Factors Associated with Low Back Pain in Hospital Employees

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

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DECLARATION

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

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Benita Naudé

_________ day of ___________________ 2008

DEDICATION

To the Lord for guidance along the way;
to Hansie for his unbound optimism;
to my parents for a secure upbringing in an academic environment;
to my brothers, sister and friends for their never-ending support

ABSTRACT

Introduction

Low back pain can be influenced by demographic, lifestyle and co-morbid factors. No studies have been done on the relationship between these factors and low back pain in hospital employees in South Africa. The aim of this study was to determine which of these factors was present and how they influenced low back pain in staff employed at a district hospital in South Africa.

Methods

The study used a self-administered questionnaire on staff employed at the hospital.

Results

Results indicated that the point prevalence for low back pain was 47%.
Most of the employees were female nurses aged between 26 and 40 years with BMI values higher than normal. The majority of the employees participated in exercises although this was mainly for 1 to 2 times a week. Among the demographic factors, only female gender was associated with increased risk of low back pain (OR 1,67 CI 1,04 ; 2,69) while for the lifestyle factors, participation in group exercises was a protective factor against low back pain (OR 1,66 CI 1,02 ; 2,70). Perceived stress all the time increased the risk of low back pain (OR 3,47 CI 1,46 ; 8,23). None of the isolated co-morbid diseases were associated with the presence of low back pain.

Conclusion

The prevalence of low back pain among Tshwane district hospital employees is high. Female gender and a high level of perceived stress increase the risk of low back pain while participation in group exercise reduces the risk of low back pain.

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CHAPTER 1

1.0 BACKGROUND AND NEED

1.1. Introduction

In South Africa low back pain is a common health problem with a point prevalence rate of 35,8% and a lifetime prevalence rate of 63,9% (Van Vuuren et al., 2005). According to Louw et al. (2007) in Africa the mean point prevalence of low back pain in adults is 32% and the lifetime prevalence rate is 62%. Low back pain was established as the most common disabling disease in the UK, especially in working age adults (Royal College of General Practitioners, 1994). The prevalence of low back pain among hospital workers in an Italian hospital was found to be 58,8% (Folletti et al., 2005). In South African government hospitals in the Gauteng Province, a total number of 5727 low back pain cases were seen by 152 physiotherapists between the 1st of January and the 30th of August 2006 (Gauteng Department of Health, 2006).

Low back pain influences quality of life and causes physical and psychological distress (Van Vuuren et al., 2005). The consequences of low back pain are far reaching and lead to a negative economic impact, which includes an increased absence from work and lost productivity (Van Vuuren et al., 2005). Back pain has been found to place a huge load on healthcare resources in the National Health Service in the UK, as well as elsewhere (Klaber Moffet et al., 1995). Combined direct and indirect costs associated with low back pain were more than the estimated costs for lower respiratory tract infections, Alzheimer's disease, stroke, diabetes, multiple sclerosis, and epilepsy combined (Maniadakis and Gray, 2000).

It is widely accepted that low back pain has a multifactorial origin (Van Vuuren et al., 2005) and prevention becomes increasingly important. Factors associated with low back pain are occupation and population specific (Krause et al., 2001).

Common factors associated with low back pain include exercise, obesity, smoking, age and stress (Kwon et al., 2006). Lifestyle factors such as alcohol consumption and smoking have been found to contribute towards increased low back pain levels (Hestbaek et al., 2006). A strong association can be made between lifetime occupational exposure to heavy and frequently lifting and severe low back pain history (Saudicani et al., 1997; Matsui et al., 1994). However, these factors are amendable to change. Three to four exercise sessions per week may decrease the risk of developing low back pain (Kwon et al., 2006). Rest was until recently, prescribed for the treatment of low back pain. This, however, leads to increased disability (Kwon et al., 2006). Today it is clear that advice to stay active and an early return to work is considered more beneficial for acute and chronic low back pain (Stevenson and Hay, 2004; Frost et al., 2000). Early return to activities of daily living does not increase the risk of reinjury (Burton et al., 2005).

It has been established that between 2% and 33% of acute low back pain episodes develop into chronic low back pain (Violante et al., 2004). For this reason it is crucial to establish the risk factors in order to develop prevention programmes in the ongoing battle against chronic low back pain. Early active management may prevent an acute condition from becoming chronic (Cuzman et al., 2001).

Returning patients to optimal function after a low back pain episode can be done by incorporating important changes into their lifestyle (Frost et al., 2000). These include goal setting, activity pacing, exercise, ergonomics, education about the detrimental effects of rest and general deconditioning, and stress management (Frost et al., 2000). Lifestyle changes are important and patients should be encouraged to participate actively in taking control of their pain in order to reduce disability and psychological distress, improve general health, improve coping mechanisms, and return to work and activities of daily living. In short, patients should be equipped with the ability to manage their own pain in every day situations (McKenzie, 1990). These changes can be accentuated once the role-playing lifestyle factors are determined.

A number of studies on the prevalence and determinants of low back pain have been done in the developed world but little has been done in the developing world (Hestbaek et al., 2006). No studies have been done on the association of low back pain and demographic, lifestyle and co-morbid factors on a population of hospital employees in South Africa. In the search for a possible low back pain high-risk population – certain demographic, lifestyle and co-morbid factors may be the key factors for spotting the target group (Hestbaek et al., 2006). The aim of this study was to determine the factors that are associated with the presence of low back pain among staff employed at Tshwane District Hospital in Gauteng, South Africa.

1.2 Problem Statement

The influence of demographic, lifestyle and co-morbid factors on low back pain has not yet been established in staff employed in a South African hospital setting.

1.3 Research Question

Are certain demographic, lifestyle and co-morbid factors associated with the presence of low back pain among hospital employees?

1.4 Aim of the Study

To establish the demographic, lifestyle and co-morbid factors associated with the presence of low back pain among Tshwane District Hospital employees.

1.4.1 Objectives of the Study

- To establish the point prevalence of low back pain among employees of Tshwane District Hospital

- To establish the demographic, lifestyle and co-morbid factors among Tshwane District Hospital employees
- To establish the relationship between demographic factors and the presence of low back pain
- To establish the relationship between lifestyle factors and the presence of low back pain
- To establish the relationship between co-morbid factors and the presence of low back pain

1.5 Significance of the Study

Establishment of the demographic, lifestyle and co-morbid factors that are associated with low back pain can lead to better planning and implementation of preventative measures against low back pain among Tshwane District Hospital employees.

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 Introduction

The literature that was reviewed was sourced from the Medline, Pubmed, Cochrane, CIRRIE and Pedro databases. The following key words were used in the search strategy: low back pain, risk factors, and hospital staff.

Low back pain is multi-factorial in origin with physical, psychosocial, and individual factors contributing towards its manifestation (Panel on Musculoskeletal Disorders in the Workplace, 2001). All these mentioned factors need to be taken into consideration when reviewing possible risk indicators as well as other factors associated with low back pain.

The literature review was done using the following subheadings:

2.2 The definition of low back pain
2.3 The definition of lifestyle
2.4 The prevalence of low back pain
2.5 Demographic factors associated with low back pain
2.6 Lifestyle factors associated with low back pain
2.7 The effect of co-morbid diseases on low back pain
2.8 Review of the methodology
2.9 Conclusion

2.2 The Definition of Low Back Pain

An accepted gold standard definition of low back pain is required in order for this definition to be valid and at the moment such a definition for low back pain does not exist (Hartvigsen et al., 2003). Low back pain was defined by Kravitz and Andrews (2007) as pain in the lumbosacral area of the spine encompassing the distance from the first lumbar vertebra to the first sacral vertebra. This definition covers a small area of the lower back and might exclude a vast number of cases that may present symptoms higher or lower than the area specified by Kravitz and Andrews (2007).

William and Shiel (2007) defined low back pain as pain in the lower back area caused by problems with the lumbar spine, the intervertebral discs, spinal cord, spinal ligaments, nerves and muscles, or the skin covering the area. This definition was chosen as it describes the possible structural causes of low back pain. Eriksen et al. (1999) defined low back pain as pain below T12 and above the gluteal fold. Both these definitions were chosen as each emphasised an important aspect of low back pain. The definition of Eriksen et al. (1999) was chosen to describe the area of pain, and was combined with the definition of William and Shiel (2007) in order to define low back pain in this study.

2.3 The Definition of Lifestyle

According to the New Zealand Health Strategy (2000), lifestyle is a way of living based on identifiable patterns of behaviour consistent with the individual's choice, influenced by the individual's personal characteristics, their social interactions, and socioeconomic and environmental factors. Another definition given by the National Services Scotland (2007) says that lifestyle factors are those factors inherent in a patient's way of living that may have a significant effect on their propensity to ill health or the likely success of treatment. These may include the degree of smoking, alcohol consumption, or drug abuse, diet and exercise. Both these definitions were comprehensive and describe lifestyle and lifestyle factors very well and as such were adopted for use in this study.

2.4 The Prevalence of Low Back Pain

Low back pain is the most prevalent musculoskeletal condition in developing nations (Louw et al., 2007). Louw et al. (2007) did a systematic appraisal of 27 published prevalence studies conducted on the African continent. Sixty seven percent of these studies were methodologically sound and were analysed. They found that the low back pain point prevalence in adults was 32%, while the one year prevalence was 50%, and the lifetime prevalence was 62%. Louw et al. (2007) concluded that findings in the developing world support global findings and subsequent burden of low back pain.

Jeffries et al. (2007) reviewed epidemiological studies done all over the world on idiopathic adolescent low back pain and reported that lifetime prevalence rates ranged from 7% to 72%. Jeffries et al. (2007) reviewed studies which included adolescent populations which differed from that of Louw et al. (2007) who reviewed studies on adult populations. The results of these studies are very similar to each another. Jeffries et al. (2007) concluded that lifetime prevalence rates of low back pain increase steadily with age and reach that of adult levels by the age of 18 years.

In their study on low back pain prevalence, Schneider et al. (2005) included 3 488 persons between the ages of 18 and 69 years working in Germany. The seven-day prevalence for back pain in the German working population was 34% and the one-year prevalence was 60%. Schneider et al.'s (2005) study included Germans only in their population and their point prevalence rates closely match what was found by Louw et al.'s (2007) study done on the African continent. However, Schneider et al. (2007) did not specify what area of back pain they were investigating, therefore the actual prevalence of low back pain in the German population may be lower when compared to what was found on the African continent.

Low back pain was also found to be common in Ireland. A low back pain lifetime prevalence rate of 46%, an annual prevalence rate of 30% and a point prevalence rate of 15,5% were established among Irish health service workers (Cunningham et al., 2006). These prevalence rates were much lower than what was found by Louw et al. (2007) in studies done on the African continent. Results found in a South African study among 366 steel plant workers showed that 35,8% of participants suffered from low back pain (Van Vuuren et al., 2005). This corresponds to Louw et al.'s (2007) findings and is also higher than what was found by Cunningham et al. (2006) among Irish health workers. To confirm the universality of the low back pain problem, Kelsey et al. (1992) established that at least 60% of the United Kingdom (UK) population had experienced low back pain in their lifetime, while five to ten percent of patients suffered from long-term or permanent disability resulting from low back pain (Kim et al, 2006). Between 2% and 34% of patients with acute low back pain go on to a chronic state (Coste et al., 1994 and Thomas et al., 1998)

Low back pain point as well as lifetime prevalence rates vary between different population groups and studies done in different countries. Lifetime prevalence rates in Africa and South Africa are high when compared to other countries in the world.

2.5 Demographic Factors Associated with Low Back Pain

2.5.1 Age

Alcouffe et al. (1999) regarded age as the main risk factor for the presence of severe low back pain. They compared different factors in men and women with and without low back pain, and found that older age remained a risk factor common to men and women when analysed by sex. This factor cannot be acted against, since it cannot be prevented, but it is important to assess occupational risk factors involved before aging takes place (Alcouffe et al., 1997).

In a cross-sectional survey done by the Australian Bureau of Statistics (2001) prevalence statistics suggest that 16% of people in the 15 to 24 year age group, and 18% of those in the 25 to 34 year age group suffer from low back pain. They found that the higher age group correlated with a higher prevalence of low back pain. This may be as a result of disc degeneration that occurs with ageing, but could also be as a result of the number of years of exposure to environmental circumstances that are detrimental to the back (Hangai et al., 2007). In a systematic review done by Steenstra et al. (2005) it was determined that the duration of sick leave as a result of low back pain increases with increasing age, especially with age above 51 years.

Even though age may be an unchangeable prognostic factor, it should motivate employers to ensure proper ergonomics in the workplace or even for a change of job for older employees so that the frequency and intensity of daily loading on the spine is decreased (Van den Hout et al., 2003). In the end this may lead to faster return to work after sick leave due to low back pain as employees will feel that they are returning to an environment that facilitate protection of the lower back (Van den Hout et al., 2003).

Contrasting results on the influence of age on low back pain were found by Kwon et al. (2006). In their study, persons younger than 19 years of age were excluded from the study and their population was divided into groups according to age that is: 20 to 40 year olds, 40 to 50 year olds and older than 60 years. A large population of 772 hospital-visiting patients participated in the survey. They found that there was no statistically significant correlation between low back pain and age when other variables, like obesity, smoking, level of exercise, educational level and level of stress, were constant. The reason for these contrasting results may be because the population consisted of males only.

Age is an unchangeable prognostic factor for the development of low back pain. According to most of the literature reviewed in this study, age is a risk factor due to degeneration but also due to the number of years of exposure to an environment which is detrimental to the lower back.

2.5.2 Gender

The effect of gender on the prevalence of low back pain has produced conflicting results over the years. Burdorf and Sorock (1997) reviewed 35 publications on work-related disorders and found that gender was not associated with the presence of low back pain. In contrast to what was found by Burdorf and Sorock (1997), Alcouffe, et al. (1999) reported that symptoms of low back pain were more prevalent in women (58,2%) than in men (52,7%), although women seemed to be less exposed to known occupational risk factors. Low back pain with or without referred pain above or below the knee was associated with the female sex (Alcouffe et al., 1999). Schneider et al. (2005) also established that among the German working population the chances of developing low back pain if you were female were significantly higher when compared to males while at the same time being married increased the odds even more.

Kwon et al. (2006) postulated that low back pain in women might be associated with gyneacological conditions, and that it is important to study males and females separately. Low back pain during pregnancy is another common problem and 72% of pregnant women with low back pain take sick leave as a result of low back pain (Mogren, 2006). It was also shown that women tended to return to work slower than men after an episode of acute low back pain (Steenstra et al., 2005).

The reason why more women than men suffer from low back pain could be due to their higher reporting of somatic symptoms, better ability to recall previous incidences of low back pain, poorer perceived physical health, increased pain perception and decreased inhibition (Barsky et al., 2001). During the socialisation process, starting in early childhood, boys are taught to be less expressive and not to admit weakness, pain and distress. It is thus more socially accepted for women to report pain and disability (Barsky et al., 2001). Household activities may be a causative factor for low back pain. This may be another reason why more women suffer from low back pain and may be true even though men used to perform more physical occupational duties than women (Alcouffe et al., 1999).

It is important to assess factors that influence the risk of developing low back pain separately for men and women. The different genders may be exposed to different causative agents for low back pain, resulting in different prevalence rates of low back pain as well as responses to low back pain.

2.5.3 Body Mass Index (BMI) measurements

BMI is defined as the weight in kilograms divided by the square of the height in meters (Harcourt Health Sciences Company, 2001). It is used in the determination of whether one is underweight, or has a normal weight or is obese. The appropriate BMI, as classified by Crook et al. (2001) for people between 19 and 34 years of age is 19 to 25kg/m^2. For people above the age of 35 it is between 21 and 27kg/m^2. Mild to moderate obesity is classified when a BMI of above 27.5kg/m^2 exist, and morbid obesity when the BMI is above 40kg/m^2.

It was found that BMI was not significantly associated with low back pain (Alcouffe et al., 1999; Mirtz and Greene, 2005; Foppa and Noack, 1996). Andrusaitis et al. (2006) also found no relationship between height, weight or BMI and the occurrence of low back pain. Kwon et al. (2006) collected data from a large population of 772 participants in Korea. They excluded all persons with signs and symptoms suspicious of a particular disease, as well as all females. A comparison was drawn between low back pain and BMI, although only 80 participants (10,4%) suffered from low back pain. A BMI of less than 23 was classified as normal, 23 to 25 as overweight and above 25 as obese. The margin for being in the overweight to obese category was much lower in this study than what was classified by Crook et al. (2001) and this might have led to a higher prevalence of overweight or obese participants. Their study however found no correlation between BMI and low back pain.

Battie et al. (1989) conducted a prospective study of risk factors for industrial back pain among 3020 aircraft manufacturing employees. Back problems were reported by 279 employees, but this was not found to be associated with obesity, even after subsequent follow up for several years. In contrast to these findings, Deyo and Bass (1989) found that there was a greater prevalence of low back pain with increasing BMI, and prevalence was substantially higher in the most obese 20% of subjects after analyzing data collected in a national survey in the United States. These results were found using a logistic regression, after controlling for age, education, exercise level, and employment status.

In another study done in the United States, Hurwitz and Morgenstem (1997) found that a BMI above the mean is associated with low back pain in the adult population. They concluded that even though the magnitude of their associations was not large, it may have huge public health implications because of the high prevalence of back problems, resultant disability and the association with a high BMI. There is evidence that BMI is a prognostic factor for duration of sick leave taken by employees. Steenstra et al. (2005) found that an above mean BMI was associated with longer duration sick leave in people suffering from low back pain. A combination of above average height and unfavourable ergonomic conditions were established as factors that account for a higher chance of developing low back pain (Han et al., 1997).

Although it is hypothesised that the mechanisms by which obesity influences low back pain include mechanical and metabolic abnormalities, current evidence to establish these mechanisms is inconclusive. The relationship between obesity and low back pain may not be direct, but may be influenced by lifestyle choices, like smoking, alcohol consumption and being sedentary (Janke et al., 2007).

2.6 Lifestyle Factors Associated with Low Back Pain

2.6.1 Smoking

According to the National Youth Risk Behaviour Survey (NYRBS) (2002) 41,4% of people in Gauteng have smoked a cigarette sometime during their lifetime, even one or two puffs. This is a high percentage despite ongoing education on the dangers of smoking.

Smoking may lead to reduced perfusion and malnutrition of tissues (Kaupila, 1995) which may interfere with the healing process (Eriksen et al., 1999). In adults blood supply to the intervertebral discs takes place through diffusion from the adjacent cartilaginous end plate surrounding these discs. A decrease in blood circulation affects the cellular uptake and solute exchange capacity and this may reduce the levels of collagen and proteoglycan – the main constituents of the disc (Iwahashi et al., 2002). Another reason why smoking is associated with low back pain may be as a result of nicotine's effect on the central nervous system which results in an increased perception of pain (Eriksen et al., 1997).

Eriksen et al. (1999) analysed data from a community-based four-year prospective study which included 2 726 respondents. They found that heavy lifting and long time standing was a predictor for low back pain in smokers, even after adjusting for age, gender, and physical exercise. This was not the case in non-smokers. Smoking was also identified as a risk factor associated with low back pain among women (Alcouffe et al., 1999). In two other studies Alcouffe et al. (1997) and Tsai et al. (1992) found that smoking was a risk factor for low back pain in both sexes. Strong evidence exists that smoking increases the duration of sick leave due to low back pain (Steenstra et al., 2005).

However in contrast to these studies' findings, Kwon et al. (2006) found no statistically significant correlation between smoking and low back pain. In their study, eighty participants (10,4% of their study population) suffered from low back pain. Thirty one percent (25) of these participants were current smokers who suffered from low back pain. The reason for the contrasting findings might be the small number of participants suffering from low back pain and at the same time being smokers, when compared to Eriksen et al.'s (1999) population. Another explanation could be that Kwon et al. (2006) did a cross-sectional study, while Eriksen et al. (1999) did a four-year prospective study which might have given more accurate results.

Contrasting results were found on the influence of smoking on low back pain. Despite this finding, it is generally agreed that smoking is detrimental to one's health.

2.6.2 Alcohol consumption

According to the South African Demographic and Health Survey (SADHS) (1998) 20,6% of females and 49,5% of males in Gauteng consumed alcohol. Andrusaitis et al.'s (2006) study on risk factors for low back pain established that 45,9% of individuals suffering from low back pain consumed alcohol. This was however not a statistically significant outcome. Leboeuf-Yde (2000) did a review of nine original research reports published between 1987 and 1995. It was concluded that alcohol consumption did not seem to be linked to low back pain, but that well-designed specific alcohol/low back pain studies are lacking. High quality literature on the relationship between low back pain and alcohol consumption is scarce and a conclusion is thus difficult to make.

2.6.3 Participation in physical activities

In a study which was done by the National Youth Risk Behaviour Strategy (2002) it was found that 31% of Gauteng youth participated in insufficient physical activity. Kwon et al. (2006) found that levels of exercise influenced the development of low back pain. People who exercised three to four times per week as well as those who exercised five to six times per week, had a lower chance of developing low back pain than those who exercised one to two times per week and those who did not exercise at all (Kwon et al., 2006). They referred to physical exercise as time spent doing physical activity that is not part of daily occupational or domestic tasks. These results were obtained by self-reporting of participants which renders them to the possibility of biased answers.

Stevenson and Hay (2004) found that the use of rest in the treatment of low back pain led to increased disability. It is for this reason that it is more beneficial for people with low back pain to stay active. Strengthening and mobilisation exercises of the back are believed to protect it by increasing blood supply to the spine muscles and joints, and intervertebral discs. This minimises injury and enhances repair. They are also believed to alter the perception of pain by increasing a positive frame of mind (Burton et al., 2005; Tveito et al., 2004). The specific type of exercise which is protective for the back has not yet been determined (Tveito et al., 2004). Kwon et al. (2006) also said that it is unclear if it is necessary to reduce body weight to a normal level for exercises to be effective as a preventative measure for low back pain. Steenstra et al. (2005) described physical fitness as being active in sporting activities and this was established as not being a prognostic factor for the duration of sick leave taken for low back pain (Steenstra et al., 2005).

2.6.4 Occupational activities

The literature in this section will be discussed under the sections of: the type of occupation, daily time spent sitting, standing and walking by participants, and heavy physical duty especially lifting.

2.6.4.1 Type of occupation

Occupational low back pain refers to pain which develops while the individual is doing occupational activities like repetitive lifting and tilting of the trunk (Miyamoto et al., 2000). These factors, as well as the duration of exposure, may be seen as risk factors in the development of low back pain (Burdof et al., 1993). A strong association can be made between lifetime occupational exposure to heavy and frequently lifting and severe low back pain history (Saudicani et al., 1997; Matsui et al., 1994). Increased work pace also plays a significant role in the causation of low back pain (Hartvigsen et al., 2001).

In a cross-sectional questionnaire based study done in Italy by Violante et al. (2004), 95% of the respondents reported high-risk occupational activities such as manual handling of patients. Violante et al. (2004) also found that 95% of all the respondents were females. The prevalence of back disorders in this study were 44% among nursing staff and it was 19% for acute low back pain, 17% for chronic low back pain and 8% for diagnosed lumbar disc hernia.

One of the most common occupational health problems in nursing is musculoskeletal disorders (Ando et al., 2000). Seventy two percent of Korean hospital nurses experienced low back pain and nurses who reported manual handling of patients were 7,2 times more likely to report musculoskeletal symptoms (Smith et al., 2005). The prevalence of back disorders among nursing staff was found to be 36% and 63% in the Netherlands and Cape Town (South Africa) respectively (Botha and Bridger, 1998; Engels et al., 1996). Engels et al. (1996) found that physical variables which seem to elicit symptoms of low back pain in subjects the most, were lifting (65%), working in awkward postures (47%), stooping (34%) and poor ergonomic layout of the ward (53%). Sun et al. (2007) also found out that the prevalence of low back pain was 87% in ICU nurses and 64% in nurses working in other wards in a Chinese hospital study involving 4 077 employees. The compressive force on the disc between the L5 and S1 vertebrae was calculated with Bless Pro software and was seen to be the highest during observation of drainage, lifting and transferring of patients in bed, injection and suctioning (Sun et al., 2007).

Exposure to occupational activities can be seen as a risk factor for low back pain. Heavy and frequent lifting was of most concern especially amongst the nursing staff.

2.6.4.2 Daily time spend sitting, standing and walking by participants

Moderate loads applied to the spine during sitting, standing and walking, seem to be protective, while either too much or too little load might provoke pain and disability (Winkel, 1986). Schneider et al. (2005) analysed information from the first National Health Survey of the Federal Republic of Germany. A total of 3 488 people aged between 18 and 69 years participated in the study and it was found that sitting for long periods of time is a risk factor for low back pain. Continuation of prolonged positions (Miyamoto et al., 2000) or fixed postures for more than four hours per day (Violante et al., 2004) were established as risk factors for low back pain in two other questionnaire based studies.

In another questionnaire based survey, Hartvigsen et al. (2003) collected information from 29 433 individuals (11 992 pairs) in a twin control study in order to examine the association between self reported physical workload and low back pain in Denmark. They found no difference on the effect of mostly sitting at work, and both sitting and walking at work on the development of low back pain. These findings were also supported by Fransen et al. (2002) in a self-administered questionnaire based prospective cohort study. They reported that sitting and walking were not predictors for duration of sick leave among employees.

Panjabi (1992) proposed that the lumbar spine is continuously in a neutral zone during sitting and that the stabilising muscles' function become more important than the use of ligaments and tendons. Weak stabilising muscles may increase unnecessary load on the ligaments and tendons in sustained positions, which renders the individual susceptible to pain. The literature gives conflicting results on the influence of sitting, standing and walking on low back pain.

2.6.4.3 Heavy physical duty: lifting

During strenuous repetitive mechanical work, structures associated with the vertebral column are placed under tension. According to the Panel of Musculoskeletal Disorders and the Workplace (2001), the biomechanical load tolerance model of musculoskeletal disorders manifests as a result of an imbalance between load and tolerance. They described “load” as physical stresses imposed on the anatomical structures of the body, for example kinetic (motion), kinematic (force), oscillatory (vibration) or thermal energy sources and “tolerance” is described as the capacity of the body to endure load through physical and physiological responses. An imbalance between load and tolerance caused by heavy physical duty may cause degenerative disc changes (Riinimaki et al.,1990) which may be the primary cause of non specific low back pain.

Lifting of more than 10kg was reported as a risk factor for low back pain in both males and females (Alcouffe et al., 1997). Heavy, frequent physical work and repeated rotation of the trunk were also associated with low back pain (Hoogendoorn et al.,1999; Burdorf and Sorock, 1997). Hoogendoorn et al. (1999) did a systematic review in order to assess aspects of physical load during work and leisure time as risk factors of low back pain and found that handling manual materials, bending and twisting were notable risk factors. Similarly, Burdorf and Sorock (1997) reviewed literature on work-related back disorders and found that lifting or carrying loads and frequent bending and twisting was consistently associated with low back pain. Linked to that was also the finding that lifting loads of any weight increases the risk of sick leave due to low back pain (Hoogendoorn et al., 2002). A significant positive association between duration of sick leave due to low back pain and heavy work was established by Steenstra et al. (2005).

In a twin control study, Hartvigsen et al. (2003) concluded that increased workload and subsequent increased lower back load, is a risk factor for low back pain of longer duration (more than 30 days), but probably not for low back pain of shorter duration. They implied that there must be different causal mechanisms present for the two subgroups, but did not specify the mechanisms proposed. They also indicated that the influence from physical workload might be greater than the influence of genetics on low back pain of longer duration.

It is clear from the literature that frequent and heavy lifting and loading of the spine increases the presence of low back pain. There should be a balance between the weight of the load placed on the spine and the ability of the spine to tolerate the load.

2.6.5 Perceived stress

Safety, physical environment and ergonomics were found to be occupational stressors (Chen et al., 2005). A relationship was found between psychological stress in the workplace and low back pain (Gonge et al., 2001; Linton, 2001). Psychosocial factors may cause increased muscle tension which may in turn lead to altered spinal loading. As a result of the latter, nutrition of the intervertebral discs, nerve roots and other spinal tissues are affected (Bongers et al., 1993; Bergenudd and Johnell, 1991).

It was postulated that raised plasma cortisol levels may leave muscles vulnerable to injury due to mechanical loads and hence increased susceptibility to low back pain (Theorell et al., 1993). It is also believed that pain tolerance may be decreased due to stress among people living in poor psychosocial environments, and those affected may be inclined to take more sick leave due to low back pain (Nachemson, 1992; Burton et al., 1997).

According to Feuerstein et al. (1999) there is a significant and strong positive association between stress at work and the presence of low back pain. This was established through comparing 174 United States Army soldiers diagnosed with lumbosacral strain with a control group consisting of 173 non-affected soldiers in a questionnaire based study. Elfering et al. (2002) analysed information collected by the use of questionnaires from 141 nurses in Switzerland. They reported that a lack of control over stressful events at work, as well as lack of time control, may render an individual vulnerable to musculoskeletal pain.

Kwon et al. (2006) found that the development of low back pain was not dependent on the level of stress. In their study, they divided the respondents into groups of: no stress at all, slight stress, moderate stress and a great deal of stress. Mental symptoms such as depression concurred with chronic diseases. For this reason they doubted that mental stress is a cause of low back pain, but may be as a result of chronic suffering from low back pain. However, in their study, people showing the slightest sign or symptom of systemic disease, diagnosed or undiagnosed, were excluded. This decreased the influence of chronic co-morbid diseases on the presence of low back pain, and a purer result could be obtained. Three other studies found no significant association between stress at work and the presence of low back pain (Ready et al., 1993; Gonge et al., 2001; Yip, 2002).

Stress at work causes raised plasma cortisol levels which may render an individual vulnerable to low back pain. Low back pain might be a result of psychosocial factors and likewise stress might be a result of chronic suffering from low back pain

2.7 The Effect of Co-Morbid Diseases on Low Back Pain

Co-morbid diseases have been associated with low back pain (Ritzwoller et al., 2006). Prevalence estimates for low back pain in patients with diabetes ranged from 4,8% to 5,1% (Ritzwoller et al., 2006). A psoas abscess is a common occurrence in patients with diabetes mainly as a result of secondary infections following staphylococcal colonisation (Kao et al., 2001). A patient with a psoas abscess, usually present with fever, hip or back pain (Kao et al., 2001). A psoas abscess is just one cause of low back pain in patients with diabetes. Spinal epidural abscesses are also associated with diabetes (Reihsaus et al., 2000). One of the symptoms of spinal epidural abscesses is localised back pain (Balwin et al., 1985).

Ritzwoller et al. (2006) found that the range of prevalence estimates of low back pain for patients with hypertension varied between 17,6% and 24,4%. Possible causes of low back pain associated with hypertension may be disc degeneration as a result of altered blood circulation due to vascular constriction, carboxyhemoglobin generation, atheroma formation and cellulose dissolution problems (Holm and Nachemson, 1988).

Ritzwoller et al. (2006) also established that 4,4% of patients with low back pain suffered from rheumatoid arthritis. Rheumatoid arthritis may cause pain in various joints, including the lower back.

Diabetes, hypertension and arthritis are co-morbid diseases which affect a person's general health. Other co-morbidities not discussed above may also play a role in the development of low back pain (Stewart et al., 1989). Each of these diseases influences the lower back by means of different causal mechanisms.

2.8 Review of the Methodology

Self-reporting of low back pain in self-administered questionnaires has been found to have good reliability in test-retest analysis (Walsh and Coggon, 1991). Holstrom and Moritz (1991) analysed the correspondence between answers to a questionnaire and answers on the same questions in a personal interview on low back pain. Sixty three percent of participants, who reported no lifetime low back pain in the questionnaire, reported the same during the personal interview.

According to Bombardier (2000), the most common method of gaining information for estimating the prevalence of low back pain, is through self administered questionnaires. Eriksen et al. (1999) used the standardised Nordic

Questionnaire to measure musculoskeletal pain without adapting or modifying it, while Galukande et al. (2006) used a validated Oswestry instrument to collect data. They modified and adapted it to their data collection needs.

Eriksen et al. (1999) provided their respondents with a checklist of body regions (head, neck, shoulder, elbow, hand, upper back, lower back, hip, knee, and ankle/foot). Respondents had to tick the areas where pain was present. A mannequin was used to describe low back pain, by shading the area between the twelfth rib and the gluteal folds. Using a pain drawing or mannequin has been reported as a reliable measure as part of an instrument to report self-reported pain (Margolis et al., 1988). The construct validity of this approach has been proven effective and is well published (Pope et al., 1997; Thomas et al., 1998). In the detection of pain there is no objective pathological information for comparison and results are based on the subjects' self report (Galukande et al., 2006).

Tousignant et al. (2002) used the method of observation of heavy physical work, lifting and forceful movements, bending and twisting (awkward postures) whole-body vibrations, static work postures (sitting and standing) and unexpected movements to collect ergonomic data for their study. It took three hours of observation of each participant, and in order to compensate for time constraints, two observers were used, which may be a source of random error. Rossignol and Baetz (1987) state that the results found in the literature for the average duration of time spent standing, sitting and lifting may be questioned as there is poor agreement between observational data and self-administered questionnaires. Due to time and human resource constraints, the method of observation was not used to collect ergonomic data in this study.

There are various ways to collect information on factors that may influence low back pain. No standardised and validated instrument could be found that could be used to collect the data needed to answer the objectives in this study. A suitable instrument, in the form of a self-administered questionnaire, was developed for this reason. It was a reliable method to use when compared to a personal interview. A mannequin was used as it is a clear and simple way to describe the area of pain. The area between the twelfth ribs and the gluteal folds was shaded to illustrate the area of pain.

2.9 Conclusion

The point prevalence of low back pain in South Africa is between 12% and 35% and the lifetime prevalence is between 30% and 80%. There is conflicting evidence in the literature on the association of a high BMI with low back pain. Older age, the female sex, nursing as an occupation and heavy physical duty are associated with the development of low back pain. Participation in physical activities more than three times per week is protective to the lower back. A balance should exist between prolonged sitting, standing and walking, as either too much or too little can be a cause of low back pain. Stress is associated with low back pain but this may be due to its association with other chronic diseases. The literature shows that there are contrasting results on smoking and its association with low back pain. Estimates for low back pain associated with co-morbid diseases like diabetes, hypertension and arthritis are low. There is a correlation between older age and the female sex and the presence of low back pain.

CHAPTER 3

3.0 METHODOLOGY

3.1 Study Design

This was a cross-sectional study using a self administered questionnaire.

3.2 Study Population

3.2.1 Source of subjects

The sample for the study comprised of staff members employed at Tshwane District Hospital in Pretoria.

3.2.2 Sample Selection and Size

A sample of convenience was derived from all staff employed at Tshwane District Hospital.

3.2.2.1 Inclusion Criteria

- Staff members permanently employed at Tshwane District Hospital

3.2.2.2 Exclusion Criteria

- Staff members who were not willing to participate in the study
- Students and casual workers at Tshwane District Hospital
- Staff members under 18 years of age

3.3 Measuring Instruments

3.3.1 The questionnaire

A self-administered questionnaire was developed for this study. The development of the questionnaire was based upon known risk indicators for low back pain as described by Kwon et al. (2006). The following items were taken from Kwon et al.'s (2006) questionnaire and adapted to meet the objectives of this study: age, obesity, frequency of exercise, level of stress, general health, extent of smoking and alcohol consumption, and the presence of low back pain. Questions on gender, form of exercise, occupation, hours spend sitting, standing and walking per day, heavy physical lifting, sick leave, and management of low back pain were included. The questionnaire went through a validity and reliability process (see 3.3.2 and 3.3.3).

The questionnaire comprised the following sections:

3.3.1.1 Patient (demographic) information

This section collected information on participants' height and weight. These were then used to calculate participants' body mass index. Information on the age and gender of the participants was also collected.

3.3.1.2 Recreation

This section collected information on the form of exercise the participants engaged in. The options participants chose from included walking, running, group exercise or sport, other exercise or no exercise at all. The frequency of exercising was also established.

3.3.1.3 Occupation

This part of the questionnaire gathered information on the occupations of the participants as well as the departments in which they spent most of their time. The amount of time spent in sitting, standing and walking at work as well as the amount of lifting of objects and/or people was asked. The participants also had to specify the frequency of personally perceived stress they experienced at work.

3.3.1.4 General health

The general health part of the questionnaire asked participants if they suffered from diabetes, hypertension, arthritis or any other disease. Sick leave taken as a result of low back pain was also asked for from the participants. Questions on whether participants consumed alcohol or smoked were also asked.

3.3.1.5 Presence of low back pain

This section asked participants whether they were experiencing low back pain at the time of the study or had experienced low back in the past. The section also sought information on how the pain was managed (in the past) or is being currently managed. The duration of past low back pain in the past was established. A "mannequin" with a shaded area between T12 and above the gluteal fold was used in order to help define low back pain visually (Eriksen et al., 1999).

3.3.2 Validity

Physiotherapy experts in the field of back care and management were consulted to establish the content and construct validity of the questionnaire. A draft of the questionnaire was set up according to known risk indicators as specified by Kwon et al. (2006). The questionnaire was sent to the experts and their input and suggestions were incorporated into the final questionnaire. The criteria used to classify a physiotherapist as an expert included that they had to be a qualified for four or more years, had to be working in the musculoskeletal field, and had to have a relevant post-graduate qualification.

The English questionnaire was translated into Tswana (see Appendix E and F for outline of questionnaires) by three translators, and back translated into English again by two other translators. The translators were not professional translators, but were fluent in English and Tswana. A discussion between the researcher and the five translators were held in order to clear any areas of disagreement in the questionnaire.

3.3.3 Repeatability of the questionnaire

The repeatability of the questionnaire was established using the test re-test method to establish intra-rater reliability. A total of ten employees were asked to complete the questionnaire and a second test was done after five days. It was decided to let five days pass by to decrease the effect of memory by the time the questionnaire was completed again. As answers to questions like cigarettes smoked per day, alcohol consumed and number of times exercised per week, may change from day to day, it needs to be interpreted with caution. Agreement on all the questions, that could not be changed from day to day, existed. Examples of questions on information that change from day to day are the number of exercise sessions per month, cigarettes smoked per day, hours spend sitting and standing, and number of units of alcohol consumed per week. Differences were found in some of the questionnaires regarding this information.

3.3.4 The Tanita Scale

This is a digital large capacity weight scale (Tanita HD351) that measures weight in kilograms. It can measure weight of up to 200 kilograms and is accurate within a range of 0,1 kilograms. A Tanita scale was also used in a study done by Berry et al. (2007). Re-calibration of this instrument was done by the researcher before the commencement of each day's data collection by measuring a 10kg packet of sugar. The same packet of sugar was used every day to maintain consistency with the calibration.

3.3.5 Tape measure

Units of measurement of the tape measure were millimetres and centimetres. It is attached to two pieces of Perspex: a foot section on which the person being measured stands, and a part which is put level on the person's head.

3.4 Procedure

Permission to conduct this study was obtained from the Superintendent of Tshwane District hospital (Appendix H). A summary of the staff establishment (showing the number of employees in each department) of Tshwane District Hospital was obtained from the human resource department.

Arrangements were made to conduct the study on a date and time when most staff members from each department were available to participate. The department as a whole was given the study information and employees had the opportunity to make an informed decision on whether to participate in the study.

3.4.1 Pilot Study

3.4.1.1 Objectives of the pilot study

A pilot study was conducted to test the participants' understanding of the informed consent form, the data collection instructions, the wording of the questionnaire, the repeatability of the questionnaire and to establish the time it took to complete the questionnaire.

3.4.1.2 Methodology of the pilot study

Information on the importance of the study, what to expect when participating, the benefits of participating and confidentiality of information collected were provided verbally. An information sheet containing the same information that was provided verbally was handed out to participants. The participants then signed the informed consent form if they agreed to participate in the study. Ten participants from different departments at Tshwane District Hospital were asked to complete the questionnaire. Questionnaires were taken back immediately after completion. Five days later the questionnaire was completed by the same ten participants. The individual results were compared to the previous attempt.

3.4.1.3 Results of the pilot study and implications

The understanding of the informed consent form was sufficient according to reports received from those taking part in the pilot study and no questions were raised by the participants. Shortcomings that were identified in the questionnaire by the participants included the fact that the questionnaire had no option for those who had not taken any sick leave in the past 12 months. Another inadequacy that was found was that it was not specified that only one department in which they currently work should have been chosen as some worked in more than one department. The questionnaire was adapted accordingly. It took between seven and nine minutes to explain the informed consent form, and between seven and ten minutes to complete the questionnaire.

3.4.2 Main Study

Permission was sought from the head of each department. On the date and time agreed upon by the examiner and head of each department, the information sheet (Appendix A and B) and consent form (Appendix C and D) were discussed with all the staff members of each department in groups of not more than 10. It was emphasised that the study was for those with and without low back pain. The first 10 staff members to enter the room became the first group from that department to participate in the study. Because the same information and questionnaire were given to all participants, randomisation was not important. In departments where more than ten employees worked, groups consisting of 10 participants, were given the opportunity to participate one after the other on the same day. It was decided to give the opportunity to participate in groups of no more than ten participants to ensure control when questionnaires were being filled in. The researcher will then be able to prevent discussion of the questions amongst group members and to be able to answer questions that would come up during the questionnaire completion session. Written consent was obtained from staff members who were willing to participate.

Participants were then measured for weight and height in order to determine the BMI. Weight and height were measured barefoot in work clothes. Measurements were taken against the wall in the venue where the data collection took place. As soon as the whole group's weight and height measurements had been taken, the questionnaire was given to each participant. Participants were given the opportunity to complete the questionnaire within the same venue. Participants were not allowed to discuss questions with one another in order to prevent participants influencing each other's responses and to ensure honest answers. If they did not understand a question they were allowed to ask the researcher for clarification. Each participant was only allowed to fill in one questionnaire. Questionnaires were collected immediately afterwards. All information was collected and all measurements were taken by the researcher.

3.5 Ethical Considerations

Ethical clearance was applied for and granted by the University of the Witwatersrand Human Research Ethics Committee (Number M070359) prior to commencement of the study (Appendix G). Participants were asked to voluntarily sign the consent form and were told that refusal to consenting to take part in the study would not affect them in any way. To ensure confidentiality of the identity of the participants, codes were used instead of names on all questionnaires. Confidentiality of the participants was also ensured by keeping the codes separate from the names.

3.6 Data Analysis

The Stata Release 8.0 statistical software was used in the analysis of the data from this study. Categorical parameters were summarised using frequencies, percentages and cross-tabulations. Means and standard deviations were determined for the following demographic factors; height, weight and BMI (continuous parameters). Comparison between low back pain categories (yes, no) with respect to categorical parameters employed Fisher's exact and tests for trends in odds ratios employed Pearson's chi-square test.

Univariate analysis (independently) and odds ratios for potential risk factors for low back pain were determined and tested for trend, i.e. if prevalence of low back pain increased with an increase in severity of risk (exposure). If one is not included into the 95% confidence interval for the odds ratio, then the odds ratio is significant. From the 95% confidence interval we conclude with 95% certainty that the true but unknown odds ratio falls between these limits. Testing was done at the 0.05 level of significance. BMI was calculated using the formula weight (in kilograms) divided by height (in meters) squared.

CHAPTER 4

4.0 RESULTS

4.1 Introduction

The results will be given under the following subsections:

4.2 Sample size

4.3 The prevalence of low back pain

4.4 Demographic factors and their relationship to the presence of low back pain

4.5 Lifestyle factors and their relationship to the presence of low back pain

4.6 Co-morbid factors (diseases) and their relationship to the presence of low back pain

4.2 Sample Size

The total number of participants was 354 which was more than 75% of the total number of hospital employees. The reasons for non-participation in the study included not being available as a result of leave, absence from work and also refusal to participate.

4.3 The Prevalence of Low Back Pain

The point prevalence of low back pain among the participants was 47% (n=168).

4.4 Demographic Factors and their Relationship to the Presence of Low Back Pain

4.4.1 Age distribution of the study population

The age distribution of participants who were suffering from low back pain is shown in Table 4.1.

Table 4.1 Age distribution and low back pain prevalence in participants (N=354)

Age range (years)	**Low Back Pain** **n (%)**	**No Low Back Pain** **n (%)**	**Total** **n (%)**
Younger than 25	25 (7)	37 (11)	62 (18)
26 to 40	107 (30)	109 (31)	216 (61)
41 to 60	33 (9)	36 (10)	69 (19)
Older than 60	3 (1)	4 (1)	7 (2)
Total n (%)	168 (47)	186 (53)	354 (100)

The majority of the study population was between the ages of 26 and 40 years. Thirty percent of the participants suffering from low back pain were in the 26 to 40 year old age group (p=0,64).

Table 4.2 shows the BMI and standard deviation of participants in relation to the different age groups.

Table 4.2 Mean BMI and standard deviation of the participants in relation to age (N=354)

Age range (years)	**Mean BMI** **kg/m²**	**Mean BMI for Low Back Pain kg/m²**	**Mean BMI for No Low Back Pain kg/m²**
Younger than 25	25,05 $\pm$4,9	26,11 $\pm$6,2	24,33 $\pm$3,7
26 to 40	27,99 $\pm$6,5	29,12 $\pm$7,4	26,88 $\pm$5,3
41 to 60	29,83 $\pm$7,6	29,76 $\pm$5,8	29,90 $\pm$9,0
Older than 60	27,29 $\pm$4,9	28,82 $\pm$4,7	26,14 $\pm$5,5

The 41 to 60 year age group had the highest mean BMI.

Table 4.3 below shows the relationship between age and the presence of low back pain by gender.

Table 4.3 The relationship between age and the presence of low back pain by gender (N=354)

Age Category (years)	**OR: Male**	**CI (Confidence Interval)**	**OR: Female**	**CI(Confidence Interval)**
0-25	1,00		1,00	
26-40	0,86	(0,30 ; 2,43)	1,74	(0,86 ; 3,52)
41-60	0,63	(0,18 ; 2,14)	2,06	(0,85 ; 4,98)
Older than 60	1,33	(0,07 ; 26,02)	1,04	(0,15 ; 7,08)
P-value Test for Trend	0,56		0,21	

There was no significant relationship between age and the presence of low back pain by gender.

4.4.2 Gender distribution of the study population

Table 4.4 shows the gender distribution of the study population, as well as the gender distribution of participants with and without low back pain.

Table 4.4 The gender distribution of the study population (N=354)

Gender	**Low Back Pain n (%)**	**No Low Back Pain n (%)**	**Total n (%)**
Male	38 (11)	61 (17)	99 (28)
Female	130 (36)	125 (36)	255 (72)
Total n (%)	168 (47)	186 (53)	354 (100)

More females (72%) than males (28%) employed at Tshwane District Hospital participated in this study and of these more females (36%) than males (11%) had low back pain (p=0,04).

Table 4.5 shows the mean BMI and standard deviation of males and females suffering from low back pain.

Table 4.5 The mean BMI and standard deviations of males and females with and without low back pain (N=354)

Gender	**Low Back Pain (kg/m^2)**	**No Low Back Pain (kg/m^2)**	**Mean BMI (kg/m^2)**	**p-value**
Male	24,97 $\pm$3,9	25,70 $\pm$5,1	25,42 $\pm$4,6	0.69
Female	29,91 $\pm$7,3	27,55 $\pm$6,5	28,75 $\pm$7,0	

The mean BMI of females was higher than the normal BMI. BMI was not associated with low back pain (p=0,69).

4.4.3 Sample distribution of height, weight and BMI measurements

Table 4.6 shows the mean and standard deviation of weight, height and BMI.

Table 4.6 Weight, height and BMI measurements of the participants (N=354)

Measurement	**Minimum**	**Mean and Standard Deviation**	**Maximum**
Weight (kg)	46	74 $\pm$16	142
Height (cm)	120	164 $\pm$10	196
BMI (kg/m^2)	16,30	27,82 $\pm$7	63,19

The mean BMI for all participants was 27,82kg/m^2.

Table 4.7 shows the relationship between BMI and low back pain.

Table 4.7 Low back pain in the different categories of BMI (N=354)

BMI Category (kg/m²)	**Low Back Pain n (%)**	**No Low Back Pain n (%)**	**Total n (%)**
< 19	7 (2)	4 (1)	11 (3)
19 to 27,4	76 (22)	106 (30)	182 (52)
27,5 to 40	74 (21)	68 (20)	142 (40)
> 40	11 (2)	8 (2)	19 (5)
Total n (%)	168 (47)	186 (53)	354 (100)

In the normal weight category (19 to 27,4 kg/m²) 22% of the participants had low back pain and in the mild to moderate obese category (27,5 to 40kg/m²) 21% had low back pain. BMI was not significantly associated with low back pain (p=0,13).

4.4.4 Relationship between demographic factors and the presence of low back pain

Table 4.8 shows the relationship between demographic factors (independently) and the presence of low back pain.

Table 4.8 The relationship between demographic factors (independently) and the presence of low back pain (n=168)

Demographic Factor	Category	Low Back Pain n (%)	Odds Ratio (OR)	(95% Confidence Interval)	p-value Test for trend
Age	< 25	25 (15)	1,00		0,52
	26-40	107 (64)	1,45	(0,82 ; 2,58)	
	41-60	33 (20)	1,36	(0,66 ; 2,73)	
	> 60	3 (2)	1,11	(0,23 ; 5,46)	
Gender	Male	38 (23)	1,00		0,03
	Female	130 (77)	1,67	(1,04 ; 2,69)	
BMI (kg/m²)	19-27,4	76 (45)	1,00		0,04
	< 19	7 (4)	2,44	(0,68 ; 8,71)	
	27,5-39	74 (44)	1,52	(0,97 ; 2,37)	
	≥ 40	11 (7)	1,92	(0,73 ; 5,03)	

The risk for females having low back pain is 1,67 times more than it is for males, as shown by the statistically significant odds ratio (p=0,03).

4.5 Lifestyle Factors and Their Relationship to the Presence of Low Back Pain

4.5.1 Smoking

Of the total sample, 12% (n=41) of participants were smokers. Thirty nine percent of smokers (16) suffered from low back pain on the day of the study. Twelve percent (n=5) of smokers were female and 88% (n=36) were male (p=0,25). Although the number of cigarettes smoked per day as well as the number of years smoked were asked in the questionnaire, subcategories of smoking were not analysed as numbers were too small to give an accurate prediction.

4.5.2 Alcohol consumption

From the total sample of 354, 27% (n=95) of the participants were alcohol consumers. Forty seven percent of alcohol consumers (45) suffered from low back pain on the day of the study (p=1,00). Information on the number of units of alcohol consumed per week was not analysed because the number of alcohol consumers in the sub-categories was too small for statistical analysis.

4.5.3 Participation in physical activities

Table 4.9 shows the distribution of participation in physical activities for those who had low back pain and those who did not have low back pain. In some cases more than one option was marked by the same participant. Other exercise refers to any other form of exercise not specified in the questionnaire.

Table 4.9 Low back pain in participants engaging in different types of physical activity (N=354)

Physical activity	**Low Back Pain n (%)**	**No Low Back Pain n (%)**	**Total n (%)**	**p-value Fisher's Exact**
Walking	133 (38)	147 (42)	280 (79)	1,00
Running	40 (11)	58 (16)	98 (27)	0,12
Group exercise/sport	36 (10)	58 (16)	94 (27)	0,04
Other exercise	31 (9)	31 (9)	62 (18)	0,67
No exercise	40 (11)	33 (9)	73 (21)	0,19

A total number of 73 participants (21%) of the total population did not take part in any form of physical activity. Walking was the most popular form of exercise (79%) done by Tshwane District Hospital employees. About 38% of the walkers experienced low back pain. Ten percent of those who participated in group exercises had low back pain and this was statistically significant (p=0,04). About 11% of the participants who did not exercise at all had low back pain.

Table 4.10 shows the distribution of the frequency of participation in physical activities for those who had low back pain and those who did not have low back pain.

Table 4.10 Distribution of frequency of participation in physical activity (n=281)

Frequency of physical activity	**Low Back Pain n (%)**	**No Low Back Pain n (%)**	**Total n (%)**
1 to 2 times per week	72 (26)	70 (25)	142 (51)
3 to 4 times per week	30 (11)	48 (17)	78 (28)
5 to 7 times per week	19 (7)	21 (7)	40 (14)
More than 7 times per week	7 (2)	14 (5)	21 (7)
Total n (%)	128 (46)	153 (54)	281 (100)

Most of the participants (51%) exercised once or twice a week. Frequency of exercise was not significantly associated with low back pain (p=0,31).

4.5.4 Occupational distribution of the participants

A variety of occupations are present in the staff establishment of Tshwane District Hospital.

4.5.4.1 Type of occupation

Table 4.11 shows the occupational distribution of participants by gender.

Table 4.11 Distribution of occupations in the study population (N=354)

Occupations	**Males n (%)**	**Females n (%)**	**Total n (%)**
Administrative staff	15 (4)	41 (12)	56 (16)
Nursing staff	5 (1)	128 (36)	133 (38)
Allied medical practitioners	0 (0)	11 (3)	11 (3)
Medical practitioners	10 (3)	18 (5)	28 (8)
Drivers	3 (1)	1 (0)	4 (1)
Porters	10 (3)	5 (1)	15 (4)
Security officers	12 (3)	2 (1)	14 (4)
Cleaners	7 (2)	9 (3)	16 (4)
General assistants	16 (5)	36 (10)	52 (15)
Maintenance	21 (6)	4 (1)	25 (7)
Total n (%)	99 (28)	255 (72)	354 (100)

The nursing staff constituted the largest section of the study population (38%).

Fifty percent (n=128) of all females (n=255) in the study population were nursing staff, and 96% (n=128) of nursing staff (n=133) were female. The allied medical practitioners included physiotherapists, occupational therapists, speech therapists and audiologists, dieticians, radiographers and social workers.

Figure 4.1 shows the distribution of low back pain among nursing staff (n=133)

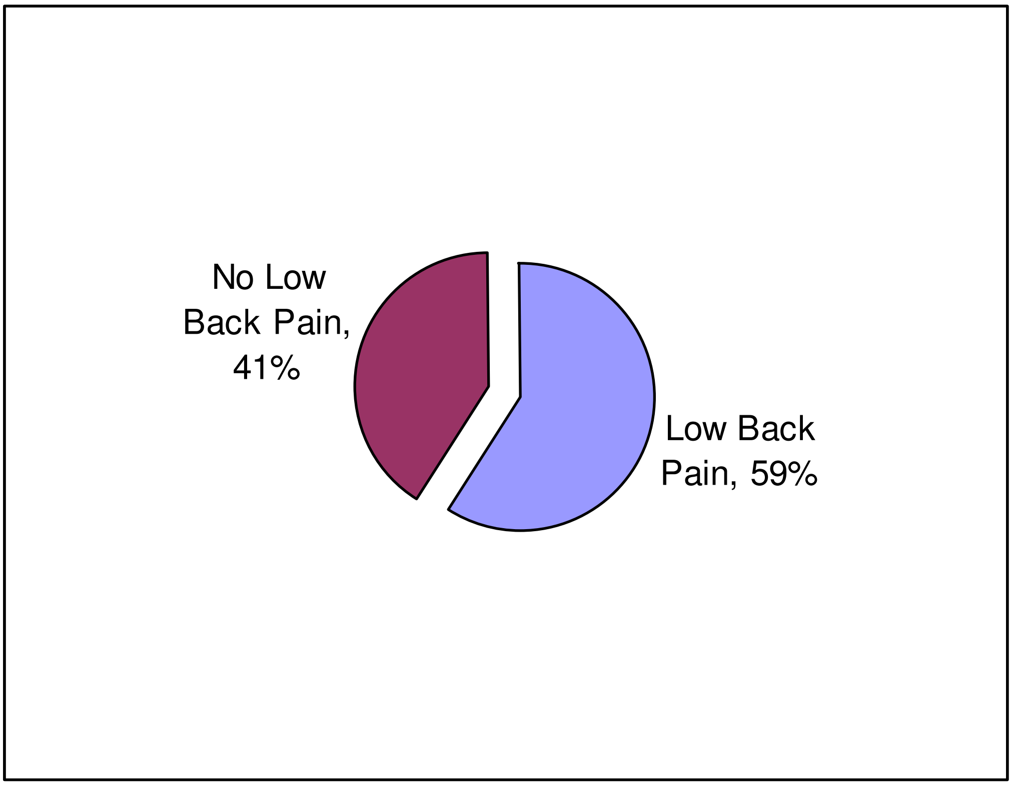

Figure 4.1 Low back pain distribution among nursing staff

Fifty nine percent (n=78) of nursing staff had low back pain.

4.5.4.2 The distribution of daily time spend sitting, standing and walking by participants

Table 4.12 below shows the presence of low back pain related to hours spent sitting, standing and walking.

Table 4.12 Hours spent sitting, standing and walking by participants with and without low back pain (N=354)

Hours	Sitting n (%)		Standing n (%)		Walking n (%)	
	Low Back Pain	No Low Back Pain	Low Back Pain	No Low Back Pain	Low Back Pain	No Low Back Pain
0-1	93 (26)	104(29)	15 (4)	20 (6)	28 (8)	43 (12)
2-4	43 (12)	53 (15)	35 (10)	48 (14)	40 (11)	52 (15)
5-6	17 (5)	16 (5)	43 (12)	44 (12)	42 (12)	40 (11)
> 6	15 (4)	13 (4)	75 (21)	74 (21)	58 (16)	51 (15)
Total n (%)	168 (47)	186 (53)	168 (47)	186 (53)	168 (47)	186 (53)

About 26% of the participants who sat for up to one hour per day had low back pain while 21% of those who stood and 16% of those who walked for more than six hours per day also had low back pain. Sitting, standing and walking were not significantly associated with low back pain (p=0,82, 0,59 and 0,32 respectively).

4.5.4.3 The distribution of heavy physical duty (lifting) by the participants

Low back pain in participants who lifted objects or people during a working day is shown in Table 4.13.

Table 4.13 The distribution of lifting of objects for those with low back pain and those without low back pain (N=354)

Often lifting objects or people	Low Back Pain n (%)	No Low Back Pain n (%)	Total n (%)
No	20 (6)	36 (10)	56 (16)
Yes	148 (42)	150 (42)	298 (84)
Total n (%)	168 (47)	186 (53)	354 (100)

The majority of participants (84%) lifted objects or people in the performance of their occupational activities.

Ninety percent (n=120) of nursing staff reported frequent lifting of objects or patients at work.

4.5.5 Distribution of perceived stress by participants

The distribution of perceived stress at work and low back pain is shown in Table 4.14.

Table 4.14 The distribution of perceived stress at work and low back pain (N=354)

Perceived work stress	Low Back Pain n (%)	No Low Back Pain n (%)	Total n (%)
Never	15 (4)	28 (8)	43 (12)
Sometimes	89 (25)	113 (32)	202 (57)
Often	24 (7)	24 (7)	48 (14)
All the time	40 (11)	21 (6)	61 (17)
Total n (%)	168 (47)	186 (53)	354 (100)

Few participants (12%) never experienced stress while 66% of the 61 participants who experienced stress all the time had low back pain. Perceived stress at work was found to be significantly associated with the presence of low back pain (p=0,01).

4.5.6 The relationship between lifestyle factors and the presence of low back pain

Table 4.15 below shows the distribution of the lifestyle factors (independently) and their relationship to low back pain.

Table 4.15 The relationship between lifestyle factors (independently) and the presence of low back pain (n=168)

Lifestyle Factor	Category	Low Back Pain n (%)	Odds Ratio (OR)	(95% Confidence Interval)	p-value Test for Trend
Smoking	No	152 (90)	1,00	(0,35 ; 1,31)	0,24
	Yes	16 (10)	0,67		
Alcohol consumption	No	123 (73)	1,00	(0,62 ; 1,59)	0,98
	Yes	45 (27)	1,00		
Participation in physical activities: Walking	Yes	133 (79)	1,00	(0,59 ; 1,66)	0,98
	No	35 (21)	0,99		
Running	Yes	40 (24)	1,00	(0,90 ; 2,33)	0,12
	No	128 (76)	1,45		
Group exercise	Yes	36 (21)	1,00	(1,02 ; 2,70)	0,04
	No	132 (79)	1,66		

Other exercise	Yes	31 (18)	1,00	(0,51 ; 1,53)	0,66
	No	137 (82)	0,88		
No exercise	Yes	40 (34)	1,00	(0,41 ; 1,16)	0,16
	No	128 (76)	0,69		
Daily time spend sitting at work (hours)	0-1	93 (55)	1,00		0,55
	2-4	43 (26)	0,90	(0,55 ; 1,48)	
	5-6	17 (10)	1,19	(0,57 ; 2,49)	
	>6	15 (9)	1,29	(0,58 ; 2,86)	
Daily time spend standing at work (hours)	0-1	15 (9)	1,00		0,26
	2-4	35 (21)	0,97	(0,44 ; 2,17)	
	5-6	43 (26)	1,30	(0,59 ; 2,89)	
	>6	75 (44)	1,39	(0,66 ; 2,94)	
Daily time spend walking at work (hours)	0-1	28 (17)	1,00		0,04
	2-4	40 (24)	1,18	(0,63 ; 2,22)	
	5-6	42 (25)	1,61	(0,84 ; 3,09)	
	>6	58 (34)	1,72	(0,93 ; 3,19)	
Heavy physical duty (lifting)	No	20 (12)	1,00		0,06
	Yes	148 (88)	1,78	(0,98 ; 3,22)	
Perceived stress at work	Never	15 (9)	1,00		0,001
	Some-times	89 (53)	1,47	(0,74 ; 2,93)	
	Often	24 (14)	1,87	(0,79 ; 4,41)	
	All the time	39 (24)	3,47	(1,46 ; 8,23)	

The risk of developing low back pain was 3.47 times more with the increase in amount of perceived stress. Those who did not participate in group exercise were 1.66 more times likely to develop low back pain.

Table 4.16 below shows the distribution of the frequency of exercise (independently) and their relationship to low back pain.

Table 4.16 The relationship between frequency of exercise (independently) and the presence of low back pain (n=128)

Lifestyle Factor	Category	Low Back Pain n (%)	Odds Ratio (OR)	(95% Confidence Interval)	p-value Test for Trend
Frequency of exercise (per week)	< 2	72 (56)	1,00		0,11
	3-4	30 (24)	0,67	(0,40 ; 1,15)	
	5-7	19 (15)	0,81	(0,42 ; 1,59)	
	> 7	7 (5)	0,49	(0,19 ; 1,28)	

The relationship between frequency of exercise and low back pain was not statistically significant.

4.6 The Distribution of co-morbid factors (diseases) and their relationship to low back pain

Ninety five participants (27%) of the study population were suffering from co-morbidities. Co-morbidities that were present in the study population are shown in Table 4.17. In some cases more than one option was marked by the same participant.

Table 4.17 The distribution of co-morbidities in the study population (n=95)

Co-morbid Factor	**Low Back Pain n (%)**	**No Low Back Pain n (%)**	**Total n (%)**	**p-value Fisher's Exact**
Diabetes	1 (1)	6 (6)	7 (7)	0,13
Hypertension	12 (12)	10 (11)	22 (23)	0,52
Arthritis	11 (12)	6 (6)	17 (18)	0,21
Other	31 (33)	18 (19)	49 (52)	0,02

Most of the participants had co-morbidities in the category "other". In this category, twenty five participants specified that they were suffering from general body pain and 8 suffered from allergies. The other illnesses specified were peptic ulceration, asthma, HIV, epilepsy, kidney stones, flu and anxiety.

Table 4.18 below shows the relationship between co-morbid factors (independently) and the presence of low back pain.

Table 4.18 The relationship between co-morbid factors (independently) and the presence of low back pain (n=168)

Co-morbid disease	**Category**	**Low Back Pain n (%) n=168**	**Odds Ratio (OR)**	**(95% Confidence Interval)**	**p-value Test for Trend**
Diabetes	No	167 (99)	1,00	(0,02 ; 1,53)	0,08
	Yes	1 (1)	1,18		
Hypertension	No	156 (93)	1,00	(0,57 ; 3,22)	0,49
	Yes	12 (7)	1,35		
Arthritis	No	157 (93)	1,00	(0,76 ; 5,84)	0,15
	Yes	11 (7)	2,10		
Other	No	137 (82)	1,00	(1,13 ; 3,96)	0,02
	Yes	31 (18)	2,11		

The risk of developing low back pain increased 2,11 fold when suffering from other co-morbid diseases.

CHAPTER 5

5.0 DISCUSSION

5.1 Introduction

This chapter will focus on the discussion of the research findings. The results will be discussed under the following subheadings:

5.2 Prevalence of low back pain

5.3 Demographic factors and their relationship to the presence of low back pain

5.4 Lifestyle factors and their relationship to the presence of low back pain

5.5 Co-morbid factors (diseases) and their relationship to the presence of low back pain

5.6 Limitations of the study

5.2 Prevalence of Low Back Pain

The point prevalence of low back pain among the participants in this study was 47%. This is higher than low back pain point prevalence rates of 35,8% found by Van Vuuren et al. (2005) in a South African study. Van Vuuren et al.'s (2005) population consisted of 366 employees from a steel plant industry. The population in Van Vuuren et al.'s (2005) study was part of the semi-automated industry. It is possible that this semi-automated industry demands less heavy physical occupational tasks from its workers when compared to occupational tasks in a hospital setting. This may have resulted in lower point prevalence rates compared to studies done in other industries. High low back pain point prevalence rates may have a huge negative impact on human resource and associated productivity at work (Van Vuuren et al., 2005). This issue is also germane when looking at the essential human resource required in a hospital setting. The associated decrease in productivity as a result of a high prevalence of low back pain may have detrimental consequences on direct and in-direct patient care in a district hospital.

5.3 Demographic Factors and their Relationship to the Presence of Low Back Pain

5.3.1 Age

One hundred and seven of the 216 participants between the ages of 26 and 40 years (50% of this age group) suffered from low back pain. Although the association between this age group and the presence of low back pain was found to be statistically insignificant (p=0,64), this is higher than the point prevalence of low back pain found in this study. According to Jeffries et al. (2007), the prevalence of low back pain increases with age and Hellerstein et al. (1996) adds that economic productivity decreases with age. This can therefore be used to explain the possible scenario where the age groups that are expected to contribute maximally to the economy may not be able to do so as a result of low back pain problems at an early age, thereby negatively influencing their productive capacity. It has been shown that sick leave taken as a result of low back pain increases with age (Steenstra et al., 2005) and hence if it is prevalent in the younger population where high levels of productivity are expected, this may negatively influence economic output.

Age was found not to be significantly associated with low back pain, however 64% of those who had low back pain belonged to the 26 – 40 year age group. This is much higher when compared to the Australian point prevalence rates for this age group (Australian Bureau of Statistics, 2001). The reason for this may be the difference in the working environments and possibly the use of better technology in Australia given the fact that Australia is a developed country. The reason for the high prevalence of low back pain in this age group could be attributed to the fact that the 26 to 40 year age range is seen as the most productive years of life (Galukande et al., 2006; Anderson et al., 2002) and hence this population is involved in work that puts them at risk of developing low back pain. Lowering the exposure might not be possible, but work and ergonomic adaptation as a preventative rather than a management strategy becomes an important factor when looking at this age group.

According to Kostova and Koleva (2001), there is a gradual increase in low back pain after the age of 40 years. This however does not conform to this study's finding which showed that only 33 (48%) of the 69 participants in the 41 to 60 year old age group suffered from low back pain, a figure lower than that which was found for the 26 to 40 year age group. The difference in these findings may be because Kostova and Koleva (2001) had a much larger sample group (998 participants) which was divided into only two age groups, those below 40 and those above 40 years. According to Kostova and Koleva (2001), the "classical" occupational risk factors – manual handling, pulling, pushing, etc. were not part of the physical activities required for the jobs of their study population. The lower number of participants with low back pain in those above 40 years could be because older employees would have worked themselves up to more senior positions and more flexible occupational activities with very little if any heavy physical workload.

The mean BMI increased with age in low back pain sufferers and reached a peak in the 41 to 60 years age group. According to Crook et al. (2001) the appropriate BMI for people over the age of 35 is between 21 and 27kg/m^2. In this study the mean BMI for the 41 to 60 year age group was just below 30kg/m^2. This means that the majority of participants in this age group could be considered to have mild to moderate obesity. BMI was however not found to have an influence on the presence of low back pain in this study for all categories. It was interesting to note that the mean BMI of participants with low back pain in the 41 to 60 year age group very closely compared with that of participants in the same age group of those without low back pain. Even though the literature shows conflicting results on the influence of BMI on the presence of low back pain, being overweight is detrimental to one's health and general wellbeing.

5.3.2 Gender

More women than men suffered from low back pain in this study and females were 1,67 times more at risk for developing low back pain than men (CI 1.04 ; 2.69) a finding supported by the results of Burdorf and Sorock's (1997) study. Possible explanations for the higher prevalence of low back pain among women are the influence of gyneacological conditions (Kwon et al., 2006), domestic activities (Alcouffe et al., 1999) and the higher reporting of symptoms by women (Barsky et al., 2001). Occupational adaptation by female employees becomes even more important when considering the facts that female low back pain sufferers usually suffer more severe low back pain (Alcouffe et al., 1999) and that they return to work slower after sick leave has been taken for an acute episode of low back pain (Mogren, 2006). It should be noted that a fairly large number of this study population comprised of nurses (38%) and hence the importance of proper kinetic handling cannot be overemphasised. The vast majority of nursing staff were female (96%) and low back pain in this occupational group was also much higher than the general point prevalence of low back pain found in this study. Nursing staff are commonly seen as vulnerable to low back pain given then the nature of their work (Violante et al., 2004).

The BMI of females were on average 4,3kg/m² higher than the BMI of males in this study and this was found to be statistically significant (p=0,04). Deyo and Bass (1989) found that there was a greater prevalence of low back pain with an increase in BMI. As the relationship between gender and BMI was not established in this study, the high prevalence of low back pain in women which was found in this study could not be attributed to the high BMI in females.

5.3.3 Body Mass Index (BMI) measurements

According to Crook et al. (2001) the appropriate weight is up to a BMI of 25 kg/m² for those below 34 and up to 27 kg/m² for those above 34 years of age. Even though 40% of the participants in this study were in the mild to moderate obesity category, the association between low back pain and BMI was found not to be statistically insignificant (p=0,13). The same results were also found by other authors (Alcouffe et al., 1999; Mirtz and Greene, 2005; Foppa and Noack, 1996; Andrusaitis et al., 2006). Despite the fact that the margin for being in the overweight to obese category in Kwon et al.'s (2006) study was much lower than what was used in this study, they did not find an association between low back pain and BMI either. It is postulated that low back pain may not be influenced by BMI directly, but indirectly. Mechanical and metabolical abnormalities secondary to lifestyle choices may be contributing to the presence of low back pain (Janke et al., 2007). Lifestyle choices including smoking, alcohol consumption, recreational and occupational activities may be influencing BMI and at the same time low back pain. Janke et al., (2007) suggested that quality of life is negatively affected by the co-occurrence of pain and being overweight, which emphasises the importance of lifestyle education not only in the hospital setting, but also among the general public.

5.4 Lifestyle Factors and their Relationship to the Presence of Low Back Pain

5.4.1 Smoking

It was found in this study that 39% of those who smoked suffered from low back pain. The relationship between smoking and the presence of low back pain was found to be statistically insignificant (p=0,25). Kwon et al. (2006) also found no significant correlation between smoking and low back pain. The total number of smokers in this study (41) was relatively low, and larger sample studies may be necessary to be able to conclude on the influence of smoking on low back pain.

5.4.2 Alcohol consumption

From a total of 95 participants of the study population who were alcohol consumers, 47% (45) of them had low back pain. This was however statistically insignificant (p=1,00). Andrusaitis et al. (2006) found that 45,9% of the individuals with low back pain consumed alcohol on a regular basis. However in this study, the risk of developing low back pain did not increase with regular consumption of alcohol (OR 1,00: CI 0,62 ; 1,59). These findings agree with those found in the literature and do not show alcohol consumption to be a risk factor for low back pain.

5.4.3 Physical activity

Despite a fairly large number of the participants being involved in some form of sport, 48% of the participants who exercised by walking and 41% of those who ran had low back pain. Both these results were however found to be statistically insignificant (p=1,00 and p=0,12 respectively). The relatively high prevalence of low back among these exercising groups could be attributed to either the low number of exercise per week (with 51% of the total sample exercising one to two times per week) or maybe an incorrect way of exercising which was beyond the scope of this study. It was however interesting to note that of those who did group exercises, only 38% had low back pain and this was the lowest number of participants who had low back pain for all the exercise categories. Participation in group exercises was found to reduce the chances of developing low back pain with p = 0.04 (OR 1.66: CI 1.02 ; 2.70). The reason for this low percentage of low back pain sufferers among those who did group exercises may be that group exercises are more motivating and encourage participation, which in turn may ensure better compliance with exercise in low back pain prevention programmes.

Slightly above half (55%) of those participants who did not exercise at all had low back pain. This percentage is higher than any one of the exercise groups although this was statistically insignificant (p=0.19). Kwon et al. (2006)'s study showed that the number of employees with low back pain decreased as the number of exercise sessions per week increased. This study failed to show any particular trend as regards the influence of the number of times participants exercised on the low back pain. The diversity of the study sample in terms of the occupations each did could have contributed to the masking of any particular trends. These findings are unlike Kwon et al.'s (2006) which showed that exercising three to four times per week was beneficial for low back pain.

5.4.4 Occupation

There exists a huge overlap between daily tasks and risk indicators present in different occupations (Nahit et al., 2001). In order to link occupation with low back pain, an in-depth assessment of circumstances surrounding each occupation would have to be done. This was beyond the scope of this study.

5.4.4.1 Type of Occupation

A high percentage of nursing staff (59%) experienced low back pain. Heavy physical duty is part of the nursing staff's occupational activities (Sun et al., 2007) and 90% of nursing staff reported that they frequently lifted objects or people during a working day. This can be used to explain why in this study a fairly large number of the nurses (58%) had low back pain. This finding is in line with that of Smith et al. (2005) who established that manual handling of patients is the main cause of low back pain among nursing staff. Another explanation may be the possible ignorance with regards to kinetic handling and ergonomics during these nursing activities which includes lifting, stooping over patients and transferring patients (Engels et al., 1996; Sun et al., 2007).

5.4.4.2 Daily time spent sitting, standing and walking by participants

In all the three activities investigated, low back pain was higher when the daily time spent sitting, standing or walking was more than six hours even though the results were not statistically significant. Pain is caused by increased load on the ligaments during sustained positions. Weakness of the stabilising muscles increases the load which subsequently increases the pain experienced (Panjabi, 1992). As sitting, standing and walking for more than six hours per day had the highest percentages of low back pain, this may be an indication that a balance should exist between prolonged sitting, standing and walking. Winkel (1986) said that moderate loads applied to the spine during sitting, standing and walking seem to be protective while either too much or too little might cause pain. It should be taken into account that the self-reporting of time spend sitting, standing and walking may not be accurate, as participants may not be able to recall information accurately.

5.4.4.3 Heavy physical duty: lifting

The majority (84%) of the study population reported that they often lift objects or people during a working day while 88% (n=148) of the participants with low back pain frequently lifted objects or people. Although lifting was not found to be a significant risk factor for the development of low back pain (OR 1,78 CI 0,98 ; 3,19) it should be noted that lifting and heavy physical duty, including bending and twisting, is part of the occupational activities of hospital employees and thus plays a huge role in the development of low back pain. Not incorporating the correct kinetic handling skills or working in a bad ergonomic environment can aggravate the problem. However, occupational duties of hospital employees differ in different departments and a more specific assessment needs to be done in order to establish the nature of lifting in their workplace. Direct observation of working positions is a better way of assessing postural load on the lower back than a self-administered questionnaire (Viikari-Juintura et al., 1996).

5.4.5 Perceived stress

The study established that 40 (66%) of the 61 participants who experienced stress all the time, had low back pain. The risk to develop low back pain for this group was also elevated (OR 3,47: CI 1,46 ; 8,23) and a positive association which was statistically significant (p=0,01) was found between stress at work and the presence of low back pain in this study.

A similar significant effect of work stress on low back pain was also found by Hartvigsen et al. (2004). The lack of control over time as well as lack of control over stressful events is a major cause of stress experience (Elfering et al., 2002).

Stress causes raised blood cortisol levels which has an influence on muscle function and in this way leaves the body vulnerable to injury. Stress management strategies may be lacking and the good thing is that they may be taught. Stressful situations may also happen outside the workplace and may influence the stress experienced at work and in general. What could not be derived from this study is whether it was stress that was experienced at work which increased low back pain, or if increased stress was experienced as a result of low back pain.

5.5 Co-morbid factors (diseases) and their relationship to the presence of low back pain

A total of 95 (27%) participants suffered from co-morbidities and a statistically insignificant association was found between diabetes, hypertension, arthritis and low back pain (p=0,13, p=0,52 and p=0,21 respectively). Only one participant suffering from diabetes and 12 suffering from hypertension had low back pain as well. Diabetes is a lifestyle disease which develops over time. There is an increase in prevalence of diabetes and hypertension by age (Sayeed et al., 1997; Haghdoost et al., 2008). In this study the majority of the study population (79%) were in the age groups below forty years and this explains the low number of participants suffering from diabetes and hypertension. The number of participants suffering from arthritis as well as low back pain was low (11 participants) and the type of arthritis were not specified in this study. For the above reasons a reasonable conclusion on the association between diabetes, hypertension, arthritis and low back pain cannot be drawn.

A significant association between low back pain and “other” co-morbidities was found (p=0,02) and the risk to develop low back pain also increased with the presence of “other” co-morbidities (OR 2.11: CI 1.13; 3.96). Although significant results were found for the “other” section of the co-morbid diseases it should be noted that this “other” section comprised of a wide variety of diseases and conditions which included peptic ulceration, asthma, HIV, epilepsy, kidney stones, flu and anxiety as mentioned by the participants. As a result of this wide variety of diseases and conditions, the strength of the connection between low back pain and "other" co-morbidities was weakened. It therefore became impossible to single out from this list the ones that were associated with low back pain. Diabetes, hypertension and arthritis were not found to be associated with low back pain. This goes against the findings by Stewart et al. (1989) who established that low back pain was associated with other co-morbid diseases but their study population consisted of a much higher number of participants (9385) with nine common chronic medical conditions specified. Although the number of participants with "other" co-morbid diseases was low, co-morbidities can have an impact on the presence of low back pain as a general unhealthy lifestyle may lead to co-morbidities and consequently to low back pain.

5.6 Limitations of the Study

Information gained from this study is limited to the employees of Tshwane District Hospital and cannot be generalised to the entire population of hospital employees. In order to draw more accurate conclusions regarding working positions, postural load should rather be assessed by direct observation. This should also be done for average time spent standing, sitting and lifting. Enquiries on household chores and leisure activities were not included in the questionnaires and may have an influence on the presence of low back pain. This study does not distinguish between recreational and occupational low back pain, nor does it distinguish between accidental and overuse injuries. Health and low back pain could have been underreported by staff in the fear of repercussions from the employer.

CHAPTER 6

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The aim of this study was to determine the factors that are associated with the presence of low back pain among the staff members employed at Tshwane District Hospital in Gauteng, South Africa.

- The point prevalence of low back pain among Tshwane District Hospital employees is 47%.

- Most of the employees are female nurses aged between 26 and 40 years with BMI values higher than normal. The majority of the employees participate in exercises although this is mainly for 1 to 2 times a week.

- Among the demographic factors, only female gender is associated with the presence of low back pain.

- Among the lifestyle factors, participation in group exercises is a protective factor against low back pain while perceived stress all the time is associated with the presence of low back pain.

- None of the isolated co-morbid diseases are associated with the presence of low back pain. The “other” category for co-morbid disease shows significant results although nothing meaningful can be derived from them because this represents a group of diseases.

6.2 Recommendations

6.2.1 Clinical recommendations

Clinical recommendations for Tshwane District Hospital arising from this study are that:

- Special adaptation of the occupational and recreational environment at the hospital should be considered for females in order to curtail the development of back problems as females are at a greater risk of developing low back pain.
- Group exercises should be encouraged in the prevention and long term management of low back pain.
- Healthcare providers need to include the provision of education, support and appropriate referral for patients who perceive themselves to have high levels of stress. Stress management strategies and relaxation techniques should be included into low back pain prevention and management programmes.

6.2.2 Recommendations for further research

Recommendations for future studies are:

- There is a need to study the influence of walking, running and group exercise on low back pain separately to see how each individual factor interacts with low back pain.
- There is a need to include household activities and other recreational activities when studying the influence of physical load on the lower back.

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8.0 APPENDICES

APPENDIX A

Information sheet

Good day

My name is Benita Naude. I am a physiotherapist at Tshwane District Hospital. As part of a masters programme that I am following at the University of the Witwatersrand, I am doing research on the influence of lifestyle, demographic and co-morbid factors on low back pain in Tshwane District Hospital staff. I will be most grateful if you are willing to participate in this research.

<u>Why is this study important?</u>

A large number of hospital staff members seek treatment for low back pain. Low back pain is influencing productivity at work as well as quality of life. The role that lifestyle, demographic and co-morbid factors play in low back pain has not yet been established in staff employed in a South African hospital setting.

<u>What would you be expected to do?</u>

I developed a questionnaire based on the relevant factors which may play a role in the prevalence of low back pain. There are also some questions on demographic information. All permanent staff members working at Tshwane District Hospital will be given the opportunity to participate. Participation is completely voluntary and you may withdraw at any time. You will not suffer any consequences, and you do not have to provide a reason should you decide not to participate.

You will be weighed and your length will be measured before completing the questionnaire. This is necessary in order to determine your body mass index. Completing the questionnaire will take approximately ten minutes of your time. If you do not understand any of the questions, you may ask me at any time. You are not allowed to discuss the questions with your colleagues, though. I will take the questionnaire form you immediately afterwards.

<u>What are the benefits to the participants?</u>

Information collected from the participants will be analysed. We hope to establish a relationship between certain demographic, lifestyle and co-morbid factors and low back pain. Feedback on the findings will be shared with the participants in the form of a circular.

<u>Will information be handled as confidential?</u>

Names of participants will only be written on the consent form and not on the questionnaire. Consent forms will be kept separately from the questionnaires. All information will be confidential and will only be used as part of this study.

For more information, or if you have any queries, please phone me at
072 863 7864.

If you are willing to participate in this study by filling in a questionnaire, please fill in and sign the consent form attached.

Yours truly

BENITA NAUDE

APPENDIX B

Information sheet

Dumelang

Leina la ka ke Benita Naude. Ke ngaka ya marapo ko sepetlele sa Tshwane District. Ke tsweletsa dithuto tsa university ya Witwatersrand, ke etsa dipatisiso tse tla thusang mo bolwetsing ba mokwatla mo badiring ba sepetlele sa Tshwane District. Nka itumela thata ga le ka ba le kgatlhego kgotsa go tsaya karolo.

Goreng thuto e ele botlhokwa

Badiri ba ba ntsi ba sepetlele ba tlhoka thuso ka bolwetse ba botlhoko ba mokwatla. Botlhoko ba mokwatla bo ama tswelopele ya badiri mo ditirong tsa bona le matshelo a bona.

A re tla solofela eng? Mo go wena

Ke etsitse dipotso tse di amang matshelo a rona le go tseya karolo mo botlhoko ba mokwatla. Badiri ba sepetlele batla fiwa monyetla wa go tsaya karolo. Go tsaya karolo ka ga mongwe le mongwe o a batlang, kgatsa o ka tlhogela nako ngwe le ngwe. Ga go na ditlamorago e bile ga o tlhoke go neela lebaka la go tlogela.

O tlhile go kadiwa pele o tlatsa pampiri ya dipotso. Go botlhokwa go re ba itse sekala sa gago. Go tlatsa pampire ya dipotso go tla tsaya metsotso e le lesome ga o sa tlhalogenye dipotso o ka botsa nako ngwe le ngwe. Ga wa letlelewa ga boa ka dipotso tseo le madirikawena, ke tla tshwenela ke go tseya pampiri ya dipotso ka yo ne nako eo.

Ditlamorago kgotsa dituelo tsa motseyakarolo karolo

Dintlha tsa motseyakarolo di ka sekasekiwa. Re solofela go e tsa phapang mo matshelong le matlhoko a mokwetla. Morago ba tsayakarolo ba tla itsisiwe ka makwalo gore ba dirile jwang.

A dintlha tsa rona di tla ba sephiri

Maina a batsoyakarolo a tla kwalwa mo pampering ya tumelano e seng ya dipotso. Pampiri ya tumelano e tlha beiwa e le nngwe e seng le ya dipitso. Dintlha tsotlhe di tla ba sephiri di tla dirisiwa fela jaaka e le tsa dithuto fela.

Go itse go feta fa, kgotsa ga o na le dipotso o ka nteletsa mo nomorong e e lateleng 072 863 7806.

Ga o batla go tsaya karolo o tshwanela ke o tlhatsa pampirir ya dipotso, ka kopo tlatsa morago o tlatse le pampiri ya kgolagano e e lateleng.

Ka lerato

BENITA NAUDE

APPENDIX C

Consent form

I ___________________________________ hereby agree to participate in the study as described to me in the information sheet. By signing this form I am agreeing to filling in the questionnaire seeking information on factors that may be linked to the presence of low back pain.

I understand that there are no monetary rewards for my participation and that I am not obliged to take part and can withdraw from the study at any given time.

Signature _________________________

Witness __________________________

Date ___________________________

APPENDIX D

Consent form

Nna ________________________ ke ikana ka go tseya karolo mo dithutong tse di builweng fa godimo. Ke a dumela kgotsa go ikgolagena le pampiro ya go neelana ka ditaba tsa botshelo ba me tse di tla tsamaisana le botlhoko ba mokwetla.

Ke a tlhaloganya gore ga go na tuelo kgotsa madi a ke tla fiweng morago ga dithuto. Le gore ke dumeletswe go ka tlogela nako ngwe le ngwe.

Tshaeno_________________

Paki ____________________

Letsatsi _________________

APPENDIX E

Questionnaire

1. Measurements

Weight _____________kg
Height _____________cm BMI ___________________

For all the questions below, please tick in the box with the appropriate response for you.

2. Patient information

2.1 What is your age?

- ☐ 1. 0 – 25
- ☐ 2. 26 – 40
- ☐ 3. 41 – 60
- ☐ 4. 60 or older

2.2 What is your gender?

- ☐ 1. Male
- ☐ 2. Female

2.3 To which ethnic group do you belong?

- ☐ 1. African
- ☐ 2. White
- ☐ 3. Indian
- ☐ 4. Coloured
- ☐ 5. Other (specify) ______________________

3. Recreation

3.1 Which of the following forms of exercise do you do?

Walking more than 15minutes at a time

- ☐ 1. Yes
- ☐ 2. No

Running more than 15minutes at a time

- ☐ 1. Yes
- ☐ 2. No

Group exercise/sport more than 15minutes at a time

- ☐ 1. Yes
- ☐ 2. No

No exercise

- ☐ 1. Yes
- ☐ 2. No

Other

- ☐ 1. Yes
- ☐ 2. No

Specify ____

3.2 How often do you do exercise?

- ☐ 1. 0 – 2 times per week
- ☐ 2. 3 – 4 times per week
- ☐ 3. 5 – 7 times per week
- ☐ 4. More than 7 times per week

4. Occupation

4.1 What is your occupation?

- ☐ 1. Administrative staff
- ☐ 2. Nursing

- ☐ 3. Allied medical practitioner
- ☐ 4. Medical practitioner
- ☐ 5. Driver
- ☐ 6. Porter
- ☐ 7. Other (specify) ____________________

4.2 If you are an allied medical practitioner, in which occupation? <u>(if not, skip this question)</u>

- ☐ 1. Physiotherapy
- ☐ 2. Occupational Therapy
- ☐ 3. Speech therapist and audiologist
- ☐ 4. Radiographer
- ☐ 5. Dietician
- ☐ 6. Other (specify) _______________________

4.3 In which department or ward are you <u>mostly</u> working? (tick one)

- ☐ 1. Administration
- ☐ 2. Ward 1 - children
- ☐ 3. Ward 2/4 – ante/post-natal
- ☐ 4. Ward 5/6 – adult wards
- ☐ 5. Casualty
- ☐ 6. OPD
- ☐ 7. Other (specify) ______________________

4.4 During an 8 hour working day, how many hours do you spend sitting?

- ☐ 1. 0-1 hours
- ☐ 2. 2-4 hours
- ☐ 3. 5-6 hours
- ☐ 4. More than 6 hours

4.5 During an 8 hour working day, how many hours do you spend standing?

- ☐ 1. 0-1 hours
- ☐ 2. 2-4 hours
- ☐ 3. 5-6 hours
- ☐ 4. More than 6 hours

4.6 During an 8 hour working day, how many hours do you spend walking?

- ☐ 1. 0-1 hours
- ☐ 2. 2-4 hours
- ☐ 3. 5-6 hours
- ☐ 4. More than 6 hours

4.7 Do you often lift objects/people during your working day?

- ☐ 1. Yes
- ☐ 2. No

4.8 If yes, what?

Files/books

- ☐ 1. Yes
- ☐ 2. No

Furniture

- ☐ 1. Yes
- ☐ 2. No

Patients

- ☐ 1. Yes
- ☐ 2. No

Other

- ☐ 1. Yes
- ☐ 2. No

Specify ____

4.9 In your personal opinion, do you experience stress at work?

- ☐ 1. Never
- ☐ 2. Sometimes
- ☐ 3. Often
- ☐ 4. All the time
- ☐ 5. Too much to handle

5. General health

5.1 Do you suffer from any of the following diseases?

Diabetes (sugar problems)

- ☐ 1. Yes
- ☐ 2. No

Hypertension (high blood pressure)

- ☐ 1. Yes
- ☐ 2. No

Arthritis

- ☐ 1. Yes
- ☐ 2. No

Other

- ☐ 1. Yes
- ☐ 2. No

Specify ____

5.2 During the last 12 months, how much sick leave have you taken, if any?

- ☐ 1. 0 days
- ☐ 2. 1 – 6 days
- ☐ 3. 7 -12 days
- ☐ 4. more than 12 days

5.3 If sick leave was taken, has any of it been for low back pain?

- ☐ 1. Yes
- ☐ 2. No

5.4 Do you smoke?

- ☐ 1. Yes
- ☐ 2. No

5.5 If yes, how many cigarettes per day?

- ☐ 1. 1-4
- ☐ 2. 5-10
- ☐ 3. 11-15
- ☐ 4. More than 15

5.6 If yes, for how long?

- ☐ 1. Less than 1 year
- ☐ 2. 1 – 5 years
- ☐ 3. 6 – 10 years
- ☐ 4. More than 10 years

5.7 Do you consume alcohol?

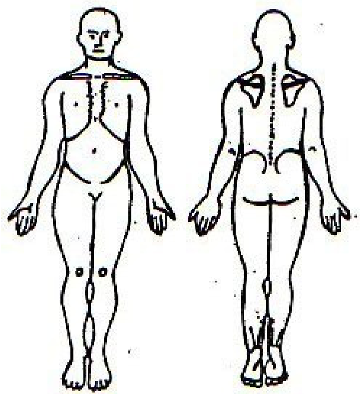
- ☐ 1. Yes
- ☐ 2. No

5.8 If yes, how many units per week? (one unit is one glass of wine or beer or 25ml of spirits)

- ☐ 1. 1-2
- ☐ 2. 3-5
- ☐ 3. 5-10
- ☐ 4. more than 10

5.9 At this moment, do you have low back pain? (Pain in the area shaded on the picture)

- ☐ 1. Yes
- ☐ 2. No



5.10 If yes, how did you manage your low back pain?

Consulted a medical doctor

- ☐ 1. Yes
- ☐ 2. No

Pain medication

- ☐ 1. Yes
- ☐ 2. No

Physiotherapy

- ☐ 1. Yes
- ☐ 2. No

No treatment

- ☐ 1. Yes
- ☐ 2. No

Other

- ☐ 1. Yes
- ☐ 2. No

Specify ________________________________

5.11 Have you experienced low back pain in the past?

☐ 1. Yes

☐ 2. No

5.12 If you have experienced low back pain in the past please indicate the number of years of months that it has affected you:

________years and/or __________months

5.13 How did you manage your low back pain?

Consulted a medical doctor

☐ 1. Yes

☐ 2. No

Physiotherapy

☐ 1. Yes

☐ 2. No

Pain medication

☐ 1. Yes

☐ 2. No

Surgery

☐ 1. Yes

☐ 2. No

No treatment

☐ 1. Yes

☐ 2. No

Other

☐ 1. Yes

☐ 2. No

Specify ___________________________________

APPENDIX F

Questionnaire

1. Measurements

Bokima _____________kg
Botelle _____________cm BMI ____________________

Go dipotsiso tse dileng ka tlase, ke kopa o swaye ka mo gare lekisi ka dikelebo tse di lebaganeng.

2. Participant Information

2.1 O na le mengwaga e mekae?

- ☐ 1. 0 – 25
- ☐ 2. 26 – 40
- ☐ 3. 41 – 60
- ☐ 4. 60 goba gofitisa

2.2 Bonge bja gago ke eng?

- ☐ 1. Monna
- ☐ 2. Mosadi

2.3 O mohlobo mang?

- ☐ 1. Motho moso
- ☐ 2. Lekgowa
- ☐ 3. Lekola
- ☐ 4. Mokhalate
- ☐ 5. Mongwe (Thlalosa) ______________________

(Bula)

3. Recreation

3.1 Ke boitapolosa bo feng bo o bo dirisang?

Go sepela gofitisa metsotso e 15

- ☐ 1. Ee
- ☐ 2. Nnyaa

Go kitima gofitisa metsotso e 15

- ☐ 1. Ee
- ☐ 2. Nnyaa

Go tshameka ka sehlopa

- ☐ 1. Ee
- ☐ 2. Nnyaa

Ga ke itapolose

- ☐ 1. Ee
- ☐ 2. Nnyaa

Tse dingwe

- ☐ 1. Ee
- ☐ 2. Nnyaa

Thalosa ____

3.2 O itapolosa ga kae?

- ☐ 1. 0 – 2 mo bekeng
- ☐ 2. 3 – 4 mo bekeng
- ☐ 3. 5 – 7 mo bekeng
- ☐ 4. Ga fetisa ga 7 mo bekeng

4. Moshomo

4.1 Mmereko a bereka eng?

- ☐ 1. Administrative staff
- ☐ 2. Mooki

(Bula)

☐ 3. Allied medical practitioner

☐ 4. Ngaka

☐ 5. Mootledi/Driver

☐ 6. Batsamaise ba balwetsi/porter

☐ 7. Tse dingwe (thlalosa) ___________________

4.2 Ga o le ngaka ya allied, o dira tiro e feng? (If nya, feta potsiso)

☐ 1. Mosomo ya marapo

☐ 2. Occupational Therapy

☐ 3. Ngaka ya go thusa batho go bolela le go utlwella

☐ 4. Radiographer

☐ 5. Ngaka ya dijo

☐ 6. Tse dingwe (Thlalosa) ______________________

4.3 O dira mo lefapeng lefe gantsi? (kgetha e tee)

☐ 1. Administration

☐ 2. Ward 1 - Bana

☐ 3. Ward 2/4 – baimana/batswetse

☐ 4. Ward 5/6 – Batho ba ba golo

☐ 5. Thuso ya potlako

☐ 6. Balwetsi bao ba etelang sepetlele

☐ 7. Tse dingwe (thlalosa) _____________________

4.4 Ka diawara tse 8 tsa go bereka o tsea di awara tse kae o dutse fase?

☐ 1. 0-1 awara

☐ 2. 2-4 awara

☐ 3. 5-6 awara

☐ 4. Go fitisa awara se 6

(Bula)

4.5 Ka diawara tse 8 tsa go bereka o tsea di awara tse kae o emeletse?

☐ 1. 0-1 awara

☐ 2. 2-4 awara

☐ 3. 5-6 awara

☐ 4. Go fitisa awara se 6

4.6 Ka diawara tse 8 tsa go bereka o tsea di awara tse kae o sepela?

☐ 1. 0-1 awara

☐ 2. 2-4 awara

☐ 3. 5-6 awara

☐ 4. Go fitisa awara se 6

4.7 O na le go rwala dilo/batho ka nako ya go bereka?

☐ 1. Ee

☐ 2. Nnyaa

4.8 Ga e le ee, ke eng?

Difaele/dibuka

☐ 1. Ee

☐ 2. Nnyaa

Diphahlo

☐ 1. Ee

☐ 2. Nnyaa

Balwetsi

☐ 1. Ee

☐ 2. Nnyaa

Tse dingwe

☐ 1. Ee

☐ 2. Nnyaa

Thalosa ____

(Bula)

4.9 Go ya ka hlaloganyo ya gago, o na le got shwara ke sterese ko tiro ya gago?

- ☐ 1. Ga se nke se nswara
- ☐ 2. Ka nako engwe
- ☐ 3. e senge ka mehla
- ☐ 4. Ka nako tsohle
- ☐ 5. Go fitisa tekano

5. General health

5.1 O na le go tshweya ke malwetsi o feng, kgetha?

Balwetsi bja tshwekiri

- ☐ 1. Ee
- ☐ 2. Nnyaa

Madi a kwa godimo

- ☐ 1. Ee
- ☐ 2. Nnyaa

Bolwetsi bja marapo

- ☐ 1. Ee
- ☐ 2. Nnyaa

Tse dingwe

- ☐ 1. Ee
- ☐ 2. Nnyaa

Thlalosa ____

5.2 Mo kgweding tse 12 tsa go feta, o tseere sick leave ga kae?

- ☐ 1. 0 motsatsi
- ☐ 2. 1 – 6 motsatsi
- ☐ 3. 7 -12 motsatsi
- ☐ 4. go fitisa motsatsi a 12

(Bula)

5.3 Fa e le gore go kile ga nna le malatsi a a tserweng ko bongakeng a go itheetsa, a mo go one go ne go na le a a itebagantseng le botlhoko jwa mokwatla kwa tlase?

- ☐ 1. Ee
- ☐ 2. Nnyaa

5.4 A o a tsuba/goga motsoko?

- ☐ 1. Ee
- ☐ 2. Nnyaa

5.5 Ge a ba karabo ya gago e ke ee, o tsuba tse kae ka letsatsi?

- ☐ 1. 1-4
- ☐ 2. 5-10
- ☐ 3. 11-15
- ☐ 4. Go fetisa 15

5.6 Ga e ba karabo ya gago ke ee o tsuba gakankang?

- ☐ 1. Ka tlase a ngwaga o tee
- ☐ 2. 1 – 5 mengwaga
- ☐ 3. 6 – 10 mengwaga
- ☐ 4. Go fetisa mengwaga e 10

5.7 O nwa bjala na a?

- ☐ 1. Ee
- ☐ 2. Nyaa

5.8 Ga eba ke ee o nwa tse kae mo bekeng? (one unit is one glass of wine or beer or 25ml of spirits)

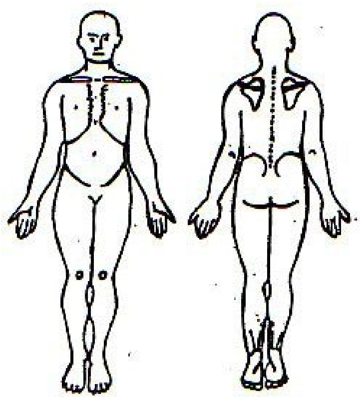
- ☐ 1. 1-2
- ☐ 2. 3-5
- ☐ 3. 5-10
- ☐ 4. Go fetisa 10

(Bula)

5.9 Ka nako e, o na le peini ya ko tlase ya mokokotlo (peini ya ditho tse re di shadileng mo se swantshong)

☐ 1. Ee

☐ 2. Nnyaa



5.10 Ga eba karabo ya gago ke ee, o kgonne bja go tlosa bohloko bjoo?
O bone ngaka naa

☐ 1. Ee

☐ 2. Nnyaa

Dihlare tsa go okobatsa bohloko

☐ 1. Ee

☐ 2. Nnyaa

Ngaka ya marapo

☐ 1. Ee

☐ 2. Nnyaa

Go se humane kalafe

☐ 1. Ee

☐ 2. Nnyaa

Tse dingwe

☐ 1. Ee

☐ 2. Nnyaa

Thlalosa ________________________________ (Bula)

5.11 O sa le wa ba le paini ya mokkootlo yak o tlase mengwaga e fetileng?

- ☐ 1. Ee
- ☐ 2. Nnyaa

5.12 Ga o na le mathata a mokokotlo mengwageng e fetileng, kopa o hlalose mengwaga le di kgwedi eo e thomileng

_________ ngwaga, le __________ kgwedi

5.13 O dirileng eng go okobatsa paine ya mokokotlo

O bone ngaka naa

- ☐ 1. Ee
- ☐ 2. Nnyaa

Ngaka ya marapo

- ☐ 1. Ee
- ☐ 2. Nnyaa

Dihlare tsa go okobatsa bohloko

- ☐ 1. Ee
- ☐ 2. Nnyaa

Surgery/operation

- ☐ 1. Ee
- ☐ 2. Nnyaa

Go se fumane kalafe

- ☐ 1. Ee
- ☐ 2. Nnyaa

Tse dingwe

- ☐ 1. Ee
- ☐ 2. Nnyaa

Thlalosa ________________________________

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Naude

CLEARANCE CERTIFICATE **PROTOCOL NUMBER M070359**

PROJECT	Lifestyle Factors Associated with Low Back Pain in Hospital Employees
INVESTIGATORS	Miss B Naude
DEPARTMENT	Physiotherapy Department
DATE CONSIDERED	07.03.30
DECISION OF THE COMMITTEE*	APPROVED UNCONDITIONALLY

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 07.04.18 **CHAIRPERSON** ....
(Professors PE Cleaton-Jones, A Dhai, M Vorster, C Feldman, A Woodiwiss)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : W Mudzi

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

DEPARTMENT OF HEALTH

DATE: 2006/03/16

NAME OF RESEARCH WORKER: BENITA NAUDE

TITLE OF RESEARCH PROJECT: LIFESTYLE FACTORS ASSOCIATED WITH LOW BACK PAIN IN HOSPITAL EMPLOYEES

OBJECTIVES OF STUDY (briefly or include a protocol):

- TO ESTABLISH THE PREVALENCE OF LOW BACK PAIN
- TO ESTABLISH THE RELATIONSHIP BETWEEN DEMOGRAPHIC DATA AND THE PRESENCE OF LOW BACK PAIN
- TO ESTABLISH THE RELATIONSHIP BETWEEN LIFESTYLE FACTORS AND LOW BACK PAIN

METHODOLOGY (briefly or include a protocol):

PERMANENT STAFF EMPLOYED AT TSHWANE DISTRICT HOSPITAL WILL BE GIVEN THE OPPORTUNITY TO PARTICIPATE BY COMPLETING A QUESTIONNAIRE ON PATIENT INFORMATION, RECREATION, OCCUPATION, GENERAL HEALTH, LOW BACK PAIN.

CONFIDENTIALITY OF PATIENTS MAINTAINED:

YES, NO NAMES ON QUESTIONNAIRES

COSTS TO THE HOSPITAL:

NONE

APPROVAL OF HEAD OF DEPARTMENT:

N/A

APPROVAL OF CRHS OF WITS UNIVERSITY: ETHICAL CLEARANCE NO - M030789

SUPERINTENDENT PERMISSION:

Signature: date: 2007/03/20

Subject to any restrictions: