one hour – and insufficient resting periods;
- Lifting and carrying loads (especially in industrial cleaning);
- Static workload, for example when working with arms above shoulder level over longer periods of time to clean or dust, or forced by the use of equipment, for example when high-pressure spraying;
- Poor ergonomics design (shape, size, adjustment and angle) of equipment and equipment handles.
- Cleaners are exposed to a combination of risk factors of different nature. In addition to the above-mentioned ergonomic risks, cleaning work is often also characterised by a high work intensity – high workload, working under time pressure, difficulties in keeping up with work; poor work organisation

and high psychological demands, which are all factors associated with the development of musculoskeletal disorders.

**Table 2-1: The effects of cleaning activities on the body**

<b>Cleaning Activity</b>	<b>Effect on the body</b>
<b>Mopping</b>	<p>Movement controlled by wrist, requires high forces. This combination of repetitive movement and high forces can lead to MSDs in hand/wrist area. High static load on the upper arm and back muscles.</p> <p>Movements in the lower arms, elbows and wrists leads to:</p> <ul style="list-style-type: none"> <li>• structural changes in carpal tunnel region [64]</li> <li>• "Figure" eight mopping (i.e. moving the mop in</li> <li>• a figure eight pattern across the floor) leads to a higher oxygen</li> <li>• consumption level compared to back and forth mopping</li> </ul>
<b>Single disc cleaning machines</b>	Discomfort in hands (39%of cleaners), shoulders (19%), wrists (7%), lower back (7%) and arms (6%).
<b>Broom: Length of the handle</b>	Long-handled brooms are less likely to cause MSDs than short handled ones
<b>Buffing machine</b>	The force needed to operate a buffing machine may be very high when the machine has defects and not maintained.
<b>Vacuum cleaners</b>	Potential inappropriate gripping, unintentional operation of the mechanical suction feature, poor workers' training on how to operate machine, etc. can lead to unexpected movements/jerks from the vacuum cleaner which may hit the worker, and even cause accidents.

European Agency for Safety and Health at Work, 2009:33-38

In line with the effects of cleaning activities in Table 2-1, Studies by Woods, Buckle and Haisman (1999) and Weigall, et. al. (2005) found that the main issues of concern for cleaners were the lifting or carrying of cleaning machines (mostly vacuum or buffing machines), handles of unsuitable shapes and size, and the difficulties to adjust equipment to their needs. This can lead to awkward working postures with non-ergonomic joint angles. The forces required vary with the type of equipment handled, for example from a dust control mop which needs minimal force to move over the floor surface, to other equipment requiring much more force, for example, a wet mop on a very dirty surface. The largest forces were found when pulling and pushing trolleys to carry cleaning equipment, bed linen and towels. These studies also emphasise the fact that the cleaning equipment is often not adapted to the physical characteristics and capacities of workers, and that the conditions in which it has to be handled, for example, poor performance of the equipment, working in confined workplaces, lack of essential work accessories such as gloves, make the work even more difficult.

It is important to take into account that the design of cleaning equipment and tools is not the only aspect to consider for the safe use, but also:

- whether it is adapted to the characteristics of the intended user group (such as anthropometry and physical capacities) and their individual needs;
- the tasks for which the tool is used;
- the ergonomic arrangement of the working environment such as the quality of the floor surface, and the layout of the workplaces;
- the work organisation of a specific tool in a specific working environment, in terms of duration, frequency, etc.;
- interaction with other equipment;
- training and handling instructions.

The inadequate machine maintenance was also indicated as an additional risk factor. In the case of badly maintained machines (such as buffing machines), the majority of workers reported significant “jerking” when starting the machine, and they have to compensate for this and control the machine using their physical force. Increased vibration was also noticed. Handling cleaning equipment requires the use of forces in most of cases, which leads to discomfort and pain in the neck, shoulder, elbow, back and knees (Kumar, 2006).

To clearly understand the relationship between ergonomics and musculoskeletal disorders (MSDs), it is important to discuss posture and movement.

## **2.4 POSTURE AND MOVEMENT**

The knowledge of posture and movement derives from the specialist fields of biomechanics, physiology and anthropometrics.

### *Biomechanics*

When maintaining a posture or making a movement, the joints ought to be kept in a neutral position as far as possible, where muscles and ligaments supporting the joints are stretched to the least possible extent, thus subjected to less stress. In this position, the muscles are able to exert the greatest possible force. The work should therefore be done close to the body to avoid unnecessary stretching of the muscles. Prolonged postural positions, twisting the body and sudden and repetitive movements must be avoided as these affect proper balance of the joints involved, and causing strain on the musculoskeletal system (Dul & Weerdmeester, 2001:5-9).

### *Physiology*

Physiology deals with the energy demands on the heart and lungs resulting from muscular effort during movements. In addition to the strain of muscles employed in posture or activities as described above, general body fatigue can occur due to carrying out physical tasks over a long period of time. The limiting factor in this regard is the amount of energy which the heart and lungs can supply to the

muscles to allow postures to be maintained and movements to be carried out. It is necessary to rest between tasks or to take short breaks when performing a task of long duration (Dul & Weerdmeester, 2001:10).

### *Anthropometry*

Anthropometry is concerned with the size and proportions of the human body. The designers of workplaces, equipment and accessories must bear in mind the differences in body size of the potential users. Adjustable work spaces and equipment are thus the solution to prevent musculoskeletal illnesses (Dul & Weerdmeester, 2001:11).

All employees in an organisation – managers and juniors – have to be knowledgeable about the posture and movements associated with their type of work. The managers' decisions based on this knowledge or lack thereof have profound influence on the production within the work systems (McKeon & Twiss, 2004:7-8). Work system designs have three goals: safety, productivity, and worker satisfaction (Helander, 2006:14). Greater awareness of ergonomics issues will encourage the evaluation of the workstation design, work design, equipment design and work organisation from the user perspective (McKeon & Twiss, 2004: 7-8).

## **2.5 ABSENTEEISM**

### **2.5.1 Background**

Viviane (2011:1) states that the word 'absenteeism' was initially used in dealing with employees in Britain during the First World War. At that time, production was vital, and employee absence from the workplace was keenly felt.

According to Ndhlovu (2012:10), absenteeism is absence of the employee from the workplace where officials have to perform their work, and it is considered to be important for measuring employee morale and, for indirect measurement of employees' health and well-being.

Absence is commonly understood to be a workplace-related phenomenon, where managers view it in terms of an employee not being at work, hence the phrase, *absence from work*. It follows then that employees will have the same view. How a person views absence is influenced by orientation to work and the employment contract. Employees with an orientation that their primary relationship with an employer is money, are likely to take whatever action they deem necessary to achieve their just rewards. Once that is done, they can focus on the non-work interests. Others who see their employment as a service to an organisation, have a relationship with work involving moral obligations. Such employees feel guilty if they do not attend because their orientation holds that they should be there (Duijts, Kant, Swaen, van den Brandt & Zeegers, 2007:1108-1112).

This leads to the concept of psychological contract, which defines the set of unwritten reciprocal expectations between an individual employee and the organisation. Thus, managers and professionals in high discretion roles would view absence as work-related behaviour; while lower category employees might have a more restricted view of their obligation to go to work. Absence therefore has different meanings to different people (Griep, Rotenberga, Chorb, Toivanenc & Landsbergis, 2010:188).

The meaning of absence is often approached from the management perspective which holds that absence is deviant behaviour which costs the organisation efficiency and productivity. This view, however, is not universal. It does not mean that employees at lower levels in the organisational hierarchy are more inclined to be absent from work. Absence is frequently found in white-collar personnel in different forms. "It is right to sit around in the office and talk ... take longer lunch hour than everyone else ... to run personal errands during the day while the blue-collar workers must observe the company policies" (McGoldrick, 1996:96).

Clearly, it is one thing to show up for work every day; it is another to work when one gets there. It raises a question what absence is and what it is not.

Absenteeism is a major concern within the health care sector, considering that job demands and work environment expose workers to increased risk of illness and



injury. Efficient delivery of health services can be achieved if the resources are available. Human resources are vital in the health care sector since it is a labour intensive sector. The Department of Health renders direct services to patients who require medical treatment from clinical personnel and indirect services from the non-clinical personnel. Therefore, when employees do not present themselves for work when scheduled to do so, they impede effective service delivery (Grobler, Warnich, Carrel, Elbert & Hatfield, and 2011:257).

Davey, Cummings, Newburn-Cook and Lo (2009:312-313) and Springer (2007:130) add that nurses' absenteeism, as opposed to other occupational classes, is likely to be due to illness and injury due to the increasing pressure they have to work under and efficiently so, often with limited resources. Absenteeism, according to Leblebici (2012:38, 41), is a symptom rather than a root cause. The working environment is most probably the root cause of employee absenteeism in many organisations. The participants' response in the study by Leblebici (2012:38, 41) revealed that effective workplace design is important to increase employees' productivity and reduce absenteeism. Another study, conducted by Widanarko, Legg, Stevenson, Devereux, Eng, Mannetje, Cheng and Pearce (2012:727-728), assessed MSD symptoms and consequences with a recall period of 12 months, and obtained information on physical exposures such as awkward posture, repetitive movements, lifting and carrying heavy objects. A 9% prevalence of absenteeism was recorded for health service workers in various European countries and 14% prevalence in laundry and cleaning workers, due to MSD. Between one and three days sick leave days have been taken.

Sick leave and absenteeism have been reported to be at increased levels among public service employees in the United Kingdom. There are strong indications that processes of restructuring have led to an increasing number of professionals expressing a desire to resign from their jobs due to intensified work demands. (De Ruyter, Kirkpatrick, Hoque, Lonsdale & Malan, 2008:432). Similarly, in South Africa, the restructuring of public health care services to prepare for the roll out of the National Healthcare Insurance and the re-engineering of primary healthcare, in

the midst of severe shortage of personnel, has led to increased work overload (Department of Health, 2011/2015).

For the purpose of this document, health care workers (HCWs) include all hospital employees who have the ability to acquire or transmit infectious agents during the course of their work, for example, doctors, nurses, therapists, cleaning/maintenance personnel, patient care assistants, clerks, and technologists (Donovan, 2008).

### **2.5.2 The impact of absenteeism on service delivery**

When determining the cost of absenteeism, the following should be taken into consideration (Circadian, 2005:2):

- Scheduled absences which consist of planned vacation or personal time. Unplanned costs arise when time taken is not reported or when personnel take time off when they do not have leave credits.
- Unscheduled absences which include sick leave, disability leave, and labour uprisings. The costs are also due to unreported time off or the employee not being entitled to the type of leave granted.
- Partial shift absences include late arrival at work, leaving early and taking longer breaks than allowed. These have a direct impact on delayed productivity, customers not served or customers poorly served (lack of efficiency).

Absenteeism leads to sub-standard patient care. The research by Madibana (2010:22) found that the high rate of absence among nurses had an adverse effect on quality of care rendered to patients due to work overload and decreased morale of workers who are expected to cover for an absent employee.

Ndhlovu (2012:27) found that hospitals bear high cost in terms of working days lost. Employees on sick leave are still fully paid. If they are not at work, the expenditures embodied in them do not reach their beneficiaries. Hospitals in South

Africa lose millions of rands annually in decreased efficiency and benefit payments. This is supported by a Canadian study by Yassi, Gilbert and Cytovich (2005:334) which indicates that workplace injuries as a result of poor ergonomics comprised the majority of time loss claims.

### **2.5.3 Musculoskeletal disorders and absenteeism**

Absenteeism is acknowledged to be an indirect measure of health and well-being of a worker. Sickness absence, which is paid leave from work due to health reasons, is an essential benefit provided by employers to ensure employees are healthy and productive at work. However, employers incur large cost in lost days and productivity associated with this benefit. The rate of sickness absence is particularly high for the healthcare sector in the Canadian province of British Columbia (BC) (Griep et al., 2010:179). The incidence of chronic non-specific musculoskeletal disorders (MSDs) is a prominent public-health problem in most welfare states. The influence of MSDs on the degree of employee absenteeism and disability allowances is high (De Vries, 2011:6-11).

Literature has addressed the occupational issue of absenteeism due to sickness in terms of various contributing factors and outcomes, and found it to be a multifaceted issue which is influenced by demographics, health status, mental health, work/occupation, personal and organisational factors (Duijts, et al., 2007:1105-1115). Older, female healthcare workers who had full-time status and/or worked in long-term care, had higher probability of taking sickness absences. Female employees had a higher risk of sickness absence than males (Eriksen, Bruusgaard & Knardahl, 2003:271-278; Zorbil-Benson, 2002:89-107). According to Mastekaasa 2005:2261-2262 sickness absences are related to gender and the rate is higher in female-dominated work places, such as the healthcare sector. In terms of age groups, there were similarities in results with the studies by Lim, Geater, Chayaphum and Thammasuwan (2002:254-263) where older health workers were found to take more sick leave days than younger workers. The latter study showed that the age group of 45–64 years, specifically, to have the highest sickness absenteeism.

In terms of occupation, among certified nursing assistants in Norway who reported work-related back pain, Erikson et al. (2004:398) observed that several factors, including high work demands, lack of supportive work environment, and fatigue were predictors of experiencing at least one incident of taking least three days from work. Within this same study population, predictors of taking at least 14 days from work included experiencing intense pain and having a change in allocation of tasks, which resulted in reduced workplace support and encouragement. When assessing time lost from work, Pompeii, et al. (2010:286-294), found that the level of pain associated with back injuries among nurses is the determining factor for time taken from work. The vast majority of nursing personnel who presented with occupational back pain took seven days or less from work, and those who experienced more severe symptoms such as severe pain and numbness or tingling sensation, or had prior injuries are at greater risk of taking more than seven days leave of absence. Furthermore, the study by Griep et al., (2010:190) suggests that different combinations of stressors are related to different lengths of sickness absence. A combination of physical job strain and Effort-Reward-Imbalance led to short-term stay from work.

Employees have varying thresholds for taking sick leave; some may be ill and still go to work or may take voluntary absences. Psychosocial factors in and out of the work environment have been cited as the reasons for presence at work despite experiencing musculoskeletal disorders (Gorman, Yu & Alamgir 2010:119). The section below discusses the motivational factors to stay at work.

#### **2.5.4 Motivators for staying at work (SAW)**

(De Vries, Brouwer, Groothoff, Geertzen & Reneman 2011:6-11)

##### **1. Work as a value**

Participants found recognition and approval in their work, self-realization, and self-respect. Thus, work gave meaning to the lives of many people. Participants stated that work provided a goal or mission in their lives.

## 2. Job satisfaction

This was often stated as a strong motivator for SAW because work was rewarding. On the other hand, there were participants who indicated that work was no longer giving them any joy, yet they kept on working. In those cases, there were other motivators which compensated for this, for example, work as a means of ensuring income.

## 3. Self-realization

Some participants stated that they feared a stationary situation without their work.

## 4. Useful member of society

Many participants felt an urgent need to participate in society. They feared losing touch with work and society if they stayed off work.

## 5. Social status

Having a job was regarded as status, which made it evident that one can earn one's own living.

## 6. Social norm

Some participants try to act in accordance with what is the general belief. Fulfilling this ambition secured a feeling of self-respect.

## 7. Work as therapy

Some participants experienced their work as being a place for healing and recovering. They indicated that being at work increased their mental and physical well-being. It provided distraction from pain. Few participants indicated that the harder they worked, the less pain they experienced.

## 8. Work as an energizer

Other participants felt work to be a source of new energy.

#### 9. Social contacts

Being at work generated social contacts; this may prevent feelings of loneliness. Participants linked social contacts to distraction, indicating that contacts distracted them from the pain. Being around colleagues gave new energy.

#### 10. Self-respect

Some participants indicated that working brought about self-respect, a reason to be proud. Thus, increased self-confidence has also been mentioned as a therapeutic aspect of working.

#### 11. Work as income

For most participants a secure income appeared to be a strong motivator to stay at work with MSDs, while for others, the financial aspect was of less importance. Being the owner of a business was mentioned as a strong motivator, for the reason that work guaranteed income. Employees qualify for workers' compensation / disability benefits. Owing to the high cost of insurance, self-employed people are seldom covered against illness. Moreover, self-employed participants were convinced that their commitment was keeping them at work.

#### 12. Work as responsibility

Few participants felt they were indispensable at their work. They perceived their presence at work as a necessity, making them determined to work despite pain. Being absent without anyone substituting would mean that the work would not be done. The consequences of this could be very concerning, for example, students would be deprived of education, patients wouldn't get the care they needed, etc.

### 13. Loyalty to colleagues

Some participants felt that, if they stayed from work, their colleagues would have no other choice but to work harder to make up for them. Loyalty to colleagues appeared to be a significant motivator for SAW.

People working in health care services have been shown to have increased tendency of being at work when ill. Different cultural and organisational factors have been found to be the reasons for their decision not to take sick leave. Health care workers regard a substantial core of daily tasks as the “must-do tasks”. Barriers to sick leave among health care workers included difficulty in replacement during absence, the extent of the work that needs to be covered by the workers’ own efforts after the absence and attitudes towards their own health (Rantanen & Tuominen, 2011:228).

## **2.6 CONCLUSION**

Absenteeism or sickness absence is a worldwide concern due to the economic consequences for the employer, for government or profitable institutions, and for the workers themselves. A broad spectrum of factors influence sickness absence, including demographics, health systems, health status, and preventative occupational actions. By promoting detection mechanisms promptly, workers at risk can be readily identified and treated for musculoskeletal and connective tissue disorders. A preventative research-focused agenda is desirable for a more accurate depiction of this population in the scope of policy-making (Zechinatti et al., 2012:3-4).

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

#### **3.1 INTRODUCTION**

Chapter 2 provided an overview of national and international research in development of musculoskeletal disorders as a result of poor ergonomics, consequently contributing to high rate of absenteeism in the workplace. This chapter outlines the research design and methodology which were employed to address the research objectives in the determination of the impact of poor ergonomics on absenteeism, as a result of musculoskeletal disorders in Botshabelo District Hospital.

#### **3.2 RESEARCH DESIGN**

The purpose of a research design is to answer a specific research question or questions using well-developed principles of scientific inquiry. Thus, a researchable question must be formulated, either in the form of a hypothesis that certain relationships exist among variables, or it may be exploratory to determine the relationship among variables (Bryman & Bell, 2007:55).

The research design will therefore be experimental or non-experimental depending on the choice of variables, procedures, controls and randomisation plans. The non-experimental control of variables is exercised by choosing cases to meet certain specified criteria. In this study, an organisation in the public health sector was selected, and the variables of interest on ergonomics, musculo-skeletal disorders (MSDs) and absenteeism were observed (De Vos et al., 2011:156). This study is thus quantitative research.

##### **3.2.1 Classification of research designs**

Bryman and Bell (2007:55) define quantitative cross-sectional research as the collection of data on more than one case and at a single point in time in order to collect a body of quantitative or quantifiable data in connection with two or more



variables. These variables are then analysed in an attempt to detect patterns of association.

### Quantitative Cross-sectional design

A quantitative cross-sectional design was used in this study, whereby all measurements are taken at one point in time. This design is popular due to its simplicity and ease of administration; it requires two or more measures on a set of subjects at one point in time, and does not require manipulation of subjects. In using this design, the investigator may develop a measurement instrument, use the existing one or collect data from existing records (De Vos et al., 2011:168).

This design is useful to determine if two or more variables are related. For two variables, one can calculate the correlation coefficient as an index of the strength of relationship and test it for statistical significance. For three or more variables, more complex data analysis methods are used. When there are several variables, the interest may be in determining whether one can construct a smaller number of factors which does an adequate job of explaining the original larger set. A procedure such as factor analysis is a technique developed to determine the underlying theoretical factors among a set of variables (Sekaran & Bougie, 2011:71). If an assumption is made that certain variables are caused or preceded by others, one can use multiple regression to derive a functional relationship between the two sets. With this procedure, one predicts a criterion or dependent variable from a set of independent variables. The equation used is:

$$Y = b_0 + b_1X_1 + \dots + b_nX_n$$

Where Y = dependent variable

X = independent variable

b = constant

X and Y are observed, bs are calculated from the data correlation and regression coefficients; and are used to compare the observed results to those predicted by the theory or models (Sekaran & Bougie, 2011:69-75).

The ergonomic analysis of the units (Y), the prevalence of musculoskeletal disorders ( $X_1$ ) and absenteeism ( $X_2$ ) will be assessed.

### **3.2.2 Shortcomings of cross-sectional design**

- It only establishes relationships but no causal effects.
- There may be bias due to Hawthorne Effects (that is, providing good data for the investigator).
- With the use of self-report questionnaires or interviews, subject response tendencies and bias may account for false relationships. The subjects' reports may be in a manner that enhances the correlation coefficients. Using several modes of data collection, or collecting data in a way that assure non-interaction of measures, circumvent this problem.  
(Bryman & Bell, 2007:65)

### **3.3 SAMPLING STRATEGY**

Probability and non-probability sampling are two main types of sampling design. In this study, probability sampling was used, where the participants had some known non-zero chance of being selected as a sample. Stratified random sampling is a method of probability sampling whereby the sample is segregated/stratified into groups from which participants will be randomly selected (Sekaran & Bougie, 2013:245-249).

Stratified random sampling was used where all units (strata), for example, nursing, administration, portering, and supply chain were represented. This type of sampling is useful to reduce sampling errors and ensure good representation of the population (Dahlberg & Colin, 2010:175-176), with the numbers in each stratum being one-twentieth of the total for each department. This ensures that the sample will be distributed the same way as the population in terms of the stratifying criterion (Bryman & Bell, 2007:187). The population of the study

comprised 373 workers at the Botshabelo District Hospital in the Mangaung Metropolitan District.

**Table 3-1 Population stratification**

		Number of employees in the sample	
Job Level	Population	20% of the population (Proportionate)	Disproportionate sampling
Management/Supervisors	18	4	12
Employees:			
Nursing personnel	120	24	19
Clinical personnel	44	9	14
Administrative personnel	191	38	30
Total	373	75	75

(Adopted from Sekaran and Bougie, 2013:250)

### **3.4 DATA COLLECTION**

Self-completion questionnaires were used to obtain data since they are cheaper and quicker to administer. Secondary data analysis was used in the form of statistical data from the Occupational Health and Safety and Human Resources Units, on the reported musculoskeletal conditions which led to sick leave (Bryman & Bell, 2007:326).

To improve the response rate and reduce the response bias, the following was employed:

- The intention to conduct the research was announced in various forums and meetings.
- A letter explaining the reasons and the importance of the research was distributed.

The questionnaires were hand distributed and collected (Bryman & Bell, 2007:244).

### **3.4.1 Cornell Musculoskeletal Discomfort Questionnaire (CMDQ)**

An adapted Cornell Musculoskeletal Discomfort Questionnaire (CMDQ) was used to determine the prevalence of musculoskeletal disorders and the rate at which they interfered with ability to work and caused absenteeism.

Assessment of musculoskeletal discomfort is imperative in establishing the extent to which musculoskeletal disorders (MSDs) threaten health and productivity in workers. Cornell University in Turkey formulated a tool for this purpose (Cornell University, 1999).

#### **3.4.1.1 Nature and composition of CMDQ**

The questionnaire measures the frequency of pain in various parts of the body as a result of MSDs, the severity of pain and the extent to which it interferes with the ability to work.

#### **3.4.1.2 Reliability**

Erdoğan, Hot and Özkaya (2008:6-8) conducted a study to test the reliability and validity of CMDQ. The measurements comprised the test-retest reliability and internal consistency of CMDQ.. Participants completed CMDQ twice in order to measure test-retest reliability. The range of the time interval between two tests was between 7–10 days as recommended in literature. Kappa coefficient for frequency, severity and interference scales separately were used to assess the test-retest reliability of CMDQ. The coefficient ranged between 0.564–0.948, 0.589–0.972 and 0.598–0.944 for the scales respectively. Among the Kappa coefficients examined across three scales, proportions of moderate, substantial and almost perfect agreement level coefficients were 6.7%, 71.6% and 21.7% respectively. The test-retest responses in three scales of low back and severity scale of back were in moderate agreement, while the responses in remaining body parts across three scales were in substantial or almost perfect agreement.

The internal consistency of each scale (frequency, severity and interference scales) was assessed by Cronbach's alpha statistic. These were 0.876, 0.895 and 0.875 respectively, which indicated a high internal consistency of the CMDQ.

#### **3.4.1.3 Validity**

The validity of CMDQ was measured using the Visual Analog Scale (VAS) of 100mm. (i.e. No ache, pain, discomfort at all; '0', Very severe ache, pain, discomfort; '100') which was completed by participants. VAS is widely used in validation of health related questionnaires. VAS responses were compared with responses given in CMDQ frequency and severity scales. It was hypothesised that participants who report discomfort in VAS should also report discomfort in CMDQ frequency scale at any level. Similarly, those who did not report any discomfort in VAS were also expected to respond "Never" in CMDQ frequency scale. VAS scores were also expected to correlate positively with CMDQ severity scores. Thus, agreement between responses given in VAS and CMDQ frequency scale was measured by Kappa coefficient and correlation between VAS scores and CMDQ severity scale scores was assessed using Spearman correlation coefficient (Erdoğan, Hot & Özkaya, 2008:6-8).

Kappa coefficients ranged between 0.617–0.917 across body parts indicating substantial to almost perfect agreement between VAS responses and CMDQ frequency scale responses. The range of Spearman correlation coefficients was between 0.463–0.834 across body parts ( $p < 0.005$ ), which indicated that VAS scores and CMDQ severity scale scores were positively correlated.

#### **3.4.1.4 Rationale for inclusion:**

These results indicated that the test-retest reliability of frequency, severity and interference scales were satisfactory. The high values of Cronbach's alpha statistic suggest that internal consistency across three scales was also high. The Spearman correlation coefficients suggest validity of the questionnaire. Based on the results above, and the ease of application of the tool, it was concluded that CMDQ is a valid and reliable data collection tool.

Posture and ergonomics at different work stations were observed by the researcher.

### **3.4.2 Secondary data collection**

Secondary data was collected from the hospital's Occupational Health and Human Resources Units, which keep data with regard to sick leave.

## **3.5 ETHICAL CONSIDERATIONS**

The following ethical guidelines, as proposed by Sekaran and Bougie (2011:221), were applied during data collection:

- Informed consent was obtained from all participants before the completion of the questionnaires.
- Confidentiality and anonymity of participants were ensured during the study. These were used as a strategy for participants to provide honest response.
- The researcher ensured that the respondents did not suffer harm in any form, for example, stress, victimisation or self-esteem as the result of the research.
- Participants were provided with information on the research process, why they were selected, and the significance of the research for them and the employer.
- The participants were informed that their participation in the study is voluntary, and were given the option to withdraw from the study at any time. They were requested to be honest in their responses.
- The findings of the data collected was not distorted in any way.
- Findings of the study were communicated to the Botshabelo District Hospital Management. A written report was submitted and an oral presentation was provided to the management.

Permission was obtained from the hospital management to conduct the research in the institution. The Chief Executive Officer of the hospital registered the research with the Head of the Department of Health. At the completion of the research a report on the findings was submitted to the Chief Executive officer of the hospital. (DoH: Policy on Conducting a Research in the Free State Department of Health, 2011:3).

### **3.6 DATA ANALYSIS**

Data analysis enables one to determine a relationship between the variables, in this study, musculoskeletal disorders (MSDs) and absenteeism (Sekaran & Bougie, 2013; 288). According to Hedge (2009:1336-1339), scores can be analysed in 4 ways:

1. By simply counting the number of symptoms per person.
2. By summing the rating values for each person.
3. By weighting the rating scores to more easily identify the most serious problems as follows:
  - 1-2 times/month = 1.5
  - 3-4 times/month = 3.5
  - Once a week = 5
  - Several times every week = 10.
4. By multiplying the above Frequency score (1.5, 3.5, 5, 10) by the Discomfort score (1, 2, 3, 4) by the Interference score (1, 2, 3, 4).

In the computational analyses missing values can be coded as 0. If the missing value is for the frequency score, then use this as a zero in multiplying, i.e. all combinations of Frequency, Discomfort and Interference become 0. However, if the missing value is in the Discomfort or Frequency score, then treat it as missing so that the multiplied score will be at least the value of the Frequency score. The importance of multiplying frequency score by discomfort score and by the interference score is to spread the scores so that one can more easily find the most severe cases.

For example, if there is someone who has right shoulder pain once every week (score of 5), and this is very uncomfortable (score of 3) and it substantially interferes with their work (score of 4), and this score is added, it would only be  $5+3+4 = 12$ , but if their score is multiplied for the right shoulder it is  $5 \times 3 \times 4 = 60$ . If this is compared to someone who had right shoulder pain 3–4 times in the last month (score of 3.5), which was moderately uncomfortable (score of 2) and slightly interfered with their work (score of 2), the added score would be  $3.5+2+2 = 7.5$ , which does not seem that much different from 12 for the previous person, but if the scores are multiplied the result is  $3.5 \times 2 \times 2 = 14$ ; which is almost 1/3 of that for the previous. So by multiplying out the scores it stretches the scales and makes it easier to see those people with the greatest problems.

The data findings were confirmed statistically using the chi-square ( $\chi^2$ ) test, which indicates whether or not the observed pattern is due to chance. This test is associated with the degrees of freedom (df) denoting whether there is a significant relationship between variables or not. The chi-square test was used to test whether or not there was a relationship between musculoskeletal disorder in different body parts pain and interference with the ability to work. The p-value of different body parts was compared, with a significance level of 0.1. The p-value of less than 0.1 indicates that a relationship exists between the variables.

A positive relationship between the variables will have the positive correlation coefficient, and it will range between 0 and 1. The closer the value is to 1 the stronger the relationship between the two values. On the other hand, if there is a negative relationship the correlation coefficient will be negative and it will range between -1 and 0. The closer the value is to -1 the stronger the relationship between the 2 values. Two variables, pain and interference were constructed by summing up all the prevalence responses per respondent as well as the interference responses per respondent.

The analysis also entailed determining the relationship between the prevalence of pain and interference with work, and between the level of discomfort and interference with work. (Sekaran & Bougie, 2013:288).



### **3.7 CONCLUSION**

The chapter outlined the quantitative cross-sectional research design and methodology used in this study. An attempt was made to gain a better understanding with regards to the prevalence of musculoskeletal disorders as a result of poor ergonomics, and the effect on absenteeism in the Botshabelo District Hospital.

Data collection and analysis were discussed, which included secondary data on absenteeism as a result of musculoskeletal disorders. The findings of the research are discussed in the next chapter.

## **CHAPTER 4**

### **RESULTS AND DATA ANALYSIS**

#### **4.1 Introduction**

The previous chapter discussed the quantitative, cross-sectional research design and methodology, the basis from which the results will be presented in this chapter. The presentation of findings will commence with demographic data followed by the prevalence of musculoskeletal disorders, the level of discomfort and the degree of interference with ability to perform duties (interference with work).

Seventy three (73) questionnaires were distributed to management, clinical and support sections of the hospital. Sixty six (66) were collected for analysis, giving a response rate of 90.4 %.

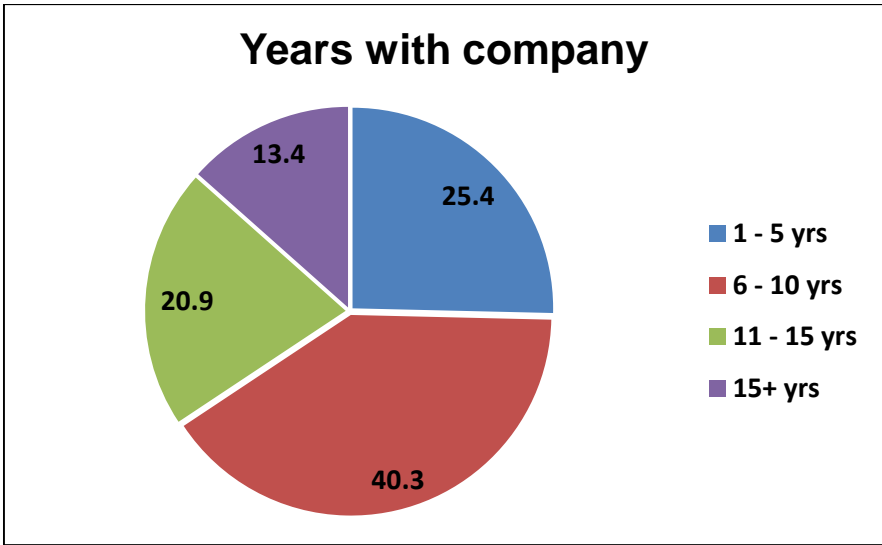
#### **4.2 Descriptive statistics**

##### **4.2.1 Demographic Data**

In the next section the biographical data will be discussed.

##### **4.2.1.1 Years with the company**

Figure 4.1 displays a graphical representation of the years of service regarding the sample.

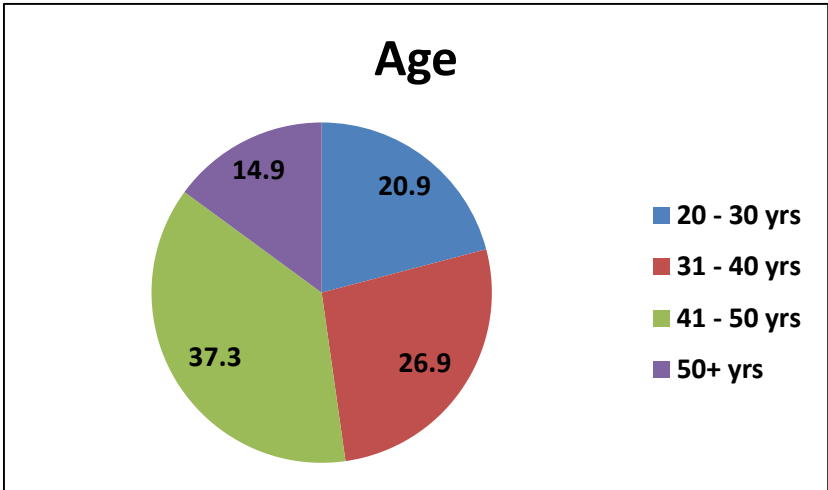


**Figure 4-1 Years of service**

Most of the respondents, 40.3% have worked in the institution for six to ten (6-10) years, followed by those who have worked one to five (1-5) years (25.4%), eleven to fifteen (11-15) years (20.9%) and fifteen years (15) and more (13.4%).

**4.2.1.2 Age**

Figure 4.2 displays a graphical representation of the age groups regarding the sample.

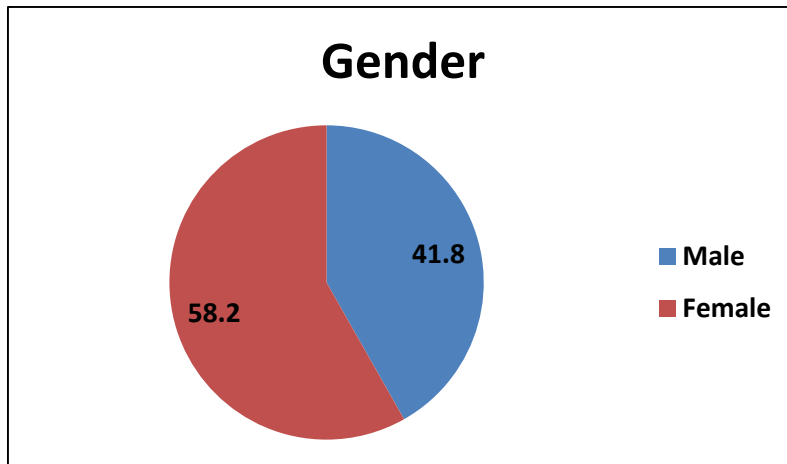


**Figure 4-2 Age groups**

The highest number of respondents fall within the 41-50 years of age and 31-40 years. There were approximately 20.9% in the 20-30 years group and 14.9% in the 50+ years group.

#### 4.2.1.3 Gender

Figure 4.3 displays a graphical representation of the gender regarding the sample.

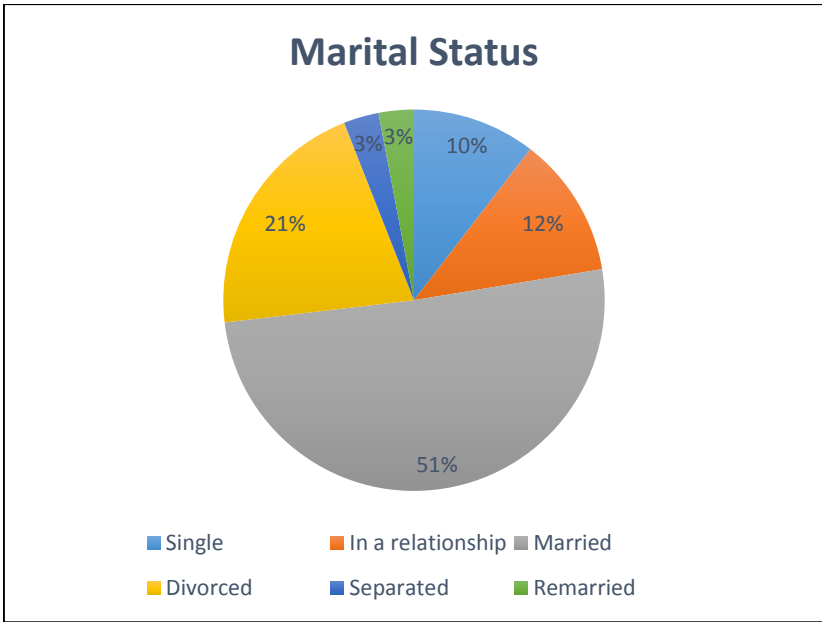


**Figure 4-3 Gender**

The respondents were mostly female employees, 58.2%, than males 41.8%.

#### 4.2.1.4 Marital Status

Figure 4.4 displays a graphical representation of the marital status regarding the sample.

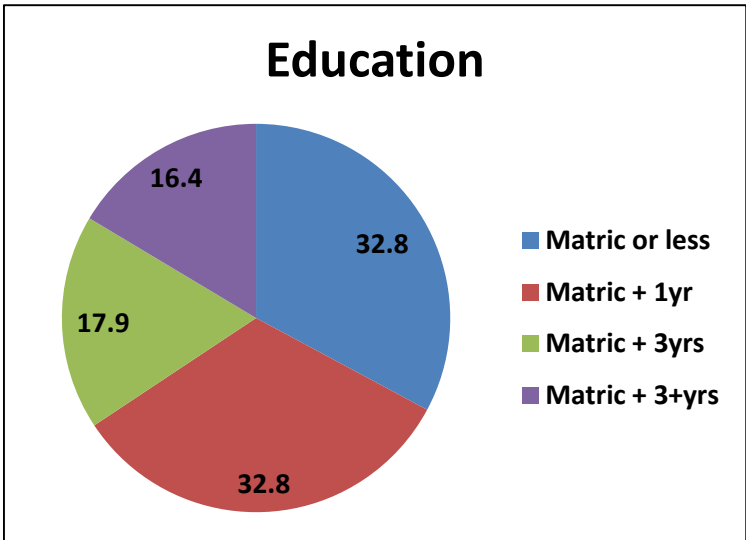


**Figure 4-4 Marital status**

The results indicate that most respondents are married, 51%, 21% are divorced, 12% are in a relationship, 10% are single, while 3% is either separated or remarried.

**4.2.1.5 Education**

Figure 4.5 displays a graphical representation of the educational level regarding the sample.

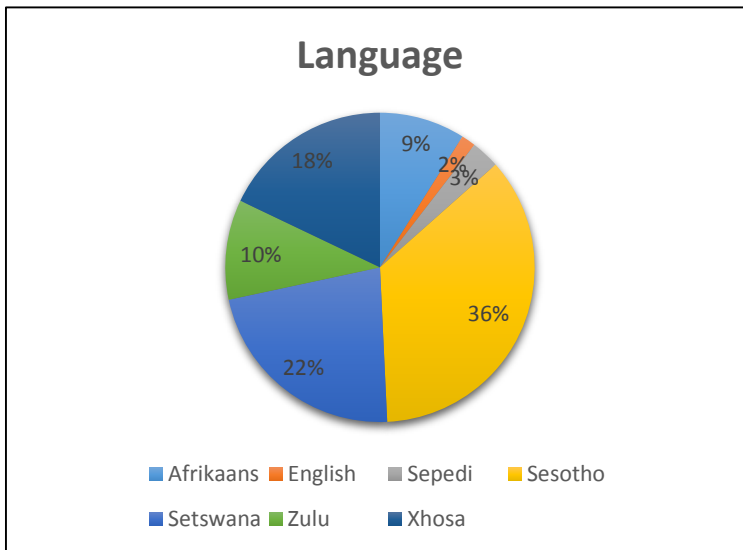


**Figure 4-5 Education**

Out of 66 respondents in the study, 32.8% have matric as the highest level of qualification or have matric and one year post matric qualification. Those with three years post matric qualifications comprise 17.9%, and those with more than three years post matric qualification comprise 16.4% of the employees.

#### 4.2.1.6 Language

Figure 4.6 displays a graphical representation of the language regarding the sample.

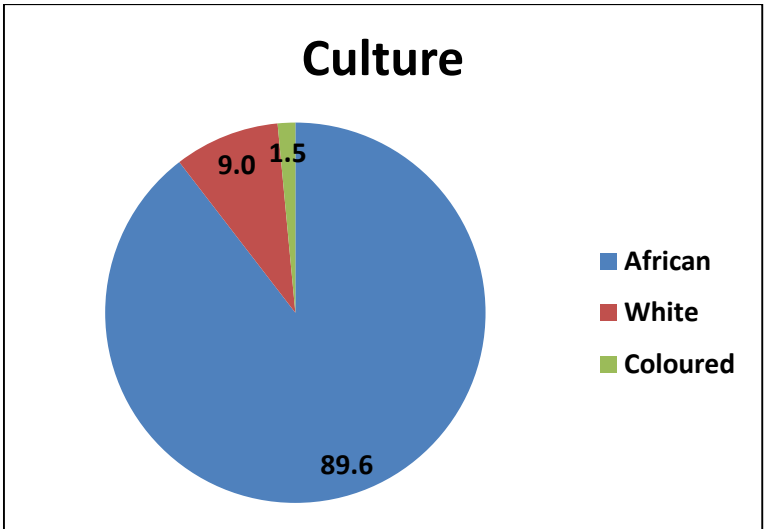


**Figure 4-6 Language**

Most of the respondents were Sesotho speaking (36%), 22% is Tswana, 18% is Xhosa, 10% is Zulu, 9% Afrikaans, 3% speak Sepedi and 2% speak English.

#### 4.2.1.7 Culture

Figure 4.7 displays a graphical representation of the culture regarding the sample.

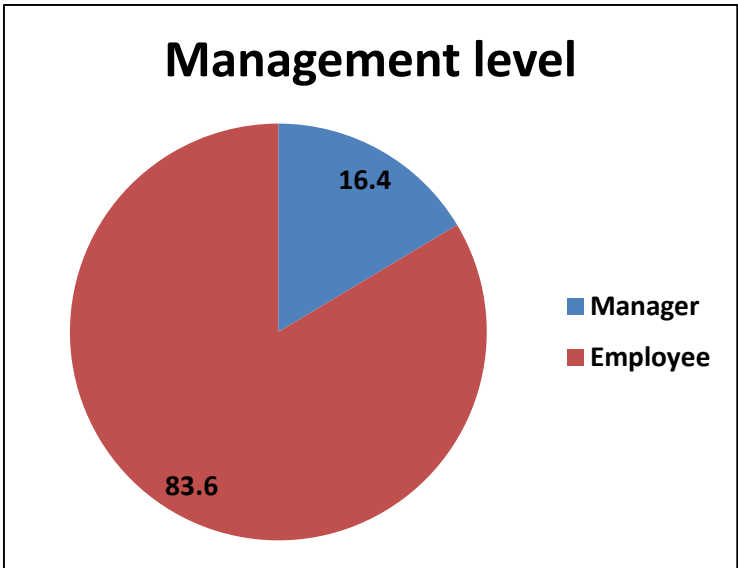


**Figure 4-7 Culture**

The respondents comprised 89.6% Africans, 9% were White and 1.5% were Coloured.

**4.2.1.8 Employment Level**

Figure 4.8 displays a graphical representation of the employment level regarding the sample.



**Figure 4-8 Management level**

83.6% of the respondents were operational staff and 16.4% were at management level.

### 4.3 Musculoskeletal Disorders

#### 4.3.1 Prevalence of pain

Table 4-1 below provides data on the prevalence of musculoskeletal disorders of various parts of the body in the sample.

**Table 4-1 Prevalence of pain**

Prevalence	Neck	Shoulder_R	Shoulder_L	Upper Back	Upper arm R	Upper arm L	LowerBack	Forearm R	Forearm L	Wrist & Fingers R
1-2 times/month	11.9	11.9	11.9	10.4	0	0	10.4	0	0	4.5
3-4 times/month	20.9	20.9	17.9	11.9	4.5	0	11.9	0	0	1.5
Once/week	10.4	4.5	1.5	4.5	3.0	0	11.9	1.5	0	0
Several times/week	6.0	11.9	6.0	3.0	1.5	0	19.4	0	0	0.0
None	50.7	50.7	62.7	70.1	91.0	100.0	46.3	98.5	100.0	94.0

Prevalence	Wrist & Fingers L	Hip /Buttocks	Thigh R	Thigh L	Knee R	Knee L	Lower leg R	Lower leg L	Foot R	Foot L
1-2 times/month	1.5	3.0	0	0	3.0	9.0	1.5		9.0	4.5
3-4 times/month	0	4.5	0	0	3.0	3.0		1.5	1.5	3.0
Once/week	0.0	4.5	0	0	4.5	4.5	3.0	1.5		
Several times/week	0	1.5	0	0	1.5	1.5			4.5	4.5
None	98.5	86.6	100.0	100.0	88.1	82.1	95.5	97.0	85.1	88.1

There is high prevalence of neck and shoulder pain followed by low back pain. 20.9% of the respondents experienced neck pain at least 3-4 times a month, 10.4% once a week and 6.0% several times per week; while 50.7% of respondents did not experience neck pain. For respondents with low back pain, most of them (19.4%) experienced pain several times per week and 46.3% experienced none. On average, 93.3% of participants did not experience pain on the peripheral joints (arms and legs). The peripheral joints which were more susceptible to pain were



the joints of the feet, knees and hips. The level of discomfort will be discussed next.

### 4.3.2 The level of discomfort

Table 4-2 below provides data on the level of pain discomfort caused by musculoskeletal disorders of various parts of the body in the sample.

**Table 4-2 Level of discomfort**

Discomfort	Neck	Shoulder R	Shoulder L	Upper Back	Upper arm R	Upper arm L	Lower Back	Forearm R	Forearm L	Wrist & Fingers R
Slightly	1.5	1.5	0	4.5	1.5	0	7.5	1.5	0	6.0
Moderate	19.4	17.9	16.4	14.9	3.0	0	19.4	0	0	0
Very	25.4	26.9	20.9	7.5	3.0	0	17.9	0.0	0	0.0
Unbearable	1.5	3.0	0	3.0	1.5	0	9.0	0	0	0
None	52.2	50.7	62.7	70.1	91.0	100.0	46.3	98.5	100.0	94.0
Discomfort	Wrist & Fingers L	Hip/Buttocks	Thigh R	Thigh L	Knee R	Knee L	Lower leg R	Lower leg L	Foot R	Foot L
Slightly	1.5	1.5	0	0	3.0	7.5	3.0	1.5	4.5	1.5
Moderate	0	4.5	0	0	4.5	7.5	1.5	1.5	4.5	3.0
Very	0.0	4.5	0	0	1.5	1.5			1.5	4.5
Unbearable	0	0	0	0	0				4.5	1.5
None	98.5	89.6	100.0	100.0	91.0	83.6	95.5	97.0	85.1	89.6

The pain of the neck, shoulders, upper back and lower back was mostly rated as moderate by the respondents. The average responses for moderate pain were 25.4%, 27.9%, 7.5% and 17.9% respectively; while for unbearable pain were 1.5%, 3.0%, 3.0% and 9.0% respectively. For peripheral joints, the pain was mostly slight with an average experienced by an average of 3.2% respondents. Others had moderate pain of the knees, legs and feet; while unbearable pain was experienced at the feet (right side by 4.5% and left side by 1.5% participants).

### 4.3.3 Interference with ability to work

Table 4-3 below provides data on the extent to which the musculoskeletal disorders (pain) interfered with the ability to work.

**Table 4--3 Degree of interference with work**

Interference	Neck	Shoulder R	Shoulder L	Upper Back	Upper arm R	Upper arm L	LowerBack_3	Forearm R	Forearm L	Wrist & Fingers R
Not at all	1.5	1.5	1.5	6.0	1.5	0	3.0	1.5	0	1.5
Slightly	9.0	10.4	7.5	7.5	3.0	0	11.9	0	0	4.5
Moderately	20.9	26.9	22.4	11.9	1.5	0	17.9	0.0	0	0
Substantially	14.9	10.4	4.5	4.5	3.0	0	20.9	0	0	0.0
N/A	53.7	50.7	64.2	70.1	91.0	100.0	46.3	98.5	100.0	94.0

Interference	Wrist & Fingers L	Hip/Buttocks	Thigh R	Thigh L	Knee R	Knee L	Lower leg R	Lower leg L	Foot R	Foot L
Not at all	1.5	1.5	0	0	1.5	3.0	1.5	0	3.0	0
Slightly	0	1.5	0	0	4.5	7.5	3.0	1.5	4.5	3.0
Moderately	0.0	9.0	0	0	3.0	6.0	0	1.5	1.5	1.5
Substantially	0	0	0	0	0	0	0.0	0.0	6.0	6.0
N/A	98.5	88.1	100.0	100.0	91.0	83.6	95.5	97.0	85.1	89.6

Most respondents indicated that neck, shoulder, upper back and lower back pain moderately affected the ability to work (22.9%, 24.6%, 11.9%, and 17.9 % respectively). Those whose pain substantially affected the ability to work were 14.9%, 10.4%, 4.5% and 20.9% respectively. No respondent experienced pain of the peripheral joints which substantially affected the ability to work, except for pain of the feet which accounted for 5.97% of participants.

#### **4.4 The Chi-square Test**

##### **4.4.1 Relationship between prevalence and interference to work**

The p-values for prevalence of musculoskeletal disorders in relation to interference with work were calculated to establish the significance of the relationship.

**Table 4-4 P- values for Prevalence**

<b>Body parts</b>	<b>Chi-Square</b>	<b>P-value</b>
<b>Neck</b>	4.434	0.881
<b>Shoulder R</b>	13.254	0.151
<b>Shoulder L</b>	11.782	0.226
<b>Upper Back</b>	18.461	0.030
<b>Upper arm R</b>	5.000	0.544
<b>Lower Back</b>	21.341	0.011
<b>Wrist &amp; Fingers R</b>	0.444	0.505
<b>Hip/Buttocks</b>	9.778	0.134
<b>Knee R</b>	6.000	0.199
<b>Knee L</b>	7.667	0.264
<b>Lower leg R</b>	0.750	0.386
<b>Lower leg L</b>	2.000	0.157
<b>Foot R</b>	6.800	0.340
<b>Foot L</b>	6.167	0.187

P-values greater than 0.1 indicate that there is no significant relationship between the prevalence of pain and interference with work, that is, pain has no significant contribution to absenteeism. This implies that the pain prevalence of neck, shoulder, upper arms, wrist fingers hips, knees, lower leg and feet, has no significant contribution to absenteeism. The p-values of upper and lower back are less than 0.1 indicating a significant association between the prevalence of pain and the ability to work. Hence, back (upper, lower) pain significantly contribute to absenteeism.

#### **4.4.2 Relationship between level of discomfort and interference to work**

The p-values for level of pain discomfort caused by musculoskeletal disorders in relation to interference with work were calculated to establish the significance of the relationship.

**Table 4-5 P- values for Prevalence**

<b>Body parts</b>	<b>Chi-Square</b>	<b>P-value</b>
<b>Neck</b>	50.361	0.000
<b>Shoulder R</b>	23.833	0.005
<b>Shoulder L</b>	9.499	0.023
<b>Upper Back</b>	21.317	0.011
<b>Upper arm R</b>	13.500	0.141
<b>Lower Back</b>	38.238	0.000
<b>Hip/Buttocks</b>	8.400	0.078
<b>Knee R</b>	4.667	0.323
<b>Knee L</b>	6.500	0.165
<b>Lower leg R</b>	0.750	0.386
<b>Lower leg L</b>	2.000	0.157
<b>Foot R</b>	14.000	0.030
<b>Foot L</b>	7.500	0.277

The table above show a significant relationship between the level of discomfort due to pain of musculoskeletal nature and the interference to work for neck, shoulders, upper back, lower back hips and feet. Thus the level of discomfort in these areas significantly contribute to absenteeism. With the rest of the body parts, there is no significant relationship as the p-value is greater than 0.1.

#### **4.5 Posture and Ergonomics**

Random observations of seven nurses on the day shift, three pharmacists, five doctors, ten admin clerks and ten cleaners were done to assess the posture and ergonomics as they perform their duties. The findings are discussed below.

Five of the nurses repeatedly bent their backs and rotated to either the left and/or the right side while making the beds and when bathing patients. The same posture and movements were observed when attending to patients on the floor beds. When lifting and transferring patients, they slightly bend and use the upper

body and arms to lift or shift patients. Most beds are not height adjustable to assist with maintaining the correct posture.

The pharmacists dispense medicine from a counter which is at the level of the chest; thus when they write, the shoulders are elevated and the upper back slightly slouches over the counter. Those who pack medication in containers for the wards, do so seated with the table and the chair at appropriate height, that is, allowing the hips and knees to be at ninety (90) degrees when seated, shoulders relaxed and elbows bent at about 90 degrees while working on the table.

The doctors in out-patient department work mostly seated. The chairs are not height adjustable. Two of the doctors were short, hence the shoulders were in an elevated position as they were writing. When examining the patients, they had to use a portable step to be able to examine the patients properly. Two doctors seated in a slouched posture while maintaining the 90 degree angle of the hips and knees and the shoulders were in a protracted position. However, they maintained an upright posture as the bed, though non-adjustable, was appropriate height. One of the doctors was tall, therefore was slouching over the desk and when examining the patients.

Five admin clerks maintained an upright posture while working on the desk, with the elbows, hips and knees at 90 degrees. The chairs were height adjustable and provided good support for the back. Two of them, however, had the computer screen adjusted too high as the neck was not in neutral position but extended slightly. Five admin clerks working in the admissions office, sat on benches which had no back support, the hips and knees in an angle more than 90 degrees. The shoulders were elevated, and the computer screen was tilted high for three of them causing neck extension; while for the other three, the screen was at an appropriate level.

The work of the cleaners required repeated bending and twisting of the upper and lower back, repetitive shoulder movements and prolonged periods on their legs, either standing or moving short distances. The polishing machines required force to control their movements coupled with vibrations. The force however could not

be measured but was described by the participants as “heavy”. The handles of the polishing machines and the vacuum cleaners could be adjusted to the appropriate height to allow maintenance of upright posture.

#### **4.6 Conclusion**

The results show a high prevalence of musculoskeletal disorders of the neck, shoulders, upper back and lower back. The pain in these areas was mostly moderate, but those who indicated unbearable pain also indicated substantial interference with ability to carry out their duties. On the lower peripheral joints, the prevalence was high for the feet, followed by the knees and the hips. The feet had a higher level of discomfort leading to substantial interference to carry out duties than the knees and hips. The chi-square tests have assisted to establish how the pain as an indicator of musculoskeletal disorders, contributes to absenteeism. The observations indicated postures and ergonomics which posed a risk for musculoskeletal disorders. The next chapter will draw conclusions from the field study and make recommendations for future studies, and occupational health and safety of hospital workers.

## **CHAPTER 5**

### **CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

The purpose of the field study was an attempt to gain a deeper understanding regarding the impact of musculoskeletal disorders, which are characterised by pain of the muscles and the joints, on absenteeism. Data was collected and analysed as discussed in Chapters 3 and 4. Data collection process was conducted using the method proposed by Cornell University.

The human resources section and the occupational health clinic did not have data specific to absenteeism related to musculoskeletal disorders, but had general data on leave of absence due to sickness. Therefore, the information on absenteeism was drawn from the participants' responses. The conclusion of the study summarises the inferences made as a result thereof, and to put into perspective the impact of musculoskeletal disorders on the ability to work and/or absenteeism. Future research proposals will be considered.

#### **5.2 Recommendations**

In order to make recommendations, it is important to consider the limitation of this study, which will guide future research. The following were the limitations identified during the study:

- The information available from human resources on absenteeism gives the overall figures on sick leave without the identifying the reason for leave; as a result the study depended the responses of the participants. This may lead to recall bias.
- The data did not specifically classify the occupational groups; hence prevalence of musculoskeletal disorders in specific groups could not be established.

The above limitations can be addressed by developing a database on conditions leading to sick leave in the hospital so as to enable planning of appropriate

intervention programmes. The development of an occupational health and safety programme in the health care setting may be challenging, but worthwhile endeavour. A successful programme can be developed with time, commitment and availability of resources, to ensure that the health of the workers is secured. The process thus requires identification of the hazards for musculoskeletal disorders and their correlation with specific tasks according to occupational groups.

The development of educational programmes, which teach the proper use of body mechanics when performing tasks according to occupational groups is also recommended.

The literature review showed that poor ergonomics are not the only risk factors for musculoskeletal disorders, but factors such as psycho-social and environmental factors may contribute to absenteeism. Research is recommended to explore these areas.

Research on the prevalence of musculoskeletal disorders in different age groups is also recommended.

### **5.3 CONCLUSION**

Musculoskeletal disorders occurring as a direct result of the way tasks are carried out play a significant role in the time lost due to absence in the hospital. The result of the heavy work elements involved in the tasks performed, is the physical effort required and the static or dynamic skills that a person invests in the task. These, if not applied appropriately pose as risk factors to development of musculoskeletal disorders.

The high prevalence of musculoskeletal pain of the upper body parts (the neck, shoulder and back), and the level of discomfort leading to absenteeism, are consistent with the study by Widanarko, et al (2011:735). The authors established that 27% of approved health insurance claims were for work related



musculoskeletal disorders, and that the severity of the condition was the determinant of reduced capacity to perform duties and absenteeism.

It is however, worthy to note that participants who had moderate pain, mostly did not consider it to affect their ability to perform their duties. Presenteeism has been discussed in Chapter 2, indicating varying reasons why people would continue working while experiencing pain. The study by Bergström, Bodin, Hagberg, Lindh, Aronsson and Josephson, 2009b: 1181 has shown that people working in health care services have increased risk of being at work when sick, and this kind of presenteeism has been expected to be an independent risk factor of future poor health. Therefore, health care institutions should proactively assess the risks for injuries to the staff and reduce them to the lowest possible level.

A review by Krafft (2011:64-68) shows that improvement of the working space, that is ergonomics, resulted in the reduction of employee injuries associated with the type of work they do, reduced rate of absenteeism, and led to increased satisfaction and productivity.

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## APPENDIX A: BIOGRAPHIC INFORMATION

### Section A: BIOGRAPHICAL DETAILS

*The aim of the questionnaire is to determine the impact of musculoskeletal disorders on absenteeism among healthcare workers at Botshabelo District Hospital. Please note that your participation in this study is voluntary and you can withdraw from participating at any time. Your participation will be anonymous and*

#### 1. HOW LONG HAVE YOU BEEN WORKING AT THE HOSPITAL?

1-5 Years	
6 – 10 Years	
11-15 Years	
More than 15 years	

#### 2. AGE:

20 – 30 Years	
31 - 40 Years	
41 - 50 Years	
More than 50 years	

#### 3. GENDER:

Male	
Female	

#### 4. MARITAL STATUS

Single	
In a relationship	
Married	
Divorced	
Separate	
Remarried	

#### 5. EDUCATIONAL LEVEL:

Matric or less	
Matric + 1 year	
Matric + 3 years	
Matric + more than three years	

#### 6. LANGUAGE

Afrikaans	
English	
Sepedi	
SeSotho	
SeTswana	
TshiVenda	
IsiZulu	
IsiXhosa	
Other	

**7. LEVELS OF MANAGEMENT**

Manager/Supervisor	
Employee	

**8. CULTURE GROUP**

ASIAN	
AFRICAN	
WHITE	
COLORED	

# APPENDIX B: MUSCULOSKELETAL DISCOMFORT QUESTIONNAIRE

## Section B: Musculoskeletal Discomfort Questionnaire

(Please answer by marking the appropriate box with an 'x'.)

Body Parts	During the last <u>month</u> , how often did you experience ache, pain, discomfort in:				If you experienced ache, pain, discomfort, how <u>uncomfortable</u> was this?				If you experienced ache, pain, discomfort, did this <u>interfere with your ability to work</u> ?			
	1-2 times last month	3-4 times last month	Once every week	Several times every week	Slightly uncomfortable	Moderately uncomfortable	Very uncomfortable	Unbearable	Not at all	Slightly interfered	Moderately interfered	Substantially interfered – had to stay away from work.
Neck												
Shoulder	Right											
	Left											
Upper Back												
Upper Arm	Right											
	Left											
Lower Back												
Forearm	Right											
	Left											
Wrist and fingers	Right											
	Left											
Hip/Buttocks												
Thigh	Right											
	Left											
Knee	Right											
	Left											
Lower Leg	Right											
	Left											
Foot	Right											
	Left											