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**Prevalence of Musculoskeletal Disorders among School
Teachers in the Thulamela Municipality of Limpopo Province,
South Africa.**

By

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*A mini-dissertation submitted in partial fulfilment of the requirements for the
degree of*

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Department of Public Health

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Declaration

I, Manyani Ndiafhi Daphney, Student no 11511511, hereby declare that the Mini-dissertation entitled **“Prevalence of Musculoskeletal Disorders among School Teachers in the Thulamela Municipality of Limpopo Province, South Africa”** hereby submitted to the University of Venda, School of Health Science, has not been submitted before for any degree or examination at this or any other University, and that it is my own work in design and execution and that all material contained herein has been duly acknowledged.

Signature.....

Date..... 27/01/2017

Dedication

This work is dedicated to my family, it would not have been possible without their love, caring and support, and to the memory of my late father, Frans Mushaisano Manyani , who passed on the love of reading and respect for education.

I would also like to acknowledge my supervisors Prof. DU Ramathuba and Dr. JT Mphahlele for their very valuable comments on this report dissertation. Without their passionate participation and input, the report dissertation would not have been successfully completed. I would also like to thank the Department of Education for granting me the permission to conduct the study. I am also grateful to all the school principals who gave the permission, time and a place to collect the data, not forgetting all the teachers who participated in this study. A special gratitude to the University of Venda for providing me with the study funds, this project would not have been possible without the financial support which I have received. I would like to thank Mr. VT Bwana from the English department for taking time out from his busy schedule to serve as my proof reader. Finally, I would express my very profound gratitude to my mother Mrs. Manyani and my children, for providing me with unfailing support and continuous encouragement throughout my years of study, not forgetting my colleagues at the Donald Fraser Hospice Psychotherapy Department who supported me through the process of data collection. This accomplishment would not have been possible without them.

Acknowledgement

First of all, I am grateful to the Almighty God for establishing me to complete this mini-dissertation.

I would also like to acknowledge my supervisors Prof. DU Ramathuba and Dr.JT Mabunda for their very valuable comments on this mini-dissertation. Without their passionate participation and input, the mini-dissertation would not have been successfully conducted. I would also like to thank the Department of Education for granting me the permission to conduct the study. I am also grateful to all the school principals who gave me permission, time and a place to collect the data, not forgetting all the teachers who participated in this study. A special gratitude to the University of Venda for providing me with the study funds; this project would not have been possible without the financial support which I have received. I would like to thank Mr VT Bvuma from the English department for taking time out from his busy schedule to serve as my proof reader. Finally, I must express my very profound gratitude to my mother Mrs. Manyani and my children, for providing me with unflinching support and continuous encouragement throughout my years of study, not forgetting my colleagues at the Donald Fraser Hospital Physiotherapy Department who supported me through the process of data collection. This accomplishment would not have been possible without them.

Keywords: Musculoskeletal Disorders, Prevalence, and Teachers

Abstract

Musculoskeletal disorders (MSDs) are a broad umbrella term to include a wide variety of disorders involving the joints and the soft tissues involved in moving those joints. Exposure to various risk factors present in the workplace may either contribute to the development of MSDs or aggravate a pre-existing condition. School teachers are among the group which appears to suffer from MSDs due to the nature of their job, which involves long- hours of standing, repetitive twisting and turning while teaching. The purpose of this study was to investigate the prevalence of musculoskeletal disorders among school teachers in the Thulamela municipality ward 25. The focus was more on factors associated with musculoskeletal disorders, symptoms, the effects and management of musculoskeletal disorders. The study was carried out using a quantitative, descriptive, cross-sectional design. The study was conducted in 10 schools from ward 25 Thulamela local municipality; there were 8 primary schools and 2 secondary schools. The targeted population was all school teachers working in primary and secondary schools located in ward 25 Thulamela municipality. The questionnaire was completed by 191 school teachers teaching in both primary and secondary schools in ward 25 Tshinane Circuit. The 68% of teachers who completed the questionnaire were female and 32% of teachers were males. The total sampling method was used due to the small number of teachers. Data was collected using a structured questionnaire and ethical aspects were taken into consideration. Data was analysed descriptively using the Statistical Package for Social Sciences 21.0 version. It was presented using graphs, tables and pie chart. The results showed that 63% of the teachers had musculoskeletal disorders; both individual and work related factors were found to be the risk factors of MSDs. The study showed that 65% of teachers who reported MSDs fall between the age of 41-55 years, and 56% of the teachers with MSDs have working experience of more than 16 years. The finding of the study also showed that 55% of teachers who do not exercise complained of MSDs. It was revealed that about 58% of teachers who complained of MSDs teach more than 300 students on a daily basis, and 63% of teachers who spent more than 7 hours in one position when teaching also reported MSDs. The common types of MSDs reported were shoulder pain (45%), back pain (33%), knee pain (8%), neck pain (12%) and hip pain (2%). The findings of the study call for Interventions based on prevention and control of the occurrence of MSDs in teachers

Keywords: Musculoskeletal disorders, Prevalence, and Teachers

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List of Acronyms

MSDs: Musculoskeletal disorders

SPSS: Statistical Package for Social Sciences

WMSDs: Work – related musculoskeletal disorders

LBP: Lower back pain

USA: United States of America

MSDs are some of the leading causes of ill health retirement among school teachers, while school teachers represent an occupational group among which there appears to be a high prevalence of MSD (Erick & Smith, 2011). Work-related musculoskeletal disorders (WMSDs) problems are the major complaints received from workers performing a repetitive task (Garcia & Steinhorn, 2012). A report from the Global Burden of Disease Study indicated that MSDs are the second leading cause of disability globally, and the burden has increased by 45% over the last 20 years (Steinhorn & Zwart 2014). MSDs such as arthritis and back pain affect over 1.7 billion people worldwide, and have the fourth greatest impact on the overall health of the world population, leading to both death and disability (Arthuro, Hannon & Russ 2013). Musculoskeletal conditions represent the sixth leading cause of death and disability, with only cardiovascular and circulatory diseases, neonatal diseases, respiratory, and mental and behavioral disorders, accounting for more deaths and disability worldwide (Crowfield, 2013). The Global Burden of Disease 2010 Study shows that 21.3% of the total years lived with disability in the world are attributable to MSDs, second only to mental and behavioral problems (Hoy, March, Brooks, Blyth, Woolf, Bain, Williams, Smith, Vos, Barendregt, Murray, Burstein, & Buchbinder, 2014). A review of the study done by Lusa, Morris and Giamber-Somers (2007) indicates that there is wide difference in the prevalence of LBP among Africans compared with that in developed countries. A one-year LBP prevalence among Africans ranged from 14% to 72% in the year 2007, and among Western societies, it was reported to be between 20% and 82%.

In the United States, musculoskeletal impairments rank as the most prevalent condition in chronic impairments, and a quarter of people in developed and less developed countries

CHAPTER 1

Introduction and Background

1.1. Introduction

Musculoskeletal disorders (MSDs) are believed to be one of the most common cause of severe long-term pain and physical disability, and it affects hundreds millions of people in the whole world (Wilson, Gormley & Hussey, 2011).

1.2. Background of the Study

MSDs are some of the leading causes of ill health retirement among school teachers, while school teachers represent an occupational group among which there appears to be a high prevalence of MSD (Erick & Smith, 2011). Work-related musculoskeletal disorders (WMSDs) problems are the major complaints received from workers performing a repetitive task (Gooyers & Stevenson, 2012). A report from the Global Burden of Disease Study indicated that MSDs are the second leading cause of disability globally, and the burden has increased by 45% over the last 20 years (Storheim & Zwart 2014). MSDs such as arthritis and back pain affect over 1.7 billion people worldwide, and have the fourth greatest impact on the overall health of the world population, leading to both death and disability (Atchison, Herndon & Rusie 2013). Musculoskeletal conditions represent the sixth leading cause of death and disability, with only cardiovascular and circulatory diseases, neonatal diseases, neoplasm, and mental and behavioral disorders, accounting for more deaths and disability worldwide (Crowfield, 2013). The Global Burden of Disease 2010 Study shows that 21.3% of the total years lived with disability in the world are attributable to MSDs, second only to mental and behavioral problems(Hoy, March, Brooks, Blyth, Woolf, Bain, Williams, Smith, Vos, Barendregt, Murray, Burstein, & Buchbinder, 2014). A review of the study done by Louw, Morris and Grimmer-Somers (2007) indicates that there is little difference in the prevalence of LBP among Africans compared with that in developed countries. A one-year LBP prevalence among Africans ranged from 14% to 72% in the year 2007, and among Western societies, it was reported to be between 20% and 62%.

In the United States, musculoskeletal impairments rank as the most prevalent condition in chronic impairments, and a quarter of people in developed and less developed countries

report chronic musculoskeletal pain (Theofilou & Panagiotaki, 2012). About 99.5% of WMSDs in the education profession were under-reported despite legislation in place to protect employees (Taylor, 2011). The results of the study done in New Zealand revealed that MSDs are the leading cause of disability and they affect one in four adults (Bossley & Miles, 2009). They further indicated that the cost of MSDs is estimated to be more than \$5,570 million a year. According to Mackay, Canizares, and Davis (2010), 22.3% of Ontario's population (2, 8 million people) saw a physician for an MSDs in ambulatory settings, and person visit rates were highest for arthritis and related conditions (107, 7 per 1,000 population), followed by trauma and related conditions (89 per 1,000 population), unspecified MSDs (71.0 per 1,000 population), bone and spinal conditions (62.4 per 1,000 population).

Neck pain was found to be common in European and North American populations, and nearly one-third of adults experienced neck pain in the course of a year and the prevalence of neck pain was 22% (Brattberg, Thorslund & Wikman, 2009).

According to Adebajo and Gabriel (2010), musculoskeletal health has been almost completely neglected in most of sub-Saharan Africa due to inadequate resources. They further indicated the great challenge in the management of MSDs, of which 800 million people are served by less than 20 rheumatologists, excluding South Africa. Thirty thousand South Africans were found to be suffering from neck or back pain annually, with 10% of them becoming chronic sufferers (Collins, Van Rensburg & Patricios, 2011). The results of the study done by Parker and Jelsma (2010) in the clinics around Cape Town, South Africa revealed that over one third of clinic attendees had musculoskeletal conditions not due to trauma or previous injury. They further indicated that the high prevalence rates of musculoskeletal conditions highlighted the need for appropriately trained health care practitioners at primary health care centres and a need to plan appropriate services in primary health care facilities. The study by Usenbo, Kramer, Young and Musekiwa (2015) where they included 27 cross-sectional studies (20 population-based and 7 hospital-based) from Africa, indicated that Rheumatoid arthritis in urban settings ranged from 0.1% in Algeria, 0.6% in the Democratic Republic of Congo, to a meta-analysis overall prevalence of 2.5% in South Africa, and in rural settings it ranged from a meta-analysis overall prevalence of 0.07% in South Africa, 0.3% in Egypt, to 0.4% in Lesotho. They further indicated that Osteoarthritis was the most prevalent form of arthritis with a prevalence rate

of 33.1% in South Africa. The results of the study done in Bloemfontein , Free State by (Copley, Cloete, Murrell, Basson, and Maree (2013) revealed that 45.82% of the study population reported the presence musculoskeletal conditions during the past three months, not relating to an injury, and some of those participants experienced mild to moderate functional impact according to the disability index.

1.3. Problem Statement

Based on the present researcher’s observation from her working situation, there is an increase in musculoskeletal complaints among the teachers, this is a cause for concern in this occupational group. The commonly reported complaints among school teachers who consulted the Physiotherapy Department on her workplace were backache, shoulder, and wrist and knee pain. MSDs increase sick leave and early retirement among school teachers, which posed potential threats to the performance of the students, and economic decline due to increased health costs Oke & Adeyekun (2013).

Table1 show the statistics of those that consulted in budget year 2013/2014.

| Year | Number of teachers | |
|-------------|--------------------|----|
| 2013 | | 15 |
| 2014 | | 23 |
| Grand total | | 38 |

1.4. Rationale of the Study

School teachers are more likely to develop musculoskeletal disorders due to the nature of their daily work, which involves prolonged standing, sitting and awkward posture. However, there is inadequate documented information regarding the prevalence of MSDs among school teachers in the Thulamela Municipality. Therefore, the researcher found a need to identify the prevalence of MSDs in this population, in order to develop prevention strategies and health promotion interventions to curb the cause of MSDs in this population.

1.5. The Significance of the Study

The findings of this study might assist the Department of Education and policy makers to understand the risk factors of MSDs which affect the well-being of teachers and production in ward 25 Thulamela Municipality schools. When the factors are known, the department of education may be in a good position to develop policies to reduce the risk factors of this condition. In addition, the findings of the study may also help the Department of Education to develop specific interventions to prevent musculoskeletal disorders among this profession. These interventions would positively contribute in reducing absenteeism rates at work, early retirement and cutting off of associated medical costs, all of which could lessen the economic impact of MSDs on individual teachers and the government in general. The findings of this study could also assist the Department of Health to improve strategies such as awareness and prevention of MSDs among school teachers, and could be useful in recommending changes in the work-environment and the lifestyle of the school teachers. Finally, the study might assist future researchers who want to research on related topics, as they may use the recommendations of the study to identify the prevalence of MSDs among teaching profession.

1.6. The Purpose of the Study

The purpose of the study was to determine the prevalence of musculoskeletal disorders among school teachers in the Thulamela Municipality.

1.7. Objectives of the Study

The objectives of this study were the following:

- To investigate factors associated with musculoskeletal disorders in school teachers.
- To identify the management of the musculoskeletal disorders.
- To assess the effects of musculoskeletal disorders at work and social life.

1.8. Definition of Terms

CHAPTER 2

Prevalence - according to Houghton (2011) prevalence is the total number of cases of a disease in a given population at a specific time. In the current study, prevalence refers to the total number of teachers who reported muscle and joint pains.

Musculoskeletal disorders - are the disorders of the muscles, nerves, tendons, ligaments, joints, cartilages and spinal discs, and they may also encompass work-related injuries (Segen's Medical Dictionary, 2011). In the study, MSDs refer to recurrent pain in the joints and muscles which last more than a month.

According to the Oxford Advanced Learner's Dictionary (2010) - a teacher is a person whose job is teaching, especially in a school. In the current study, a teacher will be a full - time teacher who works in any type of school teaching students.

Among teachers in various nations such as Turkey, China, Australia, Brazil, Sweden, United States of America, Germany, Estonia, Japan, Malaysia, Philippines, France and Greece showed the prevalence rates of MSDs of between 40% and 95% compared to other working groups (Mozurka & Jorawa 2015). In Thailand Chaikilng and Suggarawalai (2012) found that the prevalence of repetitive strain injuries among teachers in six months was 73.7%. They further mentioned that teachers with a chronic disease had a significantly higher risk of developing repetitive strain injuries compared to teachers without a chronic disease. In Brazil, the prevalence of musculoskeletal symptoms was 88.7% and 84.3% of the symptoms were work related and worsened with teaching activities (Lima Junior & Silva, 2014). Samad, Abusaleh, Mohi, and Toraih (2010) found that 40.4% of Malay teachers and 40% of Chinese primary school teachers reported back pain in the 12 months prior to the study. The study done by Dawlati and Al-Zuhair (2015) in Saudi Arabia showed 70.17% prevalence of musculoskeletal pain among female secondary school teachers. In India Rahman and Wankar (2013) showed that there was a significant correlation between the altered scapular pain and perceived shoulder pain and disability among teachers. Hong Kong teachers showed a higher prevalence of the neck (63.8%), shoulder (73.4%) and low back pain (58.2%) in the previous 30 days.

It is worth noting that the sample of Hong Kong teachers showed the significantly higher prevalence of all single musculoskeletal complaints than the Norway sample in one study.

CHAPTER 2

Literature Review

2.1. Introduction

This chapter is based on existing literature, it will provide an overview of the prevalence of MSDs in the teaching profession, and it will also provide the risk factors contributing to MSDs as well as the effect of MSDs among school teachers.

2.2. Overview of MSDs

The MSDs represent one of the most common and important occupational health problems in the teaching profession, which although long neglected, have drawn great attention in recent years (Eric & Smith 2011). The results of a study done among teachers in various nations such as Turkey, China, Australia, Brazil, Sweden, United States of America, Germany, Estonia, Japan, Malaysia, Philippines, France and Greece showed the prevalence rates of MSDs of between 40% and 95% compared to other working groups (Mesaria & Jaiswal 2015). In Thailand Chaiklieng and Suggaravetsiri (2012) found that the prevalence of repetitive strain injuries among teachers in six months was 73.7%. They further mentioned that teachers with a chronic disease had a significantly higher risk of developing repetitive strain injuries, compared to teachers without a chronic disease. In Brazil, the prevalence of musculoskeletal symptoms was 85.7% and 64.3% of the symptoms were work-related and worsened with teaching activities (Lima Junior & Silva, 2014). Samad, Abdullah, Moin, and Tamrin (2010) found that 40.4% of Malay teachers and 40% of Chinese primary school teachers reported back pain in the 12 months prior to the study. The study done by Darwish and Al-Zuhair (2013) in Saudi Arabia showed 79.17% prevalence of musculoskeletal pain among female secondary school teachers. In India Rahman and Warikoo (2013) showed that there was a significant correlation between the altered scapular pain and perceived shoulder pain and disability among teachers. Hong Kong teachers showed a higher prevalence of the neck (68.9%), shoulder (73.4%) and low back pain (59.2%) in the previous 30 days.

It is worth noting that the sample of Hong Kong teachers showed the significantly higher prevalence of all single musculoskeletal complaints than the Norway sample in one study

Chong & Chan (2010). The results of a study by Lawrence (2012) in Nigerian nursery schools showed that 85% of the staff had experienced pain and discomfort in their lower back and 57% had experienced neck trouble during the previous year as well as pain in their shoulders (55%) knees (49%), hips (45%) and ankles (31%). A review of the study done by Eric and Smith (2011) in Botswana showed that the prevalence of self-reported MSD among school teachers ranged between 39% and 95%. In Egypt, it was found that almost all teachers (98%) suffered MSD during their career time due to the nature of their job. As regards to the onset of pain, 78.5% reported that the pain started gradually while 21.5% reported that it started suddenly (Ebied, 2015).

2.3. Commonly Reported MSDs

Musculoskeletal complaints, especially of the lower back, neck, and shoulders, are also common among teachers due to prolonged desk work, prolonged standing in class and repetitive overhead writing on the board, prolonged sitting resulting from frequent reading, preparation of lessons, marking of assignments, and working on the computer (Erick & Smith, 2011; Yue, Liu, & Li, 2012). Ceballos and Santos (2015) found that pain in the shoulder, upper back, neck and ankles and or foot pain are the commonly reported musculoskeletal complaints among teachers, all of which were being associated with sociodemographic factors, physical and mental health, and teachers' well-being at work. A study by Odole, Gbiri, Sobiyi, and Oketola (2013) in Nigeria showed a high prevalence of MSDs, (78.9%) of which neck pain had the highest prevalence. It is also found that 36.1% was associated with environmental factors such as writing on the board and preparation of lesson notes, which involve much bending of the neck. The results of the study by Ogunbode, Adebusoye and Alonge (2013) revealed the prevalence rate of about 46.8% in the LBP; the pain was associated with occupational activities, the history of back injury and tobacco smoking.

2.4. Factors Associated with MSD

The WMSDS develop over time and are caused either by the work itself or by the employees' working environment. Many factors at work could predispose people to develop MSDs. Physical factors, psychosocial factors, and the work environment was reported as the major cause of MSD among workers, including teachers. Ekpenyong and Inyang (2014)

showed that the overall prevalence of WMSDs was 39.3% and was associated with individual and workplace-related risk factors. They further indicated that physical factors constituted the greatest risk (41.6%), followed by psychosocial (29.5%) and individual (28.9%) factors.

2.4.1. Individual Factors

Individual factors such as age, gender, smoking, weight, lack of exercise and duration of employment have been found to contribute to MSDs.

2.4.1.1 Age

Teachers aged 40 years and above were more than two times more likely to develop LBP, compared to those who were younger than 30 years of age (Beyen ,Mengestu, & Zele 2013). Similar results were found in a study by Yue, Liu and Li (2012) which indicated that the age group with the highest prevalence of neck shoulder pain was between 40–49 years of age. Karwan, Azuhairi, and Hayati (2015) found that the prevalence of upper limb disorders was much higher among older groups over 37 years with a prevalence rate of (82%), compared to younger age groups of less than 37 years (53 %). Darwish and Al-Zuhair (2013) found that musculoskeletal pain disorders were likely to become more prevalent as the population ages, the governmental school had higher prevalence of musculoskeletal pain compared to private secondary school teachers because 46.7% of governmental school teachers were over 40 years, while only 15% private school teachers were above 40 years. Rahman and Warikoo (2013) also found that there is a relationship between age and shoulder pain, meaning that the older you become, the higher the chances of shoulder pain.

2.4.1.2 Gender

Gender was associated with the development of lower back pain; female teachers were more than three times likely to experience LBP, compared to males (Holmstrom,Lindell & Mortz 2012). The prevalence of neck pain in women was found to increase with age. In Hong Kong, Lau, Sham, and Wong (2006) showed that a one-year prevalence of neck pain was 15% in men and 17% in women. Eric and Smith (2011) suggested that women might be more likely to report pain than men because women have the lower physical strength or

simply the fact that men and women have different traditions and thresholds for when and how they report pain. Cardoso, PdeQueiroz BatistaRibeiro, deAraújo, Carvalho, and dos Reis (2009) found that musculoskeletal pain was higher in women than men for the three body segments namely lower limbs, upper limbs, and back. The gender difference may be explained by many factors, one of which could be that the women had in which they were more likely to suffer emotional exhaustion compared with male teachers. This may also be explained partially by women having a lower pain threshold than males.

2.4.1.3 Smoking

Abate, Vanni, Pantalone and Salini (2013) revealed that smoking has been associated with back pain, independently from confounding factors such as age, sex, physical activity, lifestyle habits, and coughing due to respiratory diseases, which may contribute to exacerbate the symptom. They further indicated that there were association between smoking and disc degeneration that include an adverse toxic activity of nicotine itself, increased degradation of collagen, and decreased blood and oxygen supply, resulting from the vascular damage, and/or vasoconstriction of the vascular network surrounding the inter-vertebral discs. Beyen et al. (2013) found that smoking; sleep disturbance, previous injury and number of children to be the contributing to the development of lower back pain.

2.4.1.4. The level or type of school

Erick and Smith (2011) found that level or type of school to be positively associated with the development of MSDs as the work tasks of teachers vary depending on the level and type of school they are teaching. They also revealed that nursery school teachers were more likely to report lower back pain due to the type of their job, which involves too much of bending. Elementary and pre-college school teachers were also found to be very vulnerable to musculoskeletal pain because they spend most of the time doing repetitive standing and moving around, monitoring the learners while teaching (Abdulmonen, Hanan, Elaf, Haneen & Jenan, 2014). The results from a study by Mohsen, Bandpei, and Ehsan (2014) showed that high school teachers seemed to be more prone to LBP than primary school teachers.

2.4.1.5. Teaching experience

Rahman and Warikoo (2013) concluded that teachers with five years and more teaching experiences have a greater risk of developing shoulder pain, which may result in disability. Similar results were found by Cardoso et al. (2009) indicating a positive association of MSD and years of teaching.

2.4.1.6. Exercises

Lack of physical activity was associated with increased odds of WMSDs among the participants in this study even after adjusting for possible confounders, suggesting that physical activity may be important in reducing WMSDs of drivers.

2.4.2. Physical Factors

The poorly designed work environment of the classroom found to have a direct impact on the productivity of the teachers resulting in their poor health and quality of teaching (Mesaria & Jaiswal, 2015). The known highest prevalence rate of MSD among school teachers was due to physical factors at work. Several work-related factors have been correlated with the development of MSDs in the teaching profession. These factors include higher workload, for example, excessive paperwork, class preparation and students' evaluation, lack of communication in the workplace, as well as excessive demands from colleagues and supervisors. Heavy workloads have been reported as a risk factor for shoulder, back and elbow pain among Turkish teachers (Durmus & Ilhanli, 2012).

Prolonged standing or sitting, working in an awkward posture, writing with an elevated arm on the board, hand activities such as writing and typing, are common in teachers' work; these mechanical factors alone or in combination with other factors may be responsible for musculoskeletal symptoms (Samad et al. 2010; Baskurt, Başkurt & Gelecek, 2011). Posture characterized by twisting has also been associated with the development of lower back pain, whereas prolonged standing has been closely associated with neck/shoulder pain (Yue, Liu, and Li, 2012). Work postures have also been related to MSD in the teaching profession (Xu, Li, and Liu, 2011). The results of a study by Lima Junior and Silva (2014) showed the high prevalence of musculoskeletal symptoms of 85.7 %, while 64.3% reported that symptoms are work-related to and worsened with teaching activities. Prolonged

exposure to unfavourable working conditions was found to play a role in the occurrence of MSD (Korkmaz, Cavlak, and Telci, 2011; Yue et al., 2012]). Activities such as the stereotyped repetitive use of head down posture, heavy external loading, and frequent lifting of heavy loads, awkward working positions and injuries are the physical factors contributing to MSDs.

According to Chaiklieng and Suggaravetsir (2012) work characteristics and work environment, such as teaching posture were, mostly switched between standing and sitting (78.8%), followed by only standing (18.1%) and the least was only sitting (3.1%). Teachers had complained of getting back pain from using computers (41.8%) while 35.8% had to stretch to write on the boards. Holmstrom et al. (2012) showed that physical factors did contribute significantly to neck shoulder pain if confounders such as age, individual and employee-related factors were excluded. They also found that long working hours with the hands above shoulder level showed the most significant relationship to neck and shoulder pain. Thus, overhead posture may be risk factors for neck pain in teachers. The nature of the teaching job included frequent reading, marking of assignments as well as writing on the blackboard. Poor posture and improper techniques of lifting or carrying are two things which are common causes of low back pain. Nilahi (2014) found that teachers with higher number of class periods (four to six teaching periods per day) have a high prevalence of lower back pain (72.7%), and (52.2%) of those teachers were female. He further revealed a higher prevalence of lower back pain (69.2%) among the teachers with many working hours (7 to 9 hours per day), of which 65.4% were female. He further indicated that a higher prevalence of lower back pain (58.0%) among the teachers was associated with a higher number of students (45 to 50 students per class), of which 50.0% were female.

2.4.3. Psychosocial Factors

Psychosocial factors, which include psychological risk factors, refer to the individual perception of the job characteristics, which can promote positive feedback (motivation and satisfaction) and stress. The more psychological demands needed for certain tasks, the greater is the possibility to develop musculoskeletal disorder; whatever the anatomical area is involved (Lanfranchi & Dubeau, 2008). Unfavourable teaching circumstances may also lead to stress, with consequences to physical and mental health and impact on professional performance (Cardoso, et al. 2009). According to Erick and Smith (2014) psychosocial risk

factors such as poor mental health, low colleague support, high anxiety and low job satisfaction, were associated with MSDs. Psychosocial factors such as high workload/demands, high perceived stress level, low social support, low job control, low job satisfaction and monotonous work are most likely associated with MSD (Erick & Smith, 2011; Mesaria & Jaiswal, 2015). According to Park and Jang (2010), the psychosocial variables in the job demand-control-support model are related to musculoskeletal symptoms, together with physical factors. These variables are reported to increase work-related stress. The job demand-control-support model is a well-known job strain model which consists of three psychosocial factors namely job demand, job decision latitude, and social support as a basis dimension. The demanding working situations due to large classes, shortage of resources and inadequate payment for the job were the possible cause of the high occurrence of self-reported MSDs by 40% and 95% among school educators (Mesaria & Jaiswal, 2015). According to Yue et al. (2012) teachers who work in high schools have significantly higher risks of neck shoulder pain and lower back pain due to emotional exhaustion which correlates with the high amount of weekly lessons. The results of a study done by Mariammal, Jaisheeba and Sornaraj (2012) showed that about 67.93% of teachers had reported the presence of general body pain due to their routine teaching activity and factors such as misbehavior, disobedience, classroom indiscipline of students, which create a poor working environment which leads to stress in teachers.

Vignoli, Guglielmi, and Balducci (2015), found that exposure to bullying behaviors was linked to MSDs (in the low back, upper back, and neck regions). They further indicated that bullying has both the direct effect of a psychosocial factor and the indirect effect of psychological strain manifesting as MSDs.

2.5. The Effects of MSDs

Chen, Gupte and Akhtar (2012) found that the burden of MSDs is poorly recognized, yet the impact is very high in terms of the individual's ability to work, and they also revealed that MSDs has the highest indirect health and social care costs in high-income countries. Ebied (2015) found a very high prevalence of musculoskeletal pain among school teachers, which affects their work, by missing out working days and eventually affecting the education system as a whole. The findings of the study strengthen the assumption that characteristics of certain work activities have negative effects on the health of teachers. According to Erick

and Smith (2011) MSDs in education professionals decrease productivity at work due to sick leave, absenteeism, and early retirement. These may have negative implications for staff and schools. The study done in Botswana found that MSDs prevented some teachers from carrying out their normal activities, and caused some to change jobs or duties, reduce their activity at home and seek medical attention (Erick & Smith 2014). Statistics from the Department of Education (2013) found that 55% of teachers had, at least, one period of sickness absence a year, with an average of 8.1 days lost and a total of 2.2 million school days lost in the 2011-2012 academic year.

A study by Korkmaz et al. (2011) revealed a high prevalence of MSDs and it was severe enough to interfere with activities of daily living and for some teachers resulted in work absence and frequent painkiller usage. Similar results were found in a study by Darwish and Alzuhair (2013), which indicated that more than half (53.3%) of the teachers were absent from their work due to pain related to MSDs. According to Monteiro, Alexandre, and Ilmarinen (2009) the presence of MSDs affected several aspects of work ability, and it is associated with low work ability in relation to the physical and mental demands of work. In addition they further indicated that MSDs caused higher work impairments, sickness absence and poor prognosis. The results of the study done by OKe and Adeyekun (2013) in Sonographers revealed that about 4% of the respondents showed that they took sick leave due to MSDs

2.6. Management and Prevention of MSDs

According to Eric and Smith (2014) when addressing MSD in the teaching profession, it is very important to focus on prevention, and ergonomics training specific to risk factors of MSD should be introduced into teacher training institutions. Macdonald and Oakman (2015) found that the most effective workplace management of MSD risks requires a system-based management framework, more holistic assessment and control procedures to address risks from all relevant hazards together, rather than in isolation. An appropriate exercise programme has to be adopted, so as to alleviate pain and suffering among these school teachers (Abdulmonem et al., 2014).

Eric and Smith (2014) found that More than half (51.4%) of those who reported upper back MSD had seen a nurse, doctor or physiotherapist because of pain, with more than 40% of

teachers with neck, shoulder, hip/thigh, knee and ankle/feet MSD also having reported seeing a nurse, doctor or physiotherapist because of pain in these areas. Yi-Shiung, Shih-Fu and Hsin-Chi (2008) found that the musculoskeletal disorders had a negative impact on work ability and job performance and most of the workers (63.5%) received treatment (such as medication, physiotherapy, herb medicine, acu - puncture and manipulation) for musculoskeletal disorders. OKe and Adeyekun (2013) also found that more than half of the respondents sought different means of alleviating their symptoms, (29%) respondents took intermittent rest in between work whereas (18%) respondents use analgesic and (20%) consulted a physiotherapist.

2.7. Other Health Problems

Kovess-Masféty, Sevilla-Dedieu, Rios-Seidel, Nerrière and Chan Chee (2006) revealed a higher lifetime prevalence of rhinopharyngitis / laryngitis in both male and female teachers, conjunctivitis and lower urinary tract infection in male teachers and of bronchitis, eczema/dermatitis and varicose veins in female teachers. Chong and Chan (2010) revealed that the ten most frequently reported work-related health complaints among the teachers were tiredness, eyestrain, anxiety, voice disorder, sleep problems, shoulder pain, neck pain, headache, sadness/depression, and low back pain. Both the prevalence (92.4%) and intensity (mean: 2.43) of work-related tiredness were also very high. In addition they further revealed that teachers seem to be exhausted and fatigued with their work, and they suffered an average duration of seven days or longer in 38 out of 39 single health complaints. Zadeh and Fakhri (2011) found that unfavourable air conditioning and closed environment caused allergic reaction to the teachers and voice disorders were very common in their study, which involved primary school. The results of the study by Ebied (2015) found that half of teachers stated that they have chronic fatigue due to their job demands.

2.8. Summary

This chapter covered a review of relevant literature which covered the areas of research focused, putting more focus on the prevalence of MSDs on school teachers, factors associated with the development of MSDs, the effects and management of MSDs.

CHAPTER 3

Methodology

3.1. Introduction

The purpose of this chapter is to provide an overview of the research approach and methods used in this study. Furthermore the research methodology, research setting, study population and sampling method. In addition, it describes the study design, instrument, data collection procedures, statistical data analysis as well as ethical issues pertaining to this study

3.2. Research Approach

A quantitative approach was adopted. Quantitative research defined as the means for testing objective theories by examining the relationship among variables (Polit & Hungler 2013; Moxham 2012). The researcher chose this approach because it is more reliable and objective can also use statistics to generalise the findings. This approach is conclusive in nature because it gathers quantifiable information that can be used for statistical inference on the target population through data analysis.

3.3. Study Design

Bhattacharjee (2012) defined research design as a “blueprint” for empirical research that answers specific research questions or testing specific hypotheses. The Cross-sectional descriptive survey was followed in this study. Jackson (2009) defined cross-sectional descriptive study as a study in which the disease or condition and potentially related factors are measured at a specific point in time in a defined population. The outcomes include a description of the concept, identification of the possible relationship between concepts and development of the hypothesis that provide and the basis of future quantitative research. The researcher chose this method because it is very useful in obtaining an overall picture as it stands at the time of the study. This design was chosen to address the objectives of

the study, namely to determine the prevalence of MSD among school teachers, factors associated with MSDs, the effects of MSDs and the management of MSDs.

3.4. The Study Setting

The study was conducted in ward 25 Thulamela municipality, Vhembe District of Limpopo Province in South Africa. Thulamela municipality is one of the four municipalities in Vhembe District with 618,462 populations, 136,982 households and 68.81 poverty rate (Vhembe District Municipality Profile, 2011). This municipality falls under a Category B which situated within the Vhembe District in the far north of the Limpopo Province with the area of 5834km². It is comprised of 40 wards (Thulamela Municipality IDP Review, 2013/2014). Thulamela is comprised of the Kruger National Park forms the boundary in the east, while sharing the border with Makhado in the south and a south-west. It is the smallest municipality of four in the district, making up to 10% of the geographical area. It is the largest municipality in the province in terms of population. The name Thulamela is a Karanga word meaning the place of giving birth, and Thohoyandou is the main city. The study was conducted in ward 25 Thulamela local municipality, in all 10 schools located in ward 25 in the Thulamela Local municipality South Africa. The schools in ward 25 fall under Tshinane circuit and it comprises of only ten schools, three of them are secondary and seven of them are primary schools. Ward 25 Thulamela municipality is less than 20km away from Thohoyandou and comprises of three villages namely Vhufuli, Tshitereke and Ngwenani Ya Mapholi, with a population size of 15,326, the majority of whom speak Tshivenda language.

3.5. Study Population and Sampling

3.5.1 Population

Neuman (2011) defined population as the abstract idea of a large group of many cases from which a researcher draws a sample and to which results from a sample are generalised. Thulamela local municipality comprised of 40 wards and 440 schools. There are 127 secondary schools, 297 primary schools and 16 combined schools in Thulamela local municipality (Thulamela Municipality IDP Review 2013/14). This study population comprised of employed teachers in primary and secondary schools in ward 25.

3.5.2 Sampling and Sampling Method

Sampling is defined as the process of selecting participants from the population (McLeod, 2014). There are 27 circuit offices in in the district (Thulamela Municipality IDP Review 2013/14). The researcher selected all schools located in ward 25 Thulamela Municipality. The researchers chose this ward, because most teachers who consulted were working in the same ward. Total population sampling method was used because the size of the population was typically very small. The researcher selected all the employed teachers working in the ten schools. The total number of teachers teaching in all ten schools is 197.

Table 2 Total Number of Teachers per School

| | |
|------------------------------------|-----|
| 01.Tshivhase Secondary School | 72 |
| 02.Vhufuli Senior Primary School | 19 |
| 03.Tshadzume Lower Primary School | 11 |
| 04.Muhuyuwathomba Secondary School | 22 |
| 05.Gooldville Mission School | 10 |
| 06.Tshitereke Primary School | 14 |
| 07.Makhuvha Primary School | 12 |
| 08.Mphigalale Primary School | 09 |
| 09.Khadzinge Senior Primary School | 16 |
| 10.Ndikandafhi Primary School | 12 |
| Grand Total | 197 |

3.5.3. Sampling Criteria

All employed teachers who teach in schools located in ward 25 Thulamela municipality and teachers who signed the consent form, who were willing to participate in the study.

3.6. Measurement Instrument

In statistical terms, a research instrument is a survey, questionnaire, test, scale, rating, or tool designed to measure variable(s), characteristic(s), or information of interest, often a behavioral or psychological characteristic (Pierce, 2009). For the purpose of this study, a self-administered structured questionnaire (**Appendix E**) was used. According to McLeod

(2014), a questionnaire is a written interview, which provides information from a large sample of people. Structured questionnaire was chosen because they are the most suitable for this descriptive method of data gathering because they reduce biased error and increase the reliability of responses (Nichols and Childs, 2009). They are time-efficient because they require less time and energy to administer and responses are easy to code and interpret. A self-administered questionnaire was prepared in English and used to collect data because the researcher was dealing with teachers and they are educated and can understand English. A questionnaire consisted of 32 multiple-choice questions. Section A covered the Socio – demographic information of the participants, Section B covered the factors associated with MSDs, Section C focused on the symptoms of MSDs and Section D covered the management and the effects of MSDs.

3.7. Pre-Testing of the Instrument

Pre-testing is a method of checking that questions work as intended and are understood by those individuals who are likely to respond to them (Hilton, 2015). Pre-testing helped the researcher to identify questions that did not make sense to the respondents, or problems with the questionnaire that might lead to biased answers, and also help the researcher to find out the time spent to complete the questionnaire. The researcher conducted a pre-test on the instrument at Tswime secondary school. The instrument was administered at Tswime Secondary School on a small sample of 5 teachers. This school was chosen because it is located close to where the researcher lives, thus traveling costs was minimized. The findings of the pre-test showed medical terms such as musculoskeletal disorders was used, and it was difficult for the respondents to understand their meaning, and some questions were confusing the respondents and therefore the instrument was adjusted. The meaning of MSDs was well explained using the simple terms on the information sheet. It was simplified as disorders that affect muscle and bones. The time spent to finish the questionnaire was between 15-20 minutes. The results of the pre-test were used to improve the instrument and hence the methodology as a whole.

3.8. Data Collection Procedures

Data was collected at 10 schools which fall under Tshinane Circuit. A self-administered structured questionnaire was used to collect data to address all the objectives. The

researcher hand-delivered the questionnaire to the respondents in their schools during the day, introduced the questionnaire and clarified respondents where they did not understand. For those who were interested, they were then given consent forms to complete. The questionnaire was then administered and the researcher was there throughout the completion process.

After the completion of the questionnaire, the researcher collected them, after the collection of the questionnaire the researcher together with the assistants move to the next schools. Due to the large number of respondents in a short space of time (break time), the researcher made use of two assistants who were trained in data collection and ethics of research, however the researcher was fully engaged in the data collection process. The two assistants, who were the colleagues of the researcher volunteered to work for free throughout the data collection process. Research assistants were needed because some of the schools have more than one staff rooms. It was difficult for the researcher to attend them once at a time during break time because it was the only time allocated by the school principals for data collection. The response rate was 97% as some of the teachers refused to form part of the study group. The time spent to complete the questionnaire was between 15 – 20 minutes.

3.9. Data Management and Analysis

The researcher adopted data analysis steps as explained by Walliman (2011), which are the following: data reduction, data display and conclusion drawing. After data collection, the researcher reduced the information into manageable data. Data was coded and summarised to reduce the plenty information and make this information manageable. The Statistical Package for Social Sciences (SPSS) version 21.0 was used to analyse data. Data was then displayed in graphs and tables.

3.10. Validity and Reliability of an Instrument

3.10.1. Validity of the Instrument

Validity in research refers to how accurately a study answers, the study question or the strength of the study conclusions (Sullivan, 2011). Validity is concerned with whether the research is believable and true and whether it is evaluating what it is supposed or purports

to evaluate. Face validity was ensured in this study, the researcher ensured that a reasonably large portion of the questionnaire covers musculoskeletal disorders in general. All questions in the instrument except for demographic information only focused on the prevalence of the musculoskeletal disorders. The researcher ensured face validity by familiarising with literature and getting a clear understanding of musculoskeletal disorders based on the work of other authors

3.10.2. Reliability of the Instrument

In statistical terms, reliability is the ability of an instrument to measure something consistently and repeatedly (Buelow & Hinkle, 2008). To ensure reliability of the instrument, the researcher administered the same instrument twice (test-retest), one week apart to 5 teachers from Tswime Secondary School and compared the results. According to Bhattacharjee (2012) test-retest is a measure of consistency between the two measurements (tests) of the same construct administered to the same sample at two different points in time. The results of the test-retest indicated the instrument is reliable because the co-relation- coefficient(r) was 0,6.

3.11. Ethical Considerations

Ethics is defined as norms for conduct that distinguish between acceptable and unacceptable behaviour (Resnik, 2008). Ethical standards are very important in research as they promote the values that are essential to collaborative work, such as trust, accountability, mutual respect, and fairness.

The researcher presented the proposal to the School of Health Sciences Higher Degree Committee and to the University of Venda Higher Degree committee and then submitted the proposal to the Research Ethics Committee for ethical clearance (**Appendix F**). The researcher has also sought permission to conduct the study from the department of education, both in district (**Appendix G**) and circuit (**Appendix H**) and the permission to the principals of all ten schools. Each respondent had completed a consent form. For the purpose of this study the researcher gave special attention to the following research principles:

3.11.1. Protection from Harm

The researcher made sure that the research did not expose the participants to unnecessary physical or psychological harm. The respondents were assured that they are allowed to withdraw from the study should they feel they no longer want to proceed at any given time.

3.11.2. Informed Consent

Informed consent defined as the principle mechanism for describing the research study to potential participants and providing them with the opportunity to make autonomous and informed decisions regarding whether to participate (Marczyk, Dematteo & Festinger, 2005) Participants were given information sheets which provided further information on the study. Participants were given information sheets which provided further information on the study. Each potential participant was given a chance to voluntarily decide whether or not to take part in the study, based on the information provided. The participants were also given the information on what the research is all about, how it will affect them, as well as the risks and benefits. They were also told that they have the right to withdraw from the study at any time. It was made clear that any participation in the study was strictly voluntary. The researcher also explained to them in advance that there are no financial or material benefits that they will get, except that the information they are going to provide will benefit other people. Furthermore, a Consent form was given to each participant to complete the same day before filling in the questionnaire.

3.11.3. Anonymity

The participant's personal information was protected by making sure that the researcher was the only person who can access the information; all the participants remained anonymous. Clear instruction was given to the participants for not writing their names on the questionnaire in order to conform to the ethical principle of anonymity.

3.11.4. Honesty with Professional Colleagues

In this study, the researcher only analysed and report on the findings provided in the questionnaire. There was no fabrication of data to support a particular conclusion.

3.12. Summary

This chapter presented the methodology used in the study. The information provided included the research setting, approach and design that were selected for the study. The sampling procedure, the instruments and method of data collection used in the study was also highlighted. The ethical considerations applied to the study are also presented.

The chapter also presented the results that were expected to answer the objectives of the study. The following will be presented in this chapter: an overview of the socio-demographic profile of the school teachers that fall under Tarikane Circuit, the prevalence of MSDs in the study population, different factors associated with MSDs, the effects of MSDs at work and socially in the study population and methods used to manage the MSDs symptoms. The results of the study are summarised in the form of percentages and frequencies, using pie charts, tables, and graphs. The study findings are presented in sections namely demographic information, factors associated with MSDs, prevalence and the effects of MSDs.

4.2. Demographic Profile of the Respondents

Out of 197 school teachers who were approached only 130 of school teachers received the questionnaire and 121 questionnaires were completed and returned. The response rate of (97%) was achieved because some of the targeted research participants did not complete the questionnaire given and others were absent during the time of data collection.

Demographic information will cover the following: gender, age, marital status, and number of children below 15 years, level of education, total household income per month and teaching experience of the study population.

Presentation of the Results

4.1. Introduction

This chapter presents the results that attempted to answer the objectives of the study. The following will be presented on this chapter: an overview of the socio-demographic profile of the school teachers that falls under Tshinane Circuit, the prevalence of MSDs in the study population, different factors associated with MSDs, the effects of MSDs at work and socially in the study population and methods used to manage the MSDs symptoms. The results of the study are summarised in the form of percentages and frequencies, using pie charts, tables, and graphs. The study findings are presented in sections namely demographic information, factors associated with MSD, prevalence and the effects of MSDs.

4.2. Demographic Profiles of the Respondents

Out of 197 school teachers who were approached only 193 of school teachers received the questionnaire and 191 questionnaires were completed and returned. The response rate of (97%) was achieved because some of the targeted research participants did not complete the questionnaires given and others were absent during the time of data collection.

Demographic information will cover the following: gender, age, marital status, and number of children below 18 years, level of education, total household income per month and teaching experience of the study population.

Table 4.1 Demographic Information for the Respondents

| Characteristics | Frequency (n) | Percentage (%) |
|------------------------------------------------|---------------|----------------|
| Gender: | | |
| Male | 62 | 33 |
| Female | 129 | 68 |
| Age: | | |
| 0-25 Years | 2 | 1 |
| 26-40 Years | 43 | 22 |
| 41-55 Years | 132 | 69 |
| 56 and more | 14 | 7 |
| Marital status: | | |
| Single | 31 | 11 |
| Living with a partner | 22 | 12 |
| Married | 105 | 55 |
| Separated | 12 | 6 |
| Divorced | 11 | 6 |
| Widower | 10 | 5 |
| Total number of children below 18 years | | |
| 0 | 36 | 19 |
| 1 | 40 | 21 |
| 2 | 69 | 36 |
| 3 | 30 | 16 |
| More than 3 | 15 | 8 |
| Level of education | | |
| Certificate | 13 | 7 |
| Diploma | 67 | 35 |
| Bachelor's Degree | 111 | 58 |
| Total household income per month | | |
| R5000-R10000 | 31 | 16 |
| R11000-R20000 | 113 | 59 |
| R21000 and above | 46 | 24 |
| Teaching experience | | |
| 0-5 years | 08 | 3 |
| 6-10 years | 55 | 29 |
| 11-15 years | 57 | 30 |
| 16 years and above | 71 | 38 |

Table 4.1 above illustrates the demographic information of the study respondents. The study was dominated by female participants constituting (67%) of the study subjects, whereas male participants representing the remaining (33%) The majority of the

respondents constituting (69%) were aged 41-55 years, followed by (22%) who ranged between 26 and 40 years, and then followed by (7%) of teachers aged 56 years and above. Only (1%) of the participants were under the age of 25 years. The study was also dominated by participants who were married (55%), followed by participants who are single (17%) and then followed by those who are living with their partners 12%. Similar results of (6%) were revealed in divorcees and those who are separated from their spouses, widowers were represented by Small percentage of (5%). It was revealed that many teachers have 2 children under 18 years of age (35%) followed by teachers with 1 child under the age of 18 years (20%) and followed by those teachers who do not have children below 18 years was (19%).It was also revealed that there are few teachers having 3 children, 4 children and above.(16% : 8%) respectively. The study results were dominated by teachers with a bachelor 's degree (58%), followed by teachers with a diploma (35%) and teachers with the certificate was the lowest (7%).The study shows a high number of teachers with household income between R11000.00-R20000.00 (59%) followed by teachers with the amount of R21000.00 and above, the results also showed little percentage of teachers with the amount between R5000.00-R10000.00. The study was dominated by teachers with working experience of above 16 years (37%), similar results of teachers with working experience of 6-10 years and 11-15 years (29%) were also revealed. The study also shows the fewest percentage of teachers (3%) having 0-5 years teaching experience.

4.3. Factors associated with MSDs

To determine the factors associated with the development of MSDs, questions were distributed under individual, physical and environmental factors, and psycho-social factors.

4.3.1. Individual Factors

4.3.1.1. Physical Activity

The Figure 4.1 below indicates how the teachers were involved in doing physical activities. The results show that the majority of teachers do not exercise (59%), followed by teachers who exercises once a week (24%) and followed by those teachers who exercise only when they have the time (14%), there were (2%) teachers who exercise every.

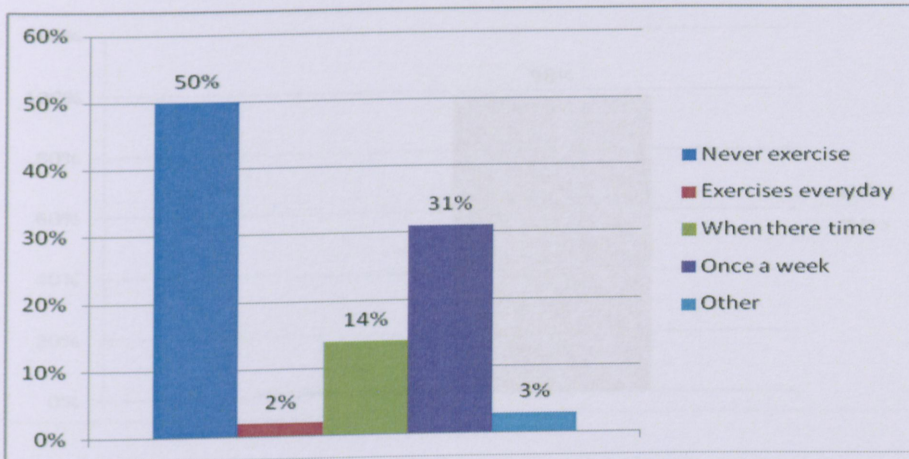


Figure 4.1. Physical activity

4.3.1.2. Alcohol consumption

The Figure 4.2 below indicates the alcohol consumption on the study population. The results of the study revealed that the majority of teachers do not drink any kind of alcohol (92%) while (5%) drink alcohol, and only (2%) of the teachers were occasional drinkers.

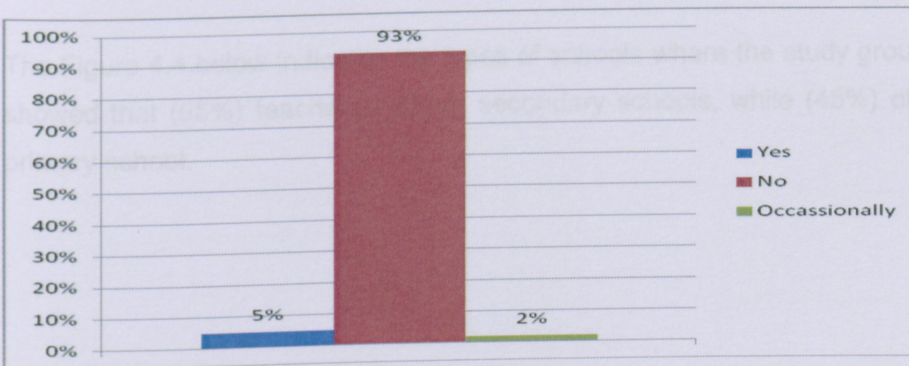


Figure 4.2. Alcohol consumption by the study population

4.3.1.3. Smoking History

Figure 4.3 below indicates smoking status of the study population. The study results were dominated by non – smokers (98%) and only (2%) of the teachers were smokers.

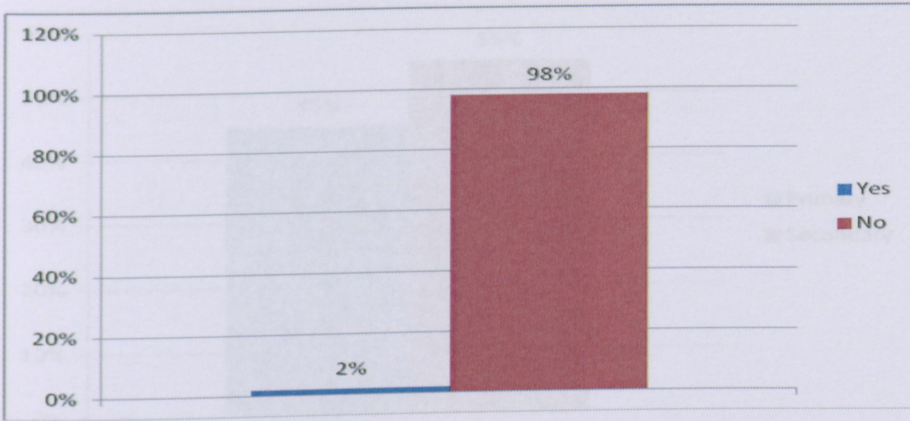


Figure 4.3. Smoking history by the study population

4.3.2. Physical factors and Environmental Factors.

Both physical and environmental factors were found to be the risk factors of MSDs.

4.3.2.1 Physical

4.3.2.1.1 School type

The Figure 4.4. below indicates the types of schools where the study group work. The study showed that (55%) teachers work in secondary schools, while (45%) of teachers work in primary school.

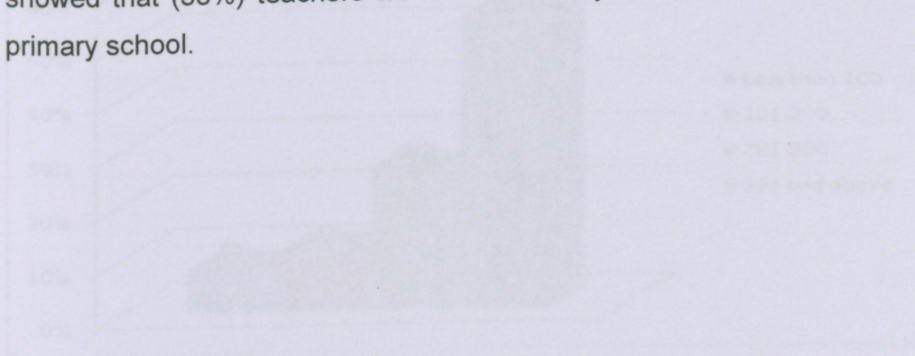


Figure 4.5. Number of students on a daily basis



Figure 4.4 School types

4.3.2.2. Total number of students taught on a daily basis

The Figure 4.5. below indicates the number of students in a daily basis. The study revealed that (54%) of teachers teach 200 students and above per day, followed by (25%) of teachers who teach between 151-200 students per day and the lowest group of teachers who teach between 101-150 students and less than 100 (11% ;8%) respectively.

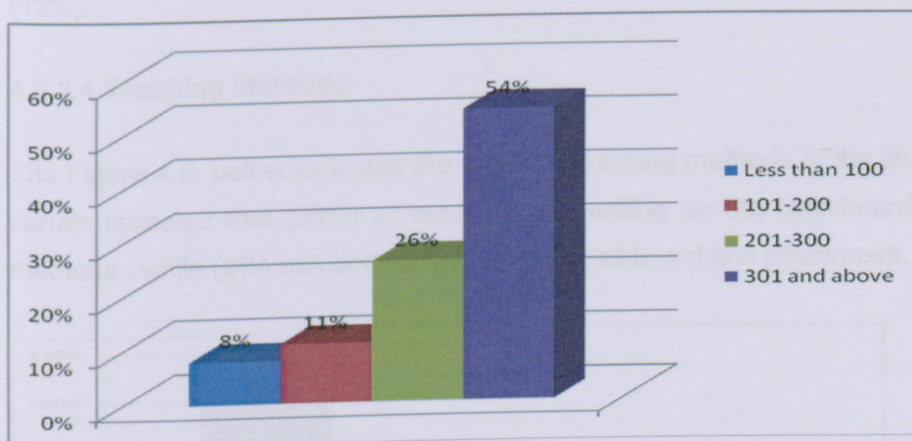


Figure 4.5. Number of students on a daily basis

4.3.2.3. The Amount of Workload on a Daily Basis

Table 4.2 Workload Done by Teachers on a Daily Basis

| Characteristics | Frequency (n) | Percentage (%) |
|--------------------------------|---------------|----------------|
| Time to prepare lessons | | |
| > 2 hours | 40 | 21 |
| 3-4 hours | 101 | 53 |
| 5-6 hours | 27 | 14 |
| < 7 hours | 23 | 12 |
| Time spent teaching | | |
| > 2 hours | 13 | 7 |
| 3-4 hours | 29 | 15 |
| 5-6 hours | 40 | 21 |
| < 7 hours | 109 | 57 |

The Table 4.2. above indicates the of workload done by teachers on a daily basis. The study shows that the majority of teachers spend between 3-4 hours preparing lessons on a daily basis (53%) followed by those spending less than 2 hours to prepare lessons. The lowest percentage was found in teachers who spend 5-6 hours (14%) and 7 hours and above (12%).

4.3.2.4. Teaching Methods

The Figure 4.6. below indicates the different teaching methods of the study population. The results revealed that (98%) of teachers use writing on the blackboard as their teaching methods, while (2%) use both writing on the chalkboard and powerpoint.

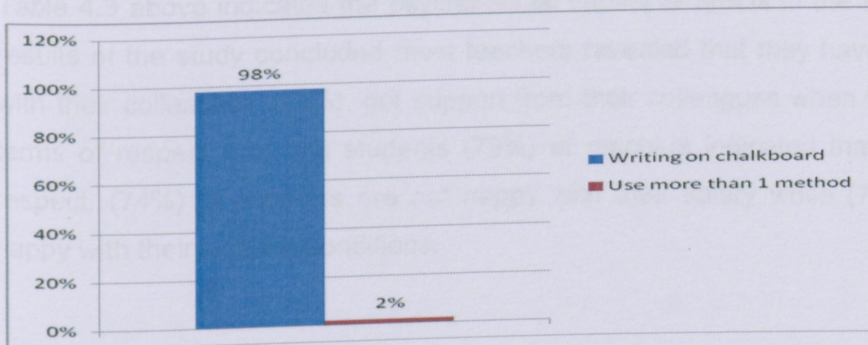


Figure 4.6. Teaching methods

Table 4.3 Psycho-Social Factors

| Characteristics | Frequency (n) | Percentage (%) |
|-------------------------------|---------------|----------------|
| Happy with working conditions | | |
| Yes | 135 | 71 |
| No | 31 | 16 |
| Sometimes | 25 | 13 |
| Happy with the salary | | |
| Yes | 39 | 20 |
| No | 141 | 74 |
| Sometimes | 11 | 5 |
| Stress in a workplace | | |
| Yes | 121 | 64 |
| No | 33 | 17 |
| Sometimes | 37 | 19 |
| Respect from students | | |
| Yes | 152 | 79 |
| No | 5 | 2 |
| Sometimes | 34 | 18 |
| Relationship with colleagues | | |
| Yes | 179 | 94 |
| No | 5 | 3 |
| Sometimes | 7 | 3 |
| Support from colleagues | | |
| Yes | 76 | 92 |
| No | 4 | 2 |
| Sometimes | 11 | 6 |

Table 4.3 above indicates the psycho-social impact of MSDs in the study population. The results of the study concluded most teachers revealed that they have a good relationship with their colleagues (94%), got support from their colleagues when they need it (92%). In terms of respect from the students (79%) of teachers indicated that students give them respect. (74%) of teachers are not happy with their salary while (71%) of teachers are happy with their working conditions.

it (92%). In terms of respect from the students (79%) of teachers indicated that students give them respect. (74%) of teachers are not happy with their salary while (71%) of teachers are happy with their working conditions.

4.4. The prevalence of MSDs

Figure 4.7. below indicates the prevalence of MSDs on the study population. The main symptoms of MSDs reported were pain in different types of the joints. The results of the study revealed the prevalence rate of (64%) amongst the study population.

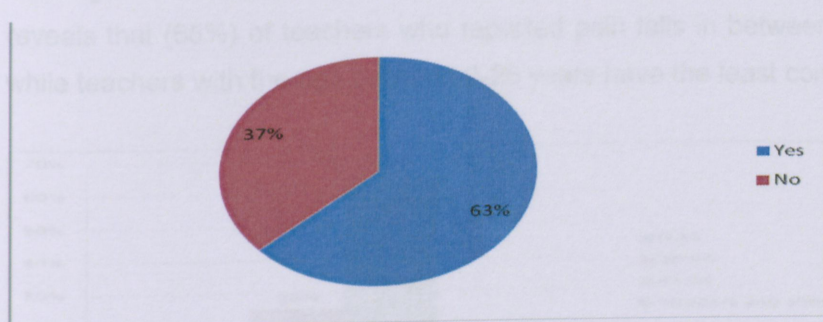


Figure 4.7 Teachers who reported MSDs symptoms

4.4.1. Area commonly reported of pain in the study population

The Figure 4.8. below indicates the common area reported of pain by the study population. The study revealed that many teachers reported pain on their shoulders (32%) followed by a backache (27%), knee pain was reported by (22%) of teachers, while (11%) of teachers complains of neck pain and the rest (6%) suffered from hip pain.

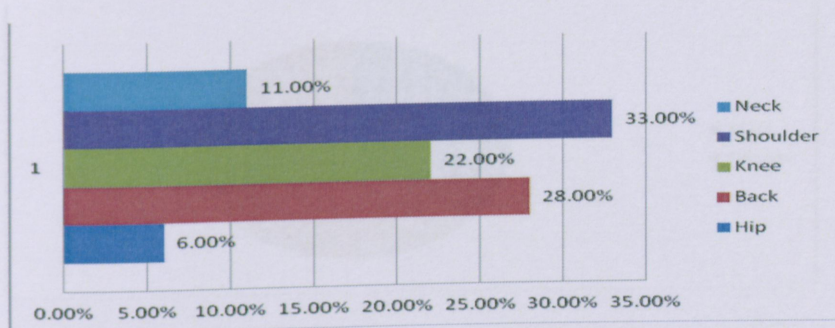


Figure 4.8. Area of pain

4.5. MSDs and Different Variables.

The prevalence of MSDs was estimated according to socio-demographic variables (age, gender, marital status, and number of children below 18 years, level of education, and characteristic of working such as teaching experience, number of students, time spent teaching on a daily basis.

4.5.1. MSDs and Age Differences

The Figure 4.9. below compared the prevalence of MSDs and age differences. The study reveals that (65%) of teachers who reported pain falls in between the age of 41-55 years, while teachers with the age between 0-25 years have the least complaints of pain (2%) .

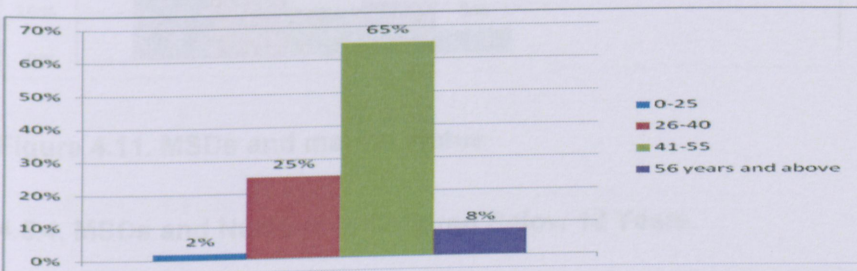


Figure 4.9. MSDs and age

4.5.2. MSDs and Gender Differences

Figure 4.10. below indicates MSD and gender. The results revealed a higher prevalence of MSD in women (63%) and lower prevalence in men (37%).

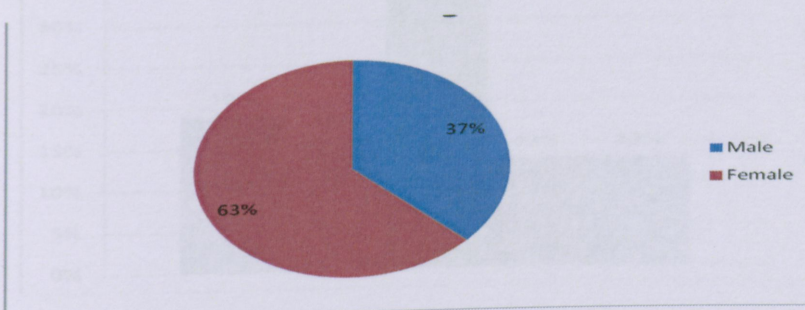


Figure 4.10. MSDs and Gender

4.5.3. MSDs and Marital Status

Figure 4.11 below compares MSDs and marital status. The results revealed that many teachers who reported MSDs were married (60%) followed by those who are single (14%) and the lowest were amongst the divorcees.

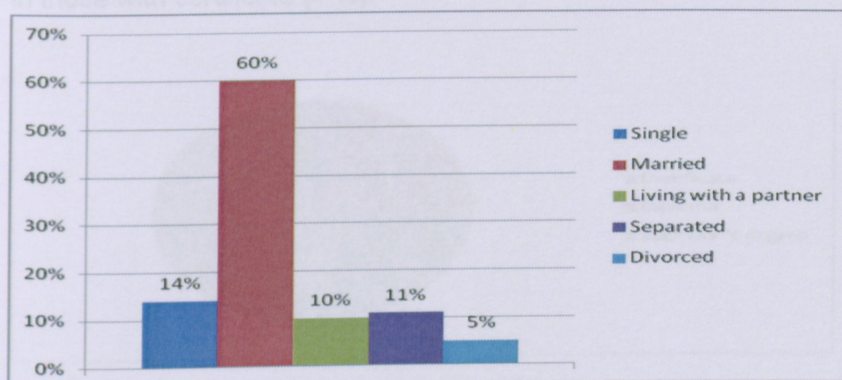


Figure 4.11. MSDs and marital status

4.5.4. MSDs and Number of Children Below 18 Years.

Figure 4.12. below compares the prevalence of MSDs and the total number of children below 18 years. The results revealed that teachers with 2 children have a higher prevalence of MSD (34%), followed by teachers with no children (19%) and an equal percentage of those teachers with children between 3 and above three of (13%) each

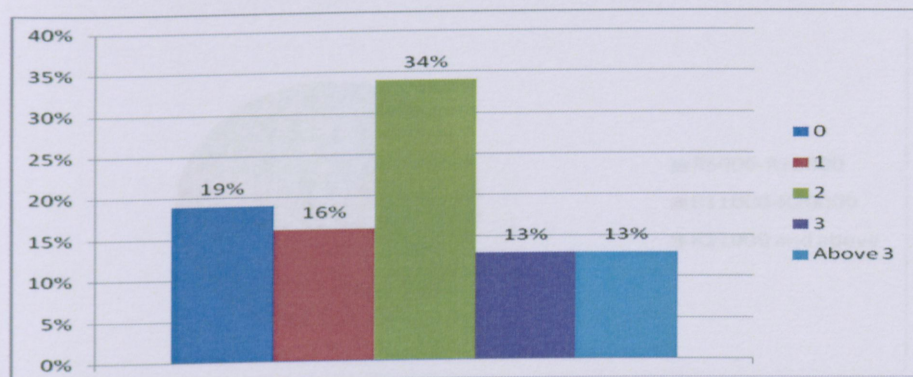


Figure 4.12. MSDs and number of children below 18 years

4.5.5. MSDs and Level of Education

The Figure 4.13. below compares the prevalence of MSDs and level of education on the study population. The results of the study revealed that was dominated by teachers with bachelor degree (75%), followed by those with diploma (21%) and the smallest were found in those with certificate (4 %).

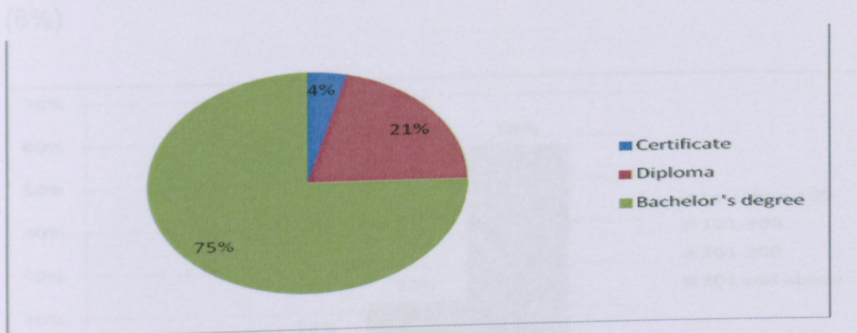


Figure 4.13. MSDs and level of education

4.5.6. MSDs and Total Household Income per Month

The Figure 4.14. compares the MSDs prevalence and total household income on the study population. The study revealed that teachers who have a total household income between R11000 - R20000 have a higher risk of developing MSDs (68%), followed by those teachers with a total household income of R21000 and above (19%) and lowest were found in those teachers with household income between R5000 - R10000 (13%).

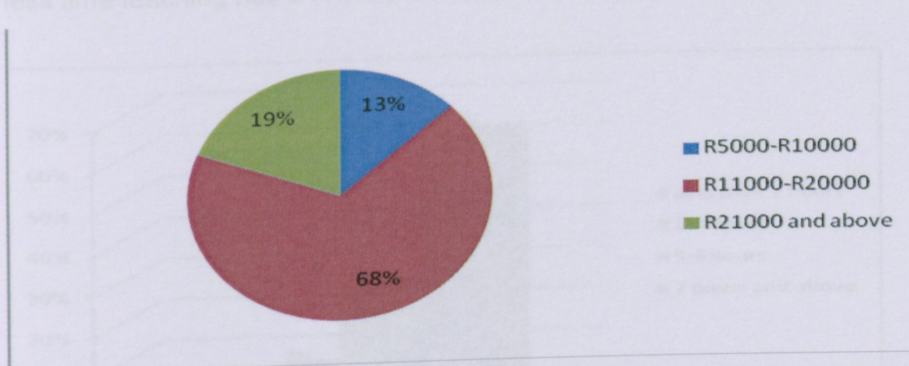


Figure 4.14. MSDs and household income

4.5.7. The MSDs and Number of Students on a Daily Basis.

The Figure 4.15. compares the prevalence of MSDs and number of student taught on a daily basis by the study population. The results of the study show a higher prevalence of MSDs of (58%) in teachers who teach more than 300 students on a daily basis .Teachers who teach a small number of students (less than 100) have a low prevalence rate of MSDs (8%)

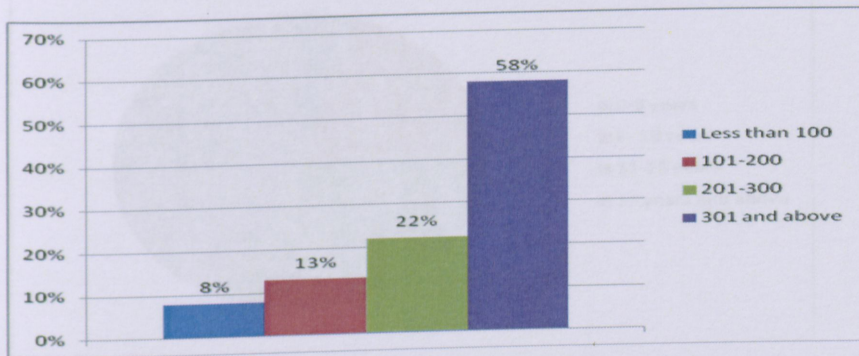


Figure 4.15. MSDs and number of students

4.5.8. MSDs and Time Spent While Teaching

The Figure 4.16. below compare the prevalence of MSDs and time spent teaching on a daily basis by the study population. The study showed that teachers who spend more than 7 hours teaching have higher prevalence rate of MSD (63%) and those teachers who spend less time teaching has a lower prevalence rate of (4%).

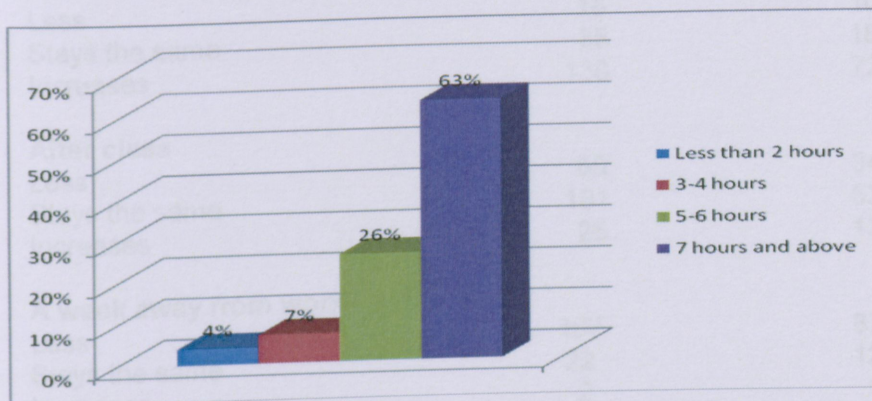


Figure 4.16. MSDs and time spent teaching

4.5.9. MSDs and Teaching Experience

The Figure 4.17. below compares the prevalence of MSDs and teaching experience on the study population. The study showed the highest prevalence of MSDs (46%) on teachers with 16 years and above teaching experience and lower prevalence rate (5%) on teachers with 0-5 years of teaching.

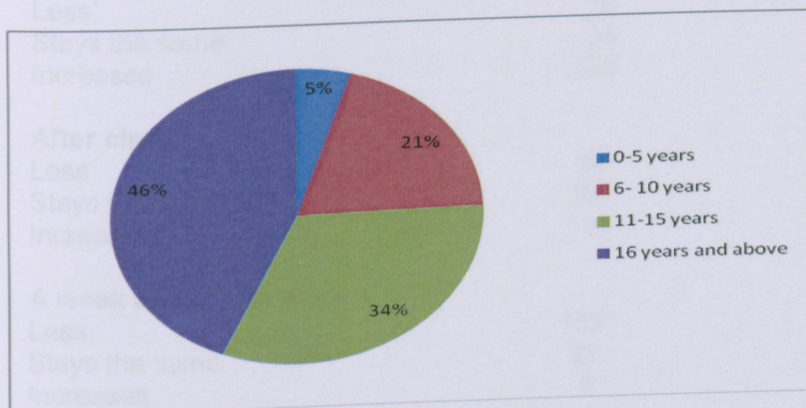


Figure 4.17. MSDs and teaching experience

4.6. The Effect of MSDs on Teachers

Table 4.4. The effects of MSDs on teachers

| Characteristics | Frequency (n) | Percentage (%) |
|------------------------------|---------------|----------------|
| At work | | |
| Less | 18 | 10 |
| Stays the same | 35 | 18 |
| Increases | 138 | 72 |
| After class | | |
| Less | 65 | 34 |
| Stays the same | 101 | 53 |
| Increases | 25 | 13 |
| A week away from work | | |
| Less | 167 | 87 |
| Stays the same | 22 | 12 |
| Increases | 2 | 1 |

4.6. The Effect of MSDs on Teachers

Table 4.4 The effects of MSDs on teachers

| Characteristics | Frequency (n) | Percentage (%) |
|------------------------------|---------------|----------------|
| At work | | |
| Less | 18 | 10 |
| Stays the same | 35 | 18 |
| Increases | 138 | 72 |
| After class | | |
| Less | 65 | 34 |
| Stays the same | 101 | 53 |
| Increases | 25 | 13 |
| A week away from work | | |
| Less | 167 | 87 |
| Stays the same | 22 | 12 |
| Increases | 2 | 1 |

Table 4.4 above indicates the effect of MSDs on the study population while at work and outside work.

4.6.1. Pain when Teaching

The results revealed that the majority of teachers (72%) reported that the pain intensity increases while teaching and (18%) reported that there is no difference in the amount of pain while the last (10%) revealed that the pain intensity reduces while teaching.

4.6.2. Pain after Teaching

The results of the study revealed that the majority of teachers showed that the pain remains the same after teaching (53%) and (34%) indicated that the pain reduces while (13%) shows that the intensity of pain increases.

4.6.3. Pain a Week Away From Work

The results of the study indicated that (87%) of teachers reported less pain a week away from teaching, while (12%) reported that the pain remain the same and (1%) of the teachers reported that the intensity of the pain increases.

4.7. MSDs interference in the Study Population

Table 4.5 The interference of MSDs on teachers

| Characteristics | Frequency (n) | Percentage (%) |
|-------------------------|---------------|----------------|
| At work | | |
| No interference | 103 | 54 |
| Some interference | 36 | 19 |
| Has to stop working | 53 | 27 |
| Social life | | |
| No interference | 72 | 38 |
| Some interference | 103 | 54 |
| Has to stop an activity | 16 | 8 |
| Sleeping | | |
| No interference | 55 | 29 |
| Some interference | 101 | 53 |
| Has to stop an activity | 35 | 18 |

Table 4.5 above indicates the pain interference in the study population. The results of the study revealed how the pain interferes with work, social life and sleeping.

4.7.1. Work Interference

The results revealed that (54%) of teachers carry on with their job without any interference, and (19%) reported some interference while (27%) has to take time off from their job.

4.7.2. Social Interference

The results of the study revealed that 54% of the teachers reported that pain causes some interference with their social life, 37% reported that pain does not interfere with their social life and only 8% indicated that stop doing an activity because of pain.

4.7.3. Sleeping Interference

The results of the study revealed that (53%) of the study population reported that the pain causes some interference when sleeping, while (29%) shows that pain does not interfere with their sleep and only 18% revealed that pain interfere with their sleep every night, and it even wakes them while sleeping.

4.8. Management of Pain

The study showed the different methods used by the study population to manage their MSDs symptoms. The study revealed that teachers presenting with MSDs use different methods to manage the pain. Some teachers take days off from work and others continue to work irrespective of their pain. The study also revealed that different health professionals such as doctors, nurses and physiotherapist were consulted in order to manage the pain.

Table 4.6 Management of MSDs by the Study Population

| Characteristics | Frequency (n) | Percentage (%) |
|--------------------------------------------------|---------------|----------------|
| Sick leave | | |
| Yes | 90 | 47 |
| No | 101 | 53 |
| Total number of days taken over six month | | |
| 1-5 days | 58 | 30 |
| 6-10 days | 93 | 49 |
| 11- 15 days | 29 | 15 |
| 16 days and above | 9 | 5 |
| Pain management | | |
| Clinic | 3 | 2 |
| General practitioner | 93 | 49 |
| Physiotherapist | 17 | 9 |
| None | 78 | 41 |
| Pain relief | | |
| Medication | 102 | 53 |
| Rest and medication | 38 | 20 |
| Rest and physiotherapy | 26 | 14 |
| Rest only | 18 | 10 |
| Nothing works | 6 | 3 |

4.8.1. Sick leave and the number of days taken by the study population

The results of the study showed that 53% of teachers who presented with MSDs took sick leave while (47%) never took any sick leave. The study also revealed that most teachers (49%) took between 6-10 days, followed by those teachers who took between 1-5 days (31%) and few teachers (6%) took 16 days and above sick leave.

4.8.2. Pain management and area of consultation by the study population.

The results of the study concluded that about (41%) of teachers do not seek any help for their pain management, whereas (49%) of teachers indicated that they consulted a general practitioner for the management of their symptoms followed by (9%) of those teachers who consulted a physiotherapist, the lowest percentage goes to a clinic for management (2%).

4.8.3. What relieve the pain?

The results of the study revealed that most teachers use pain medication (53%) to relieve pain, while other teachers (20%) take rest and pain medication to relieve pain. About (14%) indicated that physiotherapy relieve their symptoms, (10%) revealed that rest only relieve their symptoms while only (3%) reported that nothing works.

Table 4.6. below indicates different methods of pain management by the study population.

4.9. Other Health Problems

The study revealed that teachers also reported other health problems than MSDs. Figure 4.19 below revealed other health problem than MSDs on the study population. The (23%) of the teachers reported other health problems than MSDs and (77%) did not have any other health problems.

4.9.3. Summary

The findings of this study show that there is a higher prevalence of MSDs (64%) among school teachers. The study also revealed that most reported MSDs were shoulder pain (32.43%), back pain (27%), knee pain (22%), neck pain (11%) and hip pain (6%). It was evident in the findings that the individual, physical and environmental factors were amongst the risk factors of MSDs. The result also revealed that absenteeism rate was higher in teachers with MSDs (53%).

5.2. Demographic information

More than half of the study population (53%) were female and 47% were male. The study was conducted in the Ministry of Education, Saudi Arabia. The results revealed that 64% of the study population reported having MSDs. The results of the study are supported by a study conducted by Smith and Eric (2013) showing that musculoskeletal pain was reported by 64% of the study population. The study also found that lower limbs, upper limbs, neck, and back were the most common areas affected by many factors, one of which could be the physical environment. The study also found that women have higher prevalence of MSDs than men because women have higher prevalence of MSDs than men. The study also found that women have different traditions and beliefs than men.

The study found that 55% of the study population were aged between 41-55 years and the lowest prevalence of MSDs was reported by the study population of age 1-30 years. The results from the study are supported by a study conducted by Al-Zuhair (2013) showing that the prevalence of MSDs was higher in the study population of age 41-55 years. The study also found that the prevalence of MSDs was higher in the study population of age 41-55 years.

The study also found that the prevalence of MSDs was higher in the study population of children below 18 years. The study also found that the prevalence of MSDs was higher in the study population of children below 18 years.

CHAPTER 5

Discussion of the Results

5.1. Introduction

This chapter discusses the results of the study in relation to the research objectives. The main aim of this study was to determine the prevalence of MSDs amongst school teachers in ward 25 Thulamela municipality. The objectives of the study focused on the factors associated with MSDs, the symptoms of MSD, and the effect of MSD in teachers. The results were discussed with the reference to the literature.

5.2. Demographic Information.

More than half of the study population was women this means that schools which fall under ward 25 Tshinane circuit in Thulamela municipality are dominated by female teachers. The results revealed that MSD was higher in women 68% compared to men with 32%. The results of the study are supported by Cardoso et al. (2009) who also found that musculoskeletal pain was higher in women than men for the three body segments namely lower limbs, upper limbs, and back. The gender difference may be explained by many factors, one of which could be that there were many women compared to men in the study. Eric and Smith (2011) suggested that women might be more likely to report pain than men because women have lower physical strength or simply the fact that men and women have different traditions and thresholds for when and how they report pain.

The study reveals that 65% of the teachers who reported pain falls in between the age of 41-55 years and the teachers between 0-25 years have the least complaints of pain 1.80%. The results from the study demonstrates evidence that there older you grow the higher chances of developing MSDs, hence similar results were found by Darwish & Al-Zuhair (2013) showing that those musculoskeletal pain disorders were likely to become more prevalent as the population ages compared to young workers less than 37 years.

The study also revealed that following individual factors such as marital status, the number of children below 18 years, the level of education and household income had no impact to the occurrence of MSDs.

The results revealed that length of teaching experience has positive effect on the development of MSD, there was 56% prevalence of MSDs in teachers with more than 16 years teaching experience, and then followed by teachers with teaching experience between 11-15 years 28%. Teachers with less working experience have lower prevalence rates for example, the ages between 6-10 years have 14% and 0-5 years teaching experience 2%. The results are supported by the study done by Rahman & Warikoo (2013), they concluded that teachers with five years and more teaching experiences have a greater risk of developing shoulder pain, which may result in disability. Similar results were found by Cardoso et al. (2009) indicating a positive association of MSDs and years of teaching.

5.3. Factors Associated with MSDs.

It was revealed that exercises have great impact on the development of MSDs. The study findings showed that 59% of the teachers do not exercise, there was a higher prevalence rate of MSD was in those teachers who never exercise 55%, followed by teachers who exercise when there is time 23%. The lowest MSDs rate was found amongst teachers who exercise every day 5%. The findings are also supported by Karwan et al.(2013), who found that lack of exercise contributed to the disorders of the upper limbs among the staff members who worked in the public university of Malaysia.

More than 3 quarters of the study population were neither drinkers and nor smokers, and the results never revealed that alcohol consumption and smoking as contributing factors to the development of MSDs. The findings of the study did not support the study done by Abate et.al (2013) and Beyen et.al (2013), who both found that smoking contributed to the development of back pain.

The study findings revealed that the amount of workload was a risk factor for MSDs, which was evidence that there was a higher prevalence of MSDs (58%) in teachers who teach 300 and above students on a daily basis compared to teachers who teach less than 100 (8%). The study also showed that teachers who spend more than 7 hours in one position when teaching have a higher prevalence rate of MSD 63% and those teachers who spend less time teaching have a lower prevalence rate (4%). The results concur with that of Durmus & Ilhanli (2012) results, who found that heavy workloads are a risk factor for shoulder, back and elbow pain among Turkish teachers. It was also revealed that prolonged

standing or sitting positions are very common in teacher's work and these mechanical factors alone, or in combination with other factors, may be responsible for musculoskeletal symptoms (Samad, 2010; Baskurt, Başkurt, & Gelecek, 2011). The results showed that all teachers use writing on the chalkboard as the only teaching method. This teaching method involves lots of repetitive upper limbs and neck movements, leading to development of MSDs especially in the shoulder region (32%). The results were consistent with the study done by Korkmaz, Cavlak, & Telci, (2011) and Yue et al., (2012) who also found that prolonged exposure to the stereotyped repetitive use of head down posture when writing lead to development of MSDs.

The results of the study showed no evidence regarding psychosocial factors as the risk factors of MSDs. The results did not support the results found by (Erick & Smith, 2011; Mesaria & Jaiswal, 2015), both studies found that psychosocial factors such as high workload/demands, high perceived stress level, low social support, low job control, low job satisfaction and monotonous work are most likely associated with MSDs.

5.4. Prevalence of MSDs

The results show a higher prevalence of MSDs (63%) amongst teachers of ward 25 Thulamela Municipality, compared to teachers with no pain. Similar results were found by Darwish et al., (2013) from their study done in Saudi Arabia, which showed MSDs prevalence rate of 79%. The results of the study results were also consistent with the results of the study done by Eric & Smith (2011) in Botswana. Ebied (2015) in Egypt also found a higher prevalence of MSDs amongst teachers ranging between 38% and 98%. The study showed different types of MSDs 32% of shoulder pain,

The results revealed that many teachers reported pain on their shoulders 32%, followed by backache 28%. Knee pain was reported by 22% of teachers; few complaints of neck 11% and hip pain 6% were also indicated. These results were consistent with other studies done by Erick & Smith, (2011) and Yue, Liu, & Li, (2012). Ceballos and Santos (2015) also found higher prevalence of MSDs in shoulder, upper back, neck and ankles and/or foot.

5.5. Management of MSDs

The results revealed that most teachers seek help from general practitioners for the management of their symptoms and 49% and 9% of teachers visited a Physiotherapist and the lowest percentages go to a clinic for management (2%). The results were also consistent with Eric and Smith's (2014), findings that a little than half (51%) of those teachers who reported MSDs had seen a nurse, doctor or physiotherapist because of pain. The study further revealed that many teachers (53%) take pain medication to relieve pain, and another group (20%) indicated that rest and medication help with pain management. 14% use physiotherapy while the other 10% revealed that rest only help to relieve their symptoms. Only 3% reported that nothing works. Yi-Shiung, Shih-Fu and Hsin-Chi (2008) and Oke and Adeyekun (2013) found similar results.

5.6. The Effects of MSDs

The results revealed that the intensity of pain increases while teaching (72%) and 18% showed that the pain stays the same, the remainder (10%) revealed that the pain is killed. About 53% of teachers presented with MSDs took sick leave while 46.84% never took any sick leave. About half (49%) took between 6-10 days of sick leave, followed by those who took between 1-5 days (31%) and few teachers (6%) took 16 days and above. The results were supported by Chen, Gupte & Akhtar, (2012). Ebied (2015) also indicated that MSDs have the highest indirect health and social care costs, which affects their work, by missing out on working days and eventually affecting the education system as a whole. The results of the study done by Erick & Smith (2014) also showed that MSDs have a negative impact on teachers jobs, because about 27% had to take time off from teaching.

5.7. Other Health Problems

The results from the present study also revealed that only 21% reported some other problems. In addition 7% of the teachers complained of respiratory problems caused by inhaling chalk powder when writing on the chalkboard, while the results of the study by Kovess-Masféty, Sevilla-Dedieu, Rios-Seidel, Nerrière, and Chan Chee (2006)) found bronchitis as the common respiratory complain among school teacher. The findings further revealed that 6% of the study population reported stress and fatigue during examination time, Ebied (2015) and Chong (2006) also found the same results. Only 5% experienced

CHAPTER 6

Conclusion, Limitation and Recommendations of the Study

6.1 Introduction

This chapter outlines the summary, conclusion and recommendations of the study. Moreover, the details of the major findings of the study are highlighted in the conclusion. Finally, the recommendations based on the findings are proposed with the hope that this will reduce the prevalence of MSDs amongst school teachers, by taking measures to prevent the occurrence of MSDs through education, controlling the risk factors associated with the development of MSDs and also improve management of MSDs.

6.2 Conclusions of the Study

The results of the current study demonstrated a high prevalence of MSDs (64%0 in the study population. The areas of the body commonly affected were the shoulders, back and knees. The study further revealed that teachers in Ward 25, Thulamela municipality have a high workload because one teacher teaches more than 300 students per day due to staff shortage. Several risks factors for MSDs in the teaching profession were identified; namely, individual factors such as age and lifestyle, work related factors such as teaching experience, number of students and teaching methods. In addition almost all the teachers in Ward 25 Thulamela municipality still use the chalkboard and chalk in the classroom. The prolonged use of the chalkboard, repetitive movements of upper limbs when writing contributed to the shoulder pain. Moreover, repetition of neck and trunk flexion when preparing lessons and marking scripts also contributed to back pain. Prolonged standing when teaching also contributed to knee pain. However the results of the study revealed that despite MSDs, 53.15 % of the teachers continue with their work and only 46.8% took sick leave.

6.3. Recommendations

Based on the conclusions reached in the study, the researcher, makes the following recommendations:

- It is advisable for school administrators, teachers and the Department of Health to work together to develop a well-organized health and safety programme to prevent MSDs among school teachers.
- It is recommended that the Department of Education should assess the workload of individual teachers, especially in the schools with acute shortage of teachers and employ more teachers.
- It is also recommended that the Department of Health should implement measures to reduce prevalence of MSDs to avoid harmful and poor impact on their personal and work productivity, by presenting health education and promotion programmes such as lifestyle changes and proper working posture.
- This study further recommends that teachers should be responsible for their own health by adopting preventive measures and coping strategies. Maintaining a healthy lifestyle in terms of physical fitness is highly recommended for the teachers.

6.4. Limitations of the Study

Because of the time limit this research was conducted in one circuit only. This could potentially limit the generalisation of the findings to all school teachers. Therefore in order to generalise the results to larger groups, the study should have involved more participants at different circuits.

6.5. Summary

School teachers were found to be vulnerable to MSDs due to the nature of their job. Individual, physical and environmental factors were found to be risk factors for MSDs. Several recommendations were suggested to curb MSDs in future.

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Limpopo Province

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Dear Sir/Madam

Request to conduct a research study

I am Maryani Niliathi Daphney, a former student of the University of Limpopo. I am currently a student of the Department of Health, Behaviour and Society, Faculty of Health Sciences, University of Limpopo. I am currently completing the requirement of my master's degree in Public Health. I am currently conducting a research project. The title of the research is "The prevalence of musculoskeletal disorders among school teachers in the Thabamole district of Limpopo Province, South Africa". The main objective of the research is to determine the prevalence of musculoskeletal disorders among school teachers. I am seeking your permission to conduct my research in your Department.

Participation in the study is entirely voluntary and you will be informed if your Department may withdraw at any time without any problem. Your participation and assistance will be highly appreciated. Should you have any queries, please do not hesitate to contact me on 0820458807 or at admmaryani@gmail.com.

Yours sincerely

Maryani N.D.

Appendix A: Request Letter to Department of Education, Vhembe district

Department of Public Health University of Venda

Private Bag X50

Thohoyandou

0950

15 September 2016

Department of Education

Limpopo Province

Vhembe district

Dear Sir/Madam

Request to conduct a research study

I am Manyani Ndiafhi Daphney, a master's student at the University of Venda. As a requirement of my master's degree in Public Health, I am requested to conduct a research project. The title of the research is "**The prevalence of musculoskeletal disorders among school teachers in the Thulamela Municipality of Limpopo Province, South Africa**". The main objective of the research project is to determine the prevalence of musculoskeletal disorders amongst schoolteachers. I would like your permission to conduct my research in your Department.

Participation in the study is entirely voluntary and any individual from your department may withdraw at any time without any prejudice. Your permission and assistance will be highly appreciated. Should you have any queries, please do not hesitate to contact me on 0820458807 or at ndmanyani@gmail.com.

Yours sincerely

Manyani N.D

Appendix B: Request Letter to Tshinane Circuit

Department of Public Health University of Venda

Private Bag X50

Thohoyandou

0950

02 November 2016

Department of Education

Vhembe district

Tshinane circuit

Dear Sir/Madam

Request to conduct a research study

I am Manyani Ndiafhi Daphney, a master's student at the University of Venda. As a requirement of my master's degree in Public Health, I am requested to conduct a research project. The title of the research is "**The prevalence of musculoskeletal disorders among school teachers in the Thulamela Municipality of Limpopo Province, South Africa**". The main objective of the research project is to determine the prevalence of musculoskeletal disorders amongst schoolteachers. I would like your permission to conduct my research in your circuit.

Participation in the study is entirely voluntary and any individual from your circuit may withdraw at any time without any prejudice. Your permission and assistance will be highly appreciated. Should you have any queries, please do not hesitate to contact me on 0820458807 or at ndmanyani@gmail.com.

Yours sincerely

Manyani N.D

ndmanyani@gmail.com

Appendix C: Information Sheet

The title of research:The prevalence of musculoskeletal disorders among school teachers in the Thulamela Municipality, Limpopo Province, South Africa.

Researcher's Name: Manyani Ndiafhi Daphney

Supervisor's Name: Prof. DU Ramathuba

Co-supervisor Name: Dr. JT Mabunda

Dear teachers

You are kindly invited to participate in this research study

The objectives of the study are:

- To determine the prevalence of musculoskeletal disorders among school teachers
- To investigate factors associated with musculoskeletal disorders
- To identify the management of MSDs
- To assess the effects of musculoskeletal disorders on school teachers

N.B: Musculoskeletal disorders are the disorders that affect muscle and bones

The study involves no foreseeable risks or harm to you and the procedure only involves the completion of a questionnaire. Participants are advised not expected to write their names on the questionnaire in order to conform to the ethical principle of anonymity. The participants will be informed that they have the right to withdraw from the study at any time.

Participation in the study is strictly voluntary. You are free to ask any question regarding the study or about being a participant by calling me at 0820458807_or e-mailing me at ndmanyani@gmail.com.

Your participation in this study is voluntary and you are under no obligation to participate.

Appendix D: Consent Form

A statement concerning participation in a research project:

The title of the study is **The prevalence of musculoskeletal disorders among school teachers in the Thulamela Municipality of Limpopo Province, South Africa.**

Name of the school _____

I have read the information on the aims and objectives of the proposed study; I was provided with the opportunity to ask questions and given adequate time to decide on the issue. The aim and objectives of the study are sufficiently clear to me. I have not been pressurised to participate in any way.

I understand that participation in this study is completely voluntary and that I may withdraw from it at any time and without supplying the reasons, and that my responses will not affect me anyhow.

3. How many children under 18 years live in your household? _____

I am fully aware that the results of this study will be used for scientific purposes and may be published. I hereby give consent to participate in this study.

Place _____ Date _____

Signature _____

5. What is your total household income per month? _____

6. How long have you been teaching? _____

7. Marital status: _____

Appendix E: Questionnaire

Section A: Demographic

Make a cross [X] next to the most appropriate answer

Name of the school.....

1. How old are you?

- Under 25
- 26-40 years
- 41-56 years
- Above 56 years

2. What is your gender?

- Male
- Female
- Other

3. How many children under 18 years live in your household?

- 1
- 2
- 3
- 4
- Other

4. What is your highest level of education?

- Certificate
- Diploma
- Bachelor ' Degree
- Masters ' Degree
- Doctoral 's Degree

5. What is your total household income per month?

- R5.000-R10.000
- R11.000-R20.000
- More than R20.000

6. How long have you been teaching?

- 0-5 years
- 6-10 years
- 11-15 years
- More than 16 years

7. Marital status

- Single
- Living with a partner
- Married
- Separated
- Divorced
- Widowed

Section B: Factors associated with musculoskeletal disorders

Make a cross [X] to the most appropriate answer

(i) Individual factors

8. How often do you exercise? Never
Once a week
When I have time
Every day
Other.....
9. Do you drink alcohol? Yes
No
Sometimes
Other
10. Do you smoke? Yes
No
Sometimes
Other

(ii)

(iii) Physical and Environmental Factors

11. Which levels are you currently teaching? Primary school
Secondary school
Other
12. How many students do you teach on a daily basis? Less than 100
101 -200
201 -300
Above 300
13. How many hours do you spend preparing student's lessons in a day? Less than 1 hour
2-3 hours
4-5 hours
More than 5 hours
14. How many hours do you spend teaching in a day? Less than 2 hours
3-4 hours
5-6 hours
6 hours and above

15. Which teaching method do you use to teach students? Writing on chalkboard
 Slides /PowerPoint
 Overhead projector
 Other.....

(iv) Psycho – social factors

16. Are you happy with your working conditions? Yes
 No

17. Are you satisfied with your salary? Yes
 No

18. Is your job stressful? Yes
 No
 Sometimes
 Other

19. Do the students listen and respect you? Yes
 No
 Sometimes
 Other

20. Do you have a good relationship with your colleagues? Yes
 No
 Sometimes
 Other

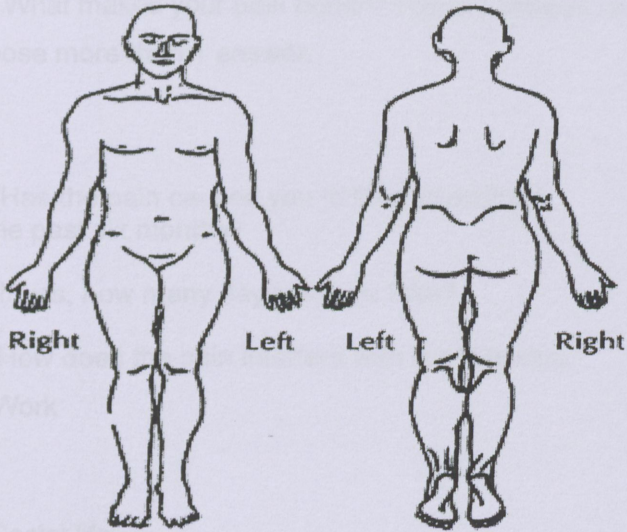
21. Do you get support from your colleagues when you need it? Yes
 No
 Sometimes
 Other

Section C: The symptoms of Musculoskeletal Disorder

Make a cross[X] in the most appropriate answer

22. Have you had pain or discomfort that lasted for 2 or more days in the following parts of the body? Yes
 No
 Other.....

If yes, make a cross [X] on the part/area of pain or discomfort in the diagram below. You are allowed to choose more than one part /area if applicable.



Section D: Effect of musculoskeletal disorders in teachers

If you answered [NO] to question number 22 go straight to question number 32.

If you answered "yes" to the question number 22, please answer the following questions.

- | | |
|--------------------------------------------|---------------------------------------------------------------------------------------------------|
| 23. How is the pain in class? | Less Same Increases |
| 24. How is the pain after class? | Less Same Increases |
| 25. How is the pain a week away from work? | Less Same Increases |
| 26. Has your pain made you seek help? | Yes No |
| 27. If yes where did you seek help? | Clinic General practitioner Physiotherapist Traditional healer Chemist Other |

28. What makes your pain better? You are allowed to choose more than 1 answer.

- Rest
- Pain medication
- Physiotherapy
- Nothing works
- Other

29. Has the pain caused you to take leave from In the past six months?

- Yes
- No

30. If yes, how many days did you take?

.....days

31. How does the pain interfere with the following:

(a) Work

- No interference
- Some interference
- Have to stop working

(b) Social life

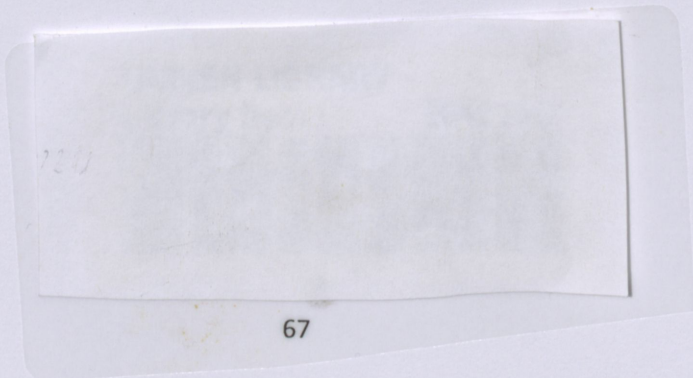
- No interference
- Some interference
- Have to stop the activity

(c)

- No interference
- Some interference
- Wakes me every night

32. Other health problems

- Yes
- If yes specify.....
- No



Appendix F: Ethical Clearance

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:
Ms ND Manyani

Student No:
11511511

PROJECT TITLE: Prevalence of Musculoskeletal disorders among school teachers in the Thulamela Municipality of Limpopo Province, South Africa.

PROJECT NO: **SHS/16/PH/17/1808**


SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

| NAME | INSTITUTION & DEPARTMENT | ROLE |
|-----------------|--------------------------|------------------------|
| Dr DU Ramalhuba | University of Venda | Supervisor |
| Mrs JT Mabunda | University of Venda | Co-Supervisor |
| Ms ND Manyani | University of Venda | Investigator - Student |

ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: August 2016

Decision by Ethical Clearance Committee Granted

Signature of Chairperson of the Committee: 

Name of the Chairperson of the Committee: Prof. G.E. Ekosse



University of Venda

PRIVATE BAG X5050, THOHoyANDOU, 09502, LIMPOPO PROVINCE, SOUTH AFRICA

TELEPHONE (015) 962 6504/8313 FAX (015) 962 9090

"A quality driven financially sustainable, rural-based Comprehensive University"

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|-----------------------------------------------------------------------------------------------------------------------------|
| UNIVERSITY OF VENDA DIRECTOR RESEARCH AND INNOVATION 2016 -08- 2 2 Private Bag X5050 Thohoyandou 0950 |
|-----------------------------------------------------------------------------------------------------------------------------|

Appendix G: Permission Letter from Vhembe District Department of Education



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
CONFIDENTIAL
EDUCATION
VHEMBE DISTRICT


REF: 14/7/R
ENG: MATIBE M.S
TEL: 015 962 1029

MANYANI NDIAFHI DAPHNEY
PRIVATE BAG X 5050
THOHOYANDOU
0950

| |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| DEPARTMENT OF EDUCATION VHEMBE DISTRICT 2016-10-24 PRIVATE BAG X 2250 SIBASA 0970 TEL: 015 962 1313/4 FAX: 015 962 6039 LIMPOPO PROVINCE |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|

PERMISSION TO CONDUCT A RESEARCH STUDY.

1. The above matter refers.
2. You are hereby informed that your request for permission to conduct research titled, *THE PREVALENCE OF MUSCULOSKELETAL DISORDERS AMONGST EDUCATORS IN THE THULAMELA MUNICIPALITY OF LIMPOPO PROVINCE*, has been granted.
3. You expected to adhere to research ethical considerations, particularly those relating to confidentiality, anonymity and informed consent of your research subjects.
4. Kindly inform circuit managers and principals of selected schools prior to commencing your data collection.
5. Wishing you the best in your study.


DISTRICT DIRECTOR

24/10/2016
DATE

PERMISSION TO CONDUCT A RESEARCH STUDY AT THULAMELA MUNICIPALITY LIMPOPO [Type text]
Page 1

Thohoyandou Government Building, Old Parliament, Block D, Private Bag X2250, SIBASA, 0970
Tel: (015) 962 1313 or (015) 962 1331, Fax: (015) 962 6039 or (015) 962 2288

Appendix H: Permission Letter from Tshinane Circuit



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA
DEPARTMENT OF
EDUCATION
TSHINANE CIRCUIT

Enq : Mulaudzi N.P
Cell : 071 675 2206
Date : 12/12/2016

TO : PRINCIPALS OF THE SELECTED SCHOOLS OF TSHINANE CIRCUIT;
TEACHERS/EDCUATORS OF THE SELECTED SCHOOL OF TSHINANE CIRCUIT

RE- REQUEST FOR CONDUCTING RESEARCH STUDY

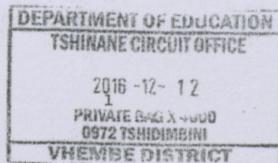
1. Attached hereto please recieve Ms ND Manyani's request and permission to conduct a research study about the specified topic.
2. The researcher will adhere to the research ethics and will in no way distrurb the normal running of the school(i.e teaching and learning)
3. We would appreciate if you could please assit her with space and milieu conducive for her reaserch.

Thanking you for your assistnace in advance in this regard


CIRCUIT MANAGER

12/12/2016
DATE

Makwarela Government Offices, Private Bag X4000, TSHIDIMBINI, 0972
Tel: (015) 963 1895 Fax: (015) 9631383



Appendix I: Letter from the Language Editor

SCHOOL OF HUMAN AND SOCIAL SCIENCES

10 May 2017

School of Health Sciences
University of Venda
Private Bag X5050
Thohoyandou
0950

Dear sir/madam

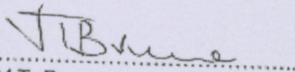
This letter serves to certify that I have proof-read Ms.N.D. Manyani's mini-dissertation, titled, "Prevalence of Musculoskeletal Disorders among School Teachers in the Thulamela Municipality in Vhembe District, South Africa".

The proof-reading entailed editing some parts of it, where I felt it would make the document more understandable; for example, to avoid wordiness, redundancy, sub-dividing long sentences into shorter ones, for clarity, etc. However, I have not tampered with the content of the mini-dissertation, except where I found that this constituted repetition or made the content confusing.

The mini-dissertation is presently ready for examination/presentation.

Thank you for your time.

Sincerely



V.T. Bvuma

Mobile: 083 423 9227



University of Venda

UNIVERSITY OF VENDA

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