Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia.

By

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DECLARATION

I, Teopolina Nakwiila Nashongo hereby declare that the work contained in the thesis entitled "Assessing risk factors and awareness of musculoskeletal disorders among operator drivers in North-western Namibia" is my own original work and that I have not previously in its entirety or in part submitted it at any university or other higher education institution for the award of a degree.

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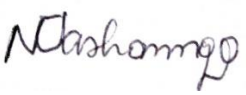
Signature:  **Date**: 15 November 2020

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DEDICATION

I dedicate this work to God Almighty for His endless care upon me. To my son, Taloshili for his patience, understanding, and being my motivation to strive for greater heights. Thank you!

ABSTRACT

Background

Operator drivers are responsible for driving trackless heavy-duty mining or construction vehicles such as graders, dumpers, loaders, and bulldozers. There are increased rates of musculoskeletal disorders (MSDs) among operator drivers due to the nature of their work, however, there is paucity of data on MSDs and associated factors among operator drivers in Namibia.

Objective

This study aimed at assessing the risk factors and awareness of MSDs among operator drivers in the construction and mining industry in Namibia.

Methods

The study adopted a descriptive cross-sectional mixed methods study. A total of 182 questionnaires were administered to operator drivers while 13 managerial staff were interviewed using a semi-structured interview guide. Quantitative data were analysed using IBM SPSS Statistics version 25 and qualitative data were analysed thematically with the aid of Atlas.ti version 8.

Results

The study results revealed that factors associated with MSDs were length of service for > 10 years (OR=15.3, 95% CI: 6.0-39.0), alcohol consumption (OR=2.8, 95% CI: 1.1-6.7), lack of physical fitness activity (OR=8.8, 95% CI: 3.8-20.4), and lack of awareness of MSDs (OR=3.1, 95% CI: 1.3-7.3). Furthermore, semi-structured interviews also revealed that 80% of the managerial staff were not aware of MSDs.

Conclusion

The study findings revealed major health issues that are associated with MSDs among the operator drivers, impacting their general wellness and productivity. Monitoring of wellness of these workers by the companies is highly recommended. There is need to increase MSD awareness, PPE usage, ergonomics skills training, and physical fitness exercises for operator drivers. Employers are urged to adopt policies, and to design guidelines and interventions aimed at promoting occupational health and safety in this population.

Key Words: Work-related musculoskeletal disorders, Operator drivers, Risk factors, Awareness, Construction, and Mining.

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Acronyms

CDC	Centre for Disease Control
EASH	European Agency for Safety and Health
LBP	Low Back Pain
MSD/Cs	Musculoskeletal Disorders/Conditions
NSA	Namibia Statistic Agency
SPSS	Statistical Package for Social Sciences
WMSDs	Work-related Musculoskeletal Disorders
WHO	World Health Organisation
YLDs	Year Lived with Disability

CHAPTER ONE

INTRODUCTION

1.1 Background information

Musculoskeletal Health is key for people's flexibility and dexterity, their ability to do work and to energetically take part in all aspects of life and to sustain economic, social, and functional independence across their life course (Briggs, Cross, Hoy, Sachez-Riera, Blyth, Woolf, & March, 2016). The Centre for Disease Control (2018), defines musculoskeletal disorders (MSDs) as injuries of the soft tissues that are caused by either unexpected or continued exposure to repetitive vibration, force, motion, and awkward positions, thereby causing disturbance of the tendons, joints, muscles, nerves, and cartilage in one's body. According to Abledu, Offei, and Abledu (2014), MSDs are signaled by carpal tunnel syndrome, sciatica, osteoarthritis, low back pain, and other idiopathic pain syndromes which result in numbness, discomfort, tingling, and swelling, leading to physical restriction.

Briggs et al. (2016) witnessed an estimated 45% increase in MSDs since 2010 as affecting millions of people globally. The World Health Organisation (2018) states that musculoskeletal conditions consist of more than 150 diagnoses that affect the locomotor system the world over, with 20-33% of people living with painful musculoskeletal conditions. According to Storheim and Zwart (2014), MSDs are the second largest contributor to disability universally, measured by year lived with disability (YLDs), with low back pain (LBP) and neck pain being the most common one but yet poorly understood conditions.

Musculoskeletal conditions/disorders are induced by the type or nature of work and the conditions of its performance, thus, referred to as work-related musculoskeletal disorders (WMSDs). According to the World Health Organisation (2018), WMSDs are major public health consternations due to the rising demands of healthcare service utilisation, temporary and permanent disability, and reduced quality of life associated with the conditions. Storheim and Zwart (2014) add that MSDs are contemporary occupational health problems representing reduced productivity, absence from work, and escalating compensation premiums.

Developing countries such as Namibia have witnessed tremendous growth in the mining and construction sectors which has created significant employment opportunities in the economy. Namibia is located in the South-West part of the African continent with a population of about 2 million and an annual growth rate of 2.18 % with a world population share of 0.03 % (Worldometer, 2018). The Namibia labour force survey indicates that the country's employed population is 712 752 persons. Plant and machine operators in the construction and mining industries constitute about 4.6% of the total employment in Namibia. From this, the construction sector contributes about 1.8% to

employment and mining and quarrying contributed 2.8%, and these are the sectors where most operator drivers are working (NSA, 2018).

Despite employment opportunities brought by the mining and construction sectors in Namibia, operator drivers are often forced to work under unusual and poor working conditions, which make them susceptible to various adverse health effects in the form of MSDs. Studies addressing MSDs involving operator drivers in the mining and construction sectors in Sub-Saharan countries like Namibia have not been undertaken. As such, information on the possible risk factors and level of awareness on MSDs among operator drivers in Namibia is limited, hence, this study sought to assess the risk factors and level of awareness on MSDs among operator drivers in construction and mining industries, North-western Namibia.

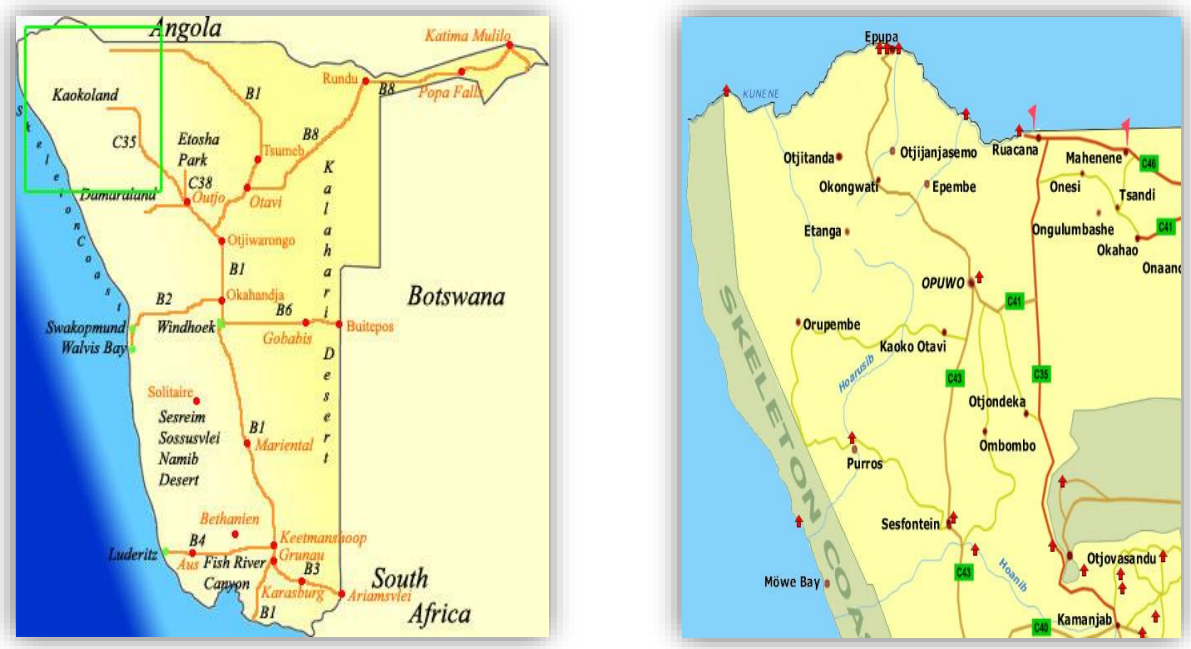


Figure 1.1: Namibian map illustrating the North-western area (Source: Adapted from "Google images" Kaokoland & Damaraland: Pictures of Namibia, Kaokland – Kunene-North west Namibia 2020. Copy right 2020 by madbookings.com)

1.2 Statement of the problem

The rates of musculoskeletal disorders that are reported are steadily increasing with operator drivers bearing the highest risk due to the nature of their work (Akinpelu, Oyewole, Odole, & Olukoya, 2011). The increasing prevalence of work-related MSDs amongst operator drivers has been termed an imminent epidemic that needs to be countered before it erupts (Boro, Andanje, & Onywera, 2013). Several cross-sectional studies indicate that more than 80% of operator drivers acknowledge substantial back pain, tendinitis, and carpal tunnel syndrome at work (Wang, Dai & Ning, 2015).

The exposure of operator drivers at work goes beyond the recommended 8 hours of work per day or they are not given enough time off to rest. This leads to a physical limitation which includes withdrawal from social and occupational activities as well as a deterioration in the operator's quality of life as a result of poor performance, absenteeism and high medical costs (Briggs et al., 2016). The situation is exacerbated by the majority of organisations that fail to seriously address the issue of MSDs, thereby creating a direct association between level of awareness, excessive hours of work and the progression of MSDs among the employees. This occupational health plight has been the norm among Namibian operator drivers who have been deprived of a safe and healthy working environment. The North-Western part of Namibia bears more mining and construction activities thus having more operator drivers susceptible to WRMSDs. However, even though there is a severity that is associated with MSDs, no studies have been done in Namibia on MSDs of operator drivers, hence the present study was aimed at operator drivers in construction and mining.

1.3 Significance of the research

Since this study is the first in Namibia, it identified knowledge gaps on MSDs and provided insights on the consequences from two perspectives (operator drivers and their employers). Thus, the study is relevant to the mining, construction and other industries that have operator drivers as the findings can help them to craft and update tailor-made WMSDs occupational policies which can effectively protect and prevent operator drivers from the adverse effects of WMSDs through the instigation of relevant OHS programmes. The study outcomes can provide the government through the Ministry of Health and Social Services and the health and safety industry with the latest information and the current status in the development of risk factors of WMSDs among Namibian operator drivers. Such current baseline information can enable the government to formulate appropriate health and safety legislation and guidelines which can effectively reduce WMSD risk factors among operator drivers in various industries. The outcomes can also stimulate the instigation of awareness initiatives (programmes) by employers to their employees and among the employees themselves, thus prompting for the establishment of preventative measures well in time before a huge population is affected by MSDs. To future researchers, this study serves as a baseline study to open more avenues and perspectives of enquiry into occupational musculoskeletal disorders.

1.4 Aims/ purpose and the objectives of the research

1.4.1 Main aim of the study

The main aim of the study was to assess the risk factors and level of awareness of musculoskeletal disorders among operator drivers in the construction and mining industries, North-western Namibia.

1.4.2 Specific objectives

The study objectives include the following: (1) To investigate the risk factors associated with WMSDs among operator drivers at work, (2) To assess the operator drivers' and their employers' level of awareness about MSDs, (3) To determine the effects of WMSDs on operator drivers and their employers, and (4) To establish possible interventions on overcoming the development of WMSDs

1.5 Research questions

The above objectives were answered using the following questions:

1. What are the risk factors of WMSDs among operator drivers?
2. Are operator drivers and their employers aware of WMSDs?
3. What are the effects of WMSDs on operator drivers and their employers?
4. Are there any interventions that can be realised to mitigate WMSDs among operators?

1.6 Chapter Summary

This chapter provided an overview and background of the problem from an international level to the Namibian context. The problem statement alluded as well as the study aim together with the objectives and the significance of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The study's theoretical framework is presented in this chapter, together with prior studies on musculoskeletal illnesses have discovered in terms of prevalence, awareness level, risk factors, effects and possible interventions.

2.2 Risk factors responsible for the development of MSDs

A study by Anyfantis and Biska (2017), indicated that there is no sole source of MSDS, but a combination of many factors working together. Taghinejad, Azadi, Suhrabi, and Sayedinia (2016) found that factors contributing to the development of MSDs fall into two main groups which are non-work-related and work-related risk factors

2.2.1 Non-work-related MSDs risk factors

These factors are not associated with work but occur due to individual characteristics and behaviours, thus they are in two categories, namely, lifestyle and demographic risk factors, as explained below (Adetiba, 2017).

2.2.1.1 Lifestyle, social and environmental risk factors

These factors are associated with individuals' way of living, social behaviours and other environmental factors which may contribute to the development of musculoskeletal disorders such as smoking, alcohol abuse and involvement in physical activities (Adetiba, 2017). Individual habits such as cigarette smoking are believed to impair and damage the structure of the musculoskeletal system by restricting/ decreasing the flow of blood in the body and subsequently the flow of oxygen in the body (Ismaila, 2010). This significant relationship between smoking and the occurrence of MSDs was confirmed by a study on risk factors of MSDs among bus and truck drivers in Iran where the high prevalence rate was found to be high among drivers who smoke (Tanui, 2016). However, Hakim and Mohsen (2017) could not establish any relationship between MSDs and smoking in their study on WMSDs and ergonomic risk factors among bus drivers. Akweetelela (2019), found out that the excessive use of alcohol leads to the suppression of the immune system, which is detrimental to the body mass and musculoskeletal system. In a study by Søgaard & Sjøgaard (2017) on the cause and cure of muscular pain by physical activity, it was revealed that the lack of physical activities has high chances of making the body to be susceptible to MSDs, especially when the body tissues are not fit. The same study also showed that physical exercises help in reducing muscular pain, help maintain other body organs' functions and

prevent lifestyle diseases (Søgaard & Sjøgaard, 2017). Therefore, individuals including operator drivers who had no physical activities in their social lifestyles were at risk of developing MSDs.

2.2.1.2 Demographic risk factors

These are factors which have to do with the socio-economic characteristics of the population/study participants such as their gender, age, weight, education level and marital status. Gender is a contributing risk factor for MSDs which is associated with hormones, strength, and muscle volume in the body. Akweetelela (2019) contends that women are three times more at risk of developing MSDs compared to man because women have less muscle strength, unlike men. However, Santos, Andrade, Lopes and Valgas's (2017) findings attributed the susceptibility of women to muscle pain as a result of their involvement in other household demands and daily chores which worsen the situation, unlike men.

Age is also a contributing factor to the development of MSDS as stressed by Sogaard and Sjogaard (2017), that as an individual age, a lot of changes happen in his/her body which makes most of the body parts to be more vulnerable to the damaging effects which can be due to a decrease in tissue elasticity. Santos et al. (2017) concur with the same concept that, the ageing process contributes greatly to MSDs development, thus, the older the worker, the more vulnerable he/she becomes to the adverse events caused by the work. Palmer and Goodson (2015) also reported that musculoskeletal complications are common in grown-up workers, and they have a major impact on their daily workability. On the other hand, Tinubu, Mbada, Oyeyemi and Fabunmi (2010) findings contradict with the latter as they realised that age and the number of years worked do not contribute to incidences of MSDs but rather decrease with age, which is attributed by the better level of knowledge about injury prevention and the development of coping strategies. In the same vein, Anyfantis and Biska (2017) in a study on physiotherapist revealed that the incidences and severity of MSDs are high through the first five years of work, which is believed to be due to lack of experience.

A study done in South Africa on the prevalence of MSDS among bus drivers revealed that the level of education plays a major role in the occurrence of MSDs, as more than 60% of the participants did not have formal education or stopped at the primary level of education (Rugbeer, Neveling, & Sandla, 2016). Thus, this is believed to have contributed to the high prevalence of MSDs among those with a low level of education due to their high level of ignorance (Rugbeer et a., 2016). This though did not concur with Hakim and Mohsen’s (2017) study as they did not find any relationship between educational level and the prevalence of MSDs. Adetiba (2017) attributes forms of MSDs such as Low Back Pain (LBP) to a combination of individual factors such as fragile back strength, high body mass index (BMI) and irregular or absence of exercises.

2.2.2 Work-related MSDs risk factors

These are factors which come about as a result of the work that one is involved in, and these factors are further divided into two main groups: psychosocial and physical risk factors (Boro et al., 2013).

2.2.2.1 Psychosocial risk factors

These affect the employee's psychological responses to their daily work and workplace conditions. These problems or conditions can be grouped into the following categories: factors related to the internal work environment or organisation such as workload, mental demand and job control. These factors are greatly influenced by the characteristic of the organisation such as financial aspects, and the relationship between employers and employees (Adetiba, 2017). Oakman, Macdonald, Bartram, Keegel and Kinsman (2018) also add job design factors such as long hours of work, work pressure and workplace environmental factors (lighting, hot or cold temperatures). Moreover, Tanui's (2016) study confirmed that factors such as the absence of breaks or nap breaks during working hours are some of the risk factors contributing to the high prevalence rate of WMSDs among the study participants, with a significant association of ($p<0.05$). Tanui (2016) further added that breaks are beneficial as they also help improve concentration and reduce the level of making mistakes during work activities. Furthermore, a study among bus drivers discovered that 83.7% of the drivers that work for more than 8 hours are greatly affected especially by Low Back Pain, while 78.5 % of those who don't get adequate rest during daily work also had a high prevalence of MSDs (Hakim & Mohsen, 2017). Widespread perceptions that finishing the job quickly is more important than the health of the person performing the task, an autocratic style of leadership at workplaces with less participation from workers at a low level and little job security also negatively contribute to MSDs development. Moreover, the growing demand to improve productivity at workplaces also contributes highly to the development of MSDs as workers will be expected to be hard at work even when the worker's ability to do the job may not match the demand for the job such as ill-structured jobs and inappropriate management programmes (Ali, Qutubuddin, Hebbal, & Kumar, 2013). The other factor is related to the external work environment such as the work that individuals do outside work, as those individuals who do a lot of household work may be more affected than those who do less.

2.2.2.2 Physical risk factors

These are factors that are related to posture and motion, and they happen when one's posture is limited or uncomfortable which causes the isometric muscle to contract. These include repetitive task movements and uncomfortable work positions (Adetiba, 2017). This concurs with a study on the assessment of WMSDs that was conducted among nurses in Kenya which indicated that 75.4% of the participant experienced WMSDs due to working in awkward and uncomfortable positions, while 73.8% of the same participants had experienced WMSDs due to performing the same task over and over

(Tanui, 2016). Anyfatis and Biska (2017) further identified factors such as continued sitting or standing in the same position, awkward postures, repetitive or forceful movements, vibration, weight handling (twisting and bending) and the use of non-ergonomic types of equipment and tools. Oakman et al. (2018) also identified the main sets of factors contributing to MSDs development and these are task and equipment factors (physical risk related to manual handling chores). Operators mostly perform their work whilst sitting, standing and some work in irregular sitting and standing positions, which results in uneasiness and exhaustion (Zein, Halim, Azis, Saptari, & Kamat, 2015). Rotating and bending of anybody part aids the movement of joints and muscles from the natural position which causes the muscles to strengthen on one side only and weakens the opposite side, which leads to pain (Adetiba, 2017). This posture will, therefore, continue causing muscle activities which will increase intramuscular pressure and thus block the flow of blood as well as the flow of oxygen to the affected body part, thereby causing muscle-related pain.

2.3 Awareness on MSDs

Zein et al. (2015) state that a lack of consciousness on ergonomic risk issues contributes highly to the development of workplace injuries. The same study by Zein et al. (20145) adds that, due to lack of awareness, most employees have developed a trend of bearing any work without understanding the stress that the kind of work may impose on their body. On the other hand, some of the employees may not notice that their bodies are under pressure until the point where they are not able to tolerate the pain. In a study conducted among Kenyan nurses, it was found that 93.1% had the main complaint that they had little information on injuries prevention techniques because the majority of them were never trained on how to practise safety measures while at the workplace (Tinui, 2016). There was a weighty association between scanty training on injury preventions and the WMSD among the study participants. Lack of knowledge on injury prevention increases the chances of nurses making faults and causing injuries (Tinui, 2016).

Also, Deros, Daruis, and Basir (2015), in a study on manual material handling also revealed that workers have a moderate level of awareness on ergonomics and manual handling. The same study further revealed that some employers do not take the danger of MSDs development seriously, as the study found that workers were only permitted to turn on the light during rainy or cloudy days which put them at a high risk of developing MSDs due to poor lighting (Deros et al., 2015). Contrary to previous studies Akinpelu et al. (2011) revealed that 52% of the Nigerian occupational drivers were aware of MSDs. Besides, these drivers also knew that it can be prevented, although some of the drivers believed that the pain they had been experiencing was caused by piles which seems to be a common belief. Qutubuddin, Hebbal, and Kumar (2013) proffer that although some workers are provided with

personal protective measures, they opt not to use them as they find them disturbing and inconveniencing.

A study conducted in Nigeria by Ismaila (2010) has shown that 3.4% of participants were aware of the concept of ergonomics. However, the learned sector and medical professionals did not fare better as only 10 (1%) and 20 (2.1%) of the respondents, respectively were aware of ergonomics. Furthermore, studies suggest that a low level of ergonomics awareness may be due to the verity that Nigerians were not familiar with the benefits that are derivable from ergonomics (Tanui, 2016). A study conducted in the banking institutions in Nairobi, Kenya by Boro, Andanje, and Onywera (2013) indicated that most employees did not know about the application of ergonomics in banking institutions. There was also a significant gender difference as women (41.32%) were more aware of the applicability of ergonomic exercises as compared to men.

2.4 The effects of MSDs on employers and employees

Bevan (2015) states that musculoskeletal disorders (MSDs) are the foremost cause of work disability, time off from work, and loss of productivity amongst all the European Union (EU) member states. Low Back Pain (LBP) is one of the most common and expensive disorder that is caused by the deviation from the upright position, which then inserts the pressure on the lumbar spine and the disc fibre layer (Adetiba, 2017). The overall cost of lost throughput due to MSDs alone is predicted to be at 2% of the gross domestic product among the working age in the EU. Health and Safety Executive (2017), indicates that about 8.9 million working days in Great Britain are lost due to WMSDs, with high prevalence rates among males aged 55 and above. International statistics indicate that two million people die every year as a result of MSDs. Zein et al. (2015), argue that MSDs has bad effects on workers such as loss of income, especially when they happen to be away from work for a long time, leading to them exhausting their medical/sick leave entitlement and they end up in using unpaid leave. This in return affects the family financially. The same study further added that the employers will be equally affected by absenteeism which will force the establishment to lose/spend more money due to lost days, low production, and the cost to train new workers as they may not be knowledgeable about the work.

A study conducted among nursing professionals corresponded with high absenteeism, as about 65.5% of the professionals who participated reported they had been absent from work in the previous year due to health reasons and among these, 42.1% of the respondents were exclusively absent due to musculoskeletal pain (Santos et al., 2017).

2.5 Interventions to overcome the development of MSDS

According to Zein et al. (2015), occupational ergonomics, administrative controls and engineering controls are some of the approaches which can be used to minimise the risk of industrial injuries. An example of engineering measures includes the use of a system /material that creates comfort while working. The use of engineering control is supported by Ahlström, Gink, Nilsson, Willstrand, and Anund, 2018) in their study on the effects of active steering systems, where it was discovered that drivers whose vehicles are designed with an active steering system were less affected as not so much physical effort is required to manoeuvre the vehicle. Ali et al. (2013) also proffer that the correct application of ergonomic measures is the best practice in enhancing workers' productivity, safety, physical and mental wellbeing as well as job fulfilment. The same study, however, stated that most workers do not make use of the measures provided as some find them irrelevant and disturbing such that they opt not to use anything and this result in MSDs cases. Anyfantis et al. (2017), on the other hand, oppose the implementation of administrative measures (work breaks and job rotations) as they argue that these may not always be achievable especially when the workload is high, and one needs to meet targets.

In overcoming the burden of MSDs, it is recommended that employers provide their workers with training on safe postures and also implement safe work practices to avoid musculoskeletal disorder diseases and injuries (Zein et al., 2015). Anyfantis et al. (2017) also discovered that some establishments have implemented well defined occupational safety and health management systems which allow workers to be inspected regularly while doing their jobs and be corrected on the spot until they are used to correct practices. Other studies also suggest that to best respond to the burden of musculoskeletal conditions, resource allocation and the functionality of the health systems and policies should be prioritised to accommodate long-term morbidity associated with MSDs. It is further recommended to strengthen occupational health and safety programmes to enhance WMSDs awareness among workers (Anyfantis & Biska, 2017).

Lifestyle involvements such as keeping a perfect body weight to avoid obesity, regular exercises, avoidance of smoking and alcohol abuse, the intake of a balanced diet and nutrients that include sufficient calcium and vitamin D, modification of the work environment and avoidance of certain repetitive activities will prevent or better the disorders ((Wang, Dai, & Ning, 2015)). Oakman et al. (2018) also recommend that in every attempt to solve the burden of MSDs, the first approach should focus on escaping the danger/risk, evaluating the risk in instances where it cannot be escaped and fighting the risk at source.

2.6 Theoretical framework

The study used the Trans-Theoretical Model (TTM) in elaborating the risk factors, awareness levels and implications of MSDs among operator drivers and the mining and construction employers in Namibia.

According to this model, individuals are unaware or ignorant of the problem or underestimate its consequences or personal applicability, hence, they consider making a change to their behaviour, often due to increased awareness or realisation of the issue (Prochaska, 2013).

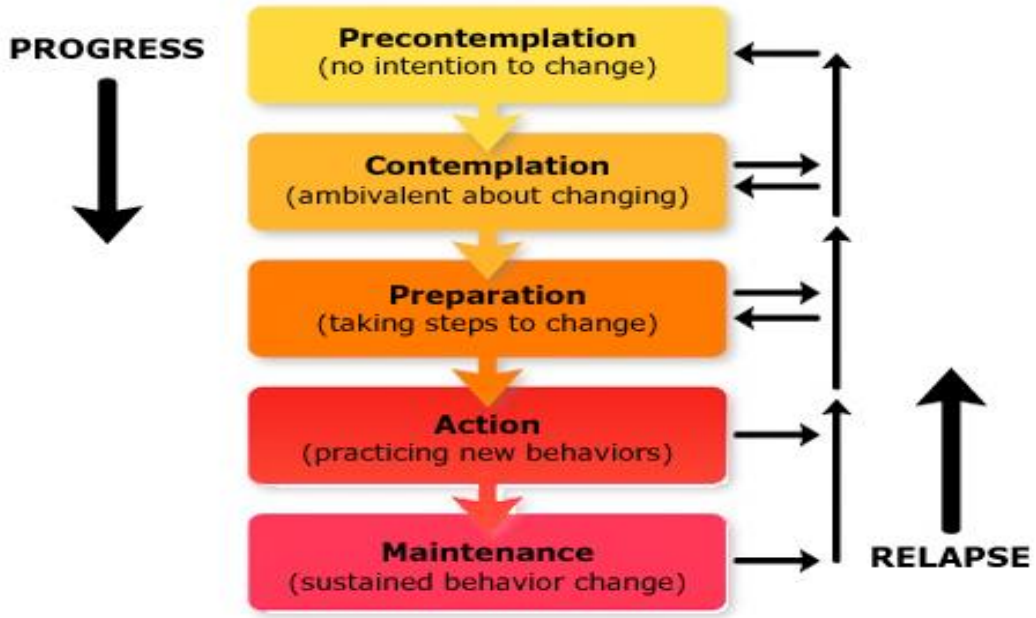


Figure 2.1: Stages of change of behaviour

(Adapted from "Tips for supporting job seekers through the stage of change" soft skill builder, 2018. Copy right 2015-2018 by softskillbuilder.com)

The first stage of this model is where an individual has no aim to change his/her behaviour and may not be aware of any need to change (pre-contemplation). The second stage is where an individual is well informed but unsure about changing (contemplation). Thereafter, the individual considers moving forward towards changing (preparation), and then one will start being committed to the new behaviours (action) and upholding such behaviours (maintenance). However, some individuals may go back to their past behaviours which are referred to as a relapse.

Similarly, in the current study, the applicability of the TTM model was premised on the fact that both operator drivers and their employers are unaware of the WMSDs risks they are subjected to at work, hence the need to sensitise them on the associated dangers. The TTM model was considered ideal in elucidating the study outcomes through education and explaining the risks they are likely facing. Individuals will, therefore, be expected to change their attitudes towards MSDs, which is through their individual or social behaviours. Thereafter, both operators and those in management will start

practising what is right to prevent MSDs in their work pace, whereby they will expect employers to start supplying their operators with all the necessary measures such as constant health education, medical check-ups, kidney belts, and time off as expected while expecting the operators to adhere to wearing their belts, change their unhealthy lifestyles and maintaining such practices. However, there may be those who will go back to their past practices of not doing anything to prevent the occurrence of MSDs which may be influenced by a lot of things such as economic downfall or just failure to adopt new changes.

2.7 Chapter summary

Literature has shown that MSDs are one of the life-threatening disorders that accounts for the death and disability of the operator driver in the construction and mining industries. Different risk factors are known, and they are classified into two main categories that are namely, work-related and non-work-related risk factors. Work-related factors are those factors which come about as a result of the work that someone carries out, for example, long hours of sitting. Non-work-related factors are those which result in MSDs but have nothing to do with the work that one does, for example, age. Lack of awareness on MSDs plays a major role as it has been noted in many studies that most participants who are not aware of MSDs tend to surfer more compared to those that are informed about MSDs. The impact of these disorders includes a high level of absenteeism and loss of quality life. The Trans-Theoretical Model (TTM) is the theoretical framework used in the study to elaborate the risk factors, awareness levels and implications of MSDs among operator drivers in mining and construction industries in Namibia.

CHAPTER THREE

METHODOLOGY

3.1. Introduction

This chapter explains the methodical approaches that were used in the implementation of the objectives of the project. The chapter, therefore, focused on the study design, study population, sampling techniques, sample size determination, data collection methods, data management and data interpretation. It also covers the study limitations and ethical issues which were considered in the study.

3.2. Study design

This study adopted a descriptive cross-sectional research design. Willmann and Seeliger (2017) describe a cross-sectional research design as the collection of data on more than one case and or place in connection with two or more variables, which are then examined to detect patterns of association. The suitability of the cross-sectional design is premised on the fact that the assessment of MSDS risk factors and awareness among operator drivers is an exact topic at a specific time and within a specified population.

The study used an explanatory sequential mixed-method approach which enabled inclusive insights into the research problem from various perspectives in reviewing a complete picture in the analysis of results. Romm and Ngulube (2015) mention that the explanatory sequential of mixed methods occurs in two distinct interactive phases. In this study, the first phase was the collection and analysis of quantitative data. The second, qualitative phase of the study was designed so that it followed the quantitative phase as shown in the diagram below (Leedy & Nimrod, 2016). The researcher collected and analysed quantitative data to identify significant predictors of the second phase (qualitative phase).

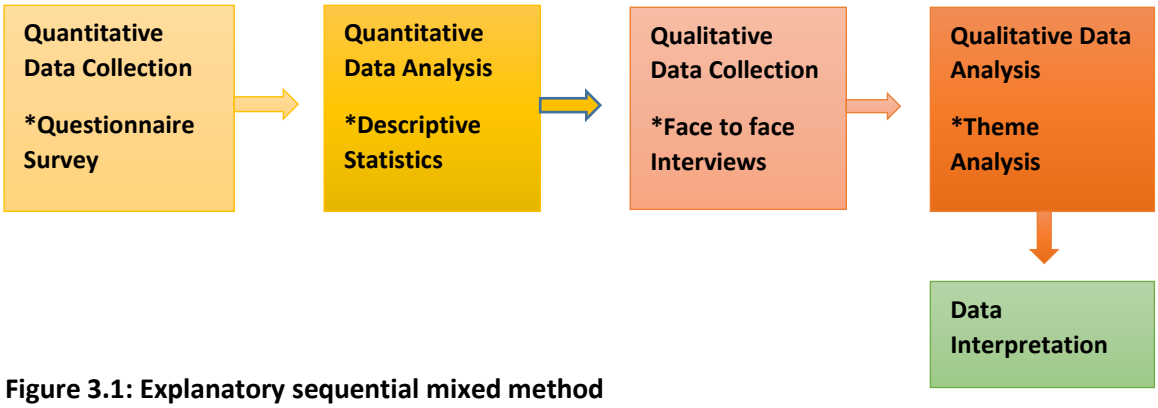


Figure 3.1: Explanatory sequential mixed method

3.2.1 Quantitative approach

Willmann and Seeliger (2017) point out that the quantitative approach focuses on social behavioural aspects which can be quantified and patterned rather than just finding out them and interpreting the meanings the people bring to their action. This approach was useful in determining the magnitude of the problem premised in MSDs causation and their association to factors. The quantitative aspect also enabled the measuring of the level of awareness among the participants thus permitting statistical analysis to be carried out. A survey strategy was employed because it allowed the collection of large amounts of data from the operator drivers (Saunders & Rojon, 2014).

3.2.2 Qualitative approach

According to Denzin (2017), the qualitative approach refers to persons' lives, lived experiences, behaviours, emotions, and feelings as well as organisational functioning, social movements and cultural phenomena. Rayaprol (2016) also states that qualitative research is used when straight descriptions of phenomena are desired to achieve deeper insights into issues under assessment. The qualitative approach successfully explored the meanings and understandings of the MSDs effects on employers and employees, which required an in-depth understanding. Qualitatively, the study followed grounded theory which aims to describe and explain research subjects. Grounded theory suitability was premised in its ability to provide an explicit clarification on WMSDs from the managerial staff through their explanations (Poilt, Dave, & Huggent, 2014).

3.3 Study population

The study population comprised of 335 operator drivers and 21 employees in managerial or senior positions from two different industrial sectors, namely the mining and construction industries. These industries have a high number of operator drivers due to the nature of the business and the day-to-day activities which are done mainly by operator drivers.

Operator drivers' daily duties include loading and off-loading goods and materials, excavating, grading and digging. They usually work for 8 hours on average during all the days of the week, but they are also entitled to off days. Most of these workers are semi-skilled as they do not have qualifications of the kind of work they do, as it is more of a license code than in-depth knowledge.

3.4 Sample size determination

For accuracy, it was important to determine the appropriate sample size of participants from the whole population of the study (Israel, 1992). The sample size was obtained as follows:

3.4.2 Managerial staff

Since the managerial staff followed the qualitative method, thirteen (13) participants out of a total of twenty-one (21) were drawn from each stratum, which means that at least two participants represented each company. Data saturation was reached with 13 participants, thus justifying the sample size. Saunders and Rojon (2014) suggest that qualitative sample sizes often may be adequate. The sample size is usually small to allow in-depth exploration and understanding of phenomena under investigation. A very large sample does not permit the deep, case-oriented analysis of qualitative inquiry.

3.4.1 Operator drivers

Operator drivers were sampled using the quantitative approach; hence the sample size was determined using Yamane's formula. The formula is versatile and widely used to calculate the sample size from a population and it is based on known sample size (Cochrane, 1973; Ugwu, Agu & Maduagwu, 2017).

Yamane's formula is denoted as follows: $n= N/(1+ Ne^2)$

Where N = study population size, e = 0.05 at 95% confidence interval

Basing on this study's population size N = 335

Sample size: $n= 335 / (1 + 335 (0.05^2) = 182.3$

Therefore, the sample size for the study was 182

3.5 Sampling techniques

The following sampling techniques were used to select the study participants.

3.5.1 Random stratified sampling

The random stratified sampling technique was used to choose operator drivers from their diverse working institutions. Stratified sampling involves the establishment of strata from populations with mixed characteristics which will be divided into subgroups to ensure that every characteristic is proportionally represented in the sample (Romm & Ngulube, 2015).

Firstly, the sample of the total population was stratified based on each of the mine or construction companies. The following formula was used to get a proportion of each stratum: $\mathbf{Nx} = \frac{\mathbf{n(P)}}{\mathbf{N}}$, Where Nx is the sample size in each level, n = total sample size of the study, P = population size of the staff in each stratum, N = total population of the study as shown in the table below. Secondly, from each stratum, a simple random sampling technique was used to draw the participants. All individuals within a stratum were assigned a number. A computer was used to generate numbers at random and if the

generated number corresponded to an individual, then automatically he or she was included in the study. The table below shows how each stratum was portioned.

Table 3.1: Stratified sampling by mine and construction companies

Company strata	Type of Business	Population size	Percentage population	Sample size in each stratum
VW construction PTY LTD	Construction	37	11%	20
China Jiangsu International (Namibia) LTD	Construction	51	15%	28
Kabwa Trading CC	Construction	51	15%	28
Telekop Project	Mining	44	13%	24
Kunene Stone Quarrying CC.	Mining	63	19%	34
Okongoro Development	Mining	89	27%	48
Total		335	100%	182

3.5.2 Purposive sampling

This non-probability sampling technique was also used to select participants in managerial and senior positions who work in close contact with the operators. The purposive sampling technique occurs when the researcher relies on his or her judgment in choosing participants. This involves identifying and selecting individuals or groups of individuals that are especially knowledgeable about or experienced in a phenomenon of interest (Magwa & Magwa, 2015).

3.6 Data collection methods

Data collection is the process whereby a variable of interest's information is gathered and measured in a way that will help the researcher to achieve the stated objectives and to assess the outcomes (Creswell & Garrett, 2008). The study adopted two data collection methods which are as follows:

3.6.1 Questionnaire method

Self-administered questionnaires with closed-ended questions were used to collect data from operator drivers. Questionnaires are a set of questions that are arranged in a sequence that is used to collect specific data (Denzin, 2017). The questionnaire was developed through literature exploration as well as by aligning the questions to the research objectives. The questionnaire method allowed participants to express themselves comfortably. Questionnaires are private and confidential, they are practical and can gather large amounts of information from a large number of people in a short period and in a relatively cost-effective way (Patton, 2015; Leedy & Nimrod, 2015). The questionnaire contained Section A which collected information on demographics, Section B collected information on workplace conducts and Section C for information about awareness of musculoskeletal disorders.

3.6.2 Interview sessions

The interviews were conducted with the management or those at the supervisory level at their workplaces and this was done during their lunch hour. On arrival, introductions were made, which was followed by an informed consent which sought permission from the respondents. Upon the respondents' consent, the interview was held using an interview guide with open-ended questions (see Annexure C). The guide contained questions on the demographics, organisational practices and the effects of MSDs. The researcher recorded the data in English for easy coding and transcription. An audio recorder was also used to record data from the participants during each session upon the participants' consensus. The use of open-ended questions enabled the research to get some hidden information that was not provided by the interview guide but was relevant to the study (Onwuegbuzie & Johnson, 2010). Environmental utterances were checked to ensure a suitable environment free from disturbances to enable maximum concentration.

3.7 Pilot study

A pilot study of the questionnaire was done with eight (8) operator drivers of Oshakati Town Council because they do the same daily activities as operators in the mining and construction industries. An interview guide pilot was carried out with two (2) supervisors of the operator drivers at the same town council. The outcome of the pilot study revealed that the study was feasible to be carried out on a large scale. The study procedures for data collection met some primary problems, with the questionnaire having some invasive and monotonous questions. There was also a problem of motivating the respondents to participate in the study as the participants seemed not too happy with the questionnaire. Self-administered questionnaires also had the problem of some participants not understanding some questions hence they needed these to be clarified for them to respond well. The researcher had to stay close to several participants when they were completing the questionnaire so that she could respond to the participants' concerns. Moreover, some of the participants were not willing to participate, thus forcing the researcher to look for other willing participants. The pilot study provided the researcher with an inimitable opportunity to make improvements on the structuring and wording of the questions, participant approach skills and selecting a conducive environment for administering the questionnaire. The pilot study enabled the strategising of solutions to problems thus paving the way for a successful data collection process and the ultimate research.

3.8 Data management

3.8.1 Quantitative data

Quantitative data were analysed using IBM SPSS (Statistical Package for Social Sciences), Statistics version 25 and Microsoft Excel 2010. The data were screened, cleaned and coded before the analysis was done. Descriptive statistics were run to present basic features of the study sample in the form of

frequencies, percentages, means and standard deviations. Workplace practices and musculoskeletal disorders awareness levels among the operator drivers were presented as proportions and the Chi-square test of association was used to compare the proportions across the participants' socio-demographic profiles. Binary logistic regression modelling was conducted to examine the risk factors for MSDs. This procedure involved initial invariable analysis to select the covariates to be included in the final multivariable model. A less strict significance level of $p<0.20$ was set for the initial invariable modelling to avoid excluding factors that could be associated with MSDs. The Hosmer and Lemeshow test ascertained if the model fitted the data well and the influence of the significant predictors was reported as odds ratios for MSDs (Ismaila, 2010).

3.8.2 Qualitative data

Qualitative data were analysed thematically where the analysis entailed searching, coding, mapping and describing patterns, themes and categories in the data. Themes are patterns across data sets that are important to the description of a phenomenon; hence the themes became the categories for analysis. The researcher followed the process of coding in six phases in thematic analysis. Firstly, the researcher familiarised herself with the data by reading the scripts and listening to the audio recorder. This was followed by the generation of codes through searching for keywords/phrases relevant from the research objectives and questions, then coding them (with the same colour) with corresponding ideas and behaviours in the transcripts and other notes. Subsequently, common codes were searched, examined and organised into themes. This was followed by scrutinising the themes against the dataset to determine if the data results were resounding and if the results convincingly answered the research question. The final steps involved the defining and naming of the themes as well as producing the final report (Cooper & Schindler, 2014). Common themes found were in line awareness and the effects of WMSDs. This was done with the aid of Atlas.ti version 8, a qualitative analysis program that facilitates the creation and assignment of codes to text. The descriptive statistics on the demographic profiles were run using IBM SPSS version 25.

3.9 Data interpretation

The participant's demographics information was matched against the occurrence of MSDs, the level of awareness as compared to the number of years worked and the occurrence of MSDs. The risk factors were compared to the age of the participant and the number of years worked. The data on the effects of MSDs to the employers and employees were classified either as negative or positive and extent of the effect.

3.10 Study limitations

The mining companies which were initially targeted for data collection could not permit for the study to be conducted in their establishment due to the change in company policy. However, other companies in North-western Namibia within the mining sector and construction industry were approached and permission to research with them was given.

3.11 Ethical considerations

During the study, the researcher adhered to the following ethical standards:

- Ethical approval was sought from the Faculty of Health and Applied Science as well as from the Ministry of Health and Social Services;
- Permissions were obtained from the management of the 6 companies which granted permission for the research to be conducted within their establishments;
- A signed written consent form was obtained from each participant before collecting data;
- The participants were informed that they were free to withdraw from the study at any time; and
- The researcher protected the participants from harm by ensuring anonymity and confidentiality and the collected data was securely stored within lockable locations and a computerised record was secured with a security code.

3.12 Chapter summary

A descriptive cross-sectional study was conducted. The study used both the quantitative and qualitative approaches, and the mixed methods resulted in a comprehensive look at the research problem from many perspectives and this helped to offer a more complete picture when analysing results. Self-administered and interviewer-administered questionnaires were used to collect quantitative data while qualitative data were collected using an interview guide. Quantitative data were analysed using SPSS version 25 and Microsoft Excel 2010 and qualitative data were analysed with the help of Atlas.ti version 8. Research ethics were applied throughout the study.

CHAPTER FOUR

FINDINGS

4.1 Introduction

This chapter presents the outcomes of the study. The first section presents the socio-demographic data of the participants, participants' social habits and work conditions or practices and the participants' level of awareness on MSDs. The second section presents the research findings on the effects of MSDs on organisational performance and lastly the interventions in overcoming the burden of MSDs. Results generated from the quantitative approach are illustrated in tables and figures while those from the qualitative investigation are interpreted in themes and the underlying meanings are explained.

Section A: Quantitative results

4.2 Participants demographics

In the study, a total of 182 questionnaires were distributed among operator drivers and all were returned, thus giving a 100% response rate. A total of 20 questionnaires were distributed to Construction Company (CC) 1, 28 questionnaires to CC2 and again 28 questionnaires to CC3. A total of 24 questionnaires were distributed to Mining Company (MC)4, 34 questionnaires to MC5 and 48 questionnaires to MC6. The participants' characteristics are summarised in Table 4.1 below.

All the 182 operator drivers were male, and this is due to the nature of the work of operator drivers and there was an almost equal split between single (51%) and married (49%) participants. Up to 9% of the participants had no formal education while 38% only had primary school education, whereas 41% had secondary school education and 12% had tertiary level education.

Table 4.1: Participants demographic profile

Category	Frequency	Percentage
Gender		
Male	182	100%
Marital status		
Single	92	51%
Married	90	49%
Education		
None	16	9%
Primary	69	38%
Secondary	75	41%
Tertiary	22	12%

CC2 constituted the highest percentage (25%) of operators without any formal education and none with tertiary education. CC2 and MC4 both had all their operators with some formal educational background. CC1 had the highest score of 29% of their operators with tertiary qualifications.

Table 4.2: Participants level of education per companies

		Company						Total
		CC1	**CC2**	**CC3**	**MC4**	**MC 5**	**MC 6**	
Level of education	Primary	6(32%)	13(46%)	7(25%)	9(38%)	12(35%)	29(60%)	76(42%)
	Secondary	5(25%)	9(33%)	14(50%)	14(59%)	18(52%)	2(5%)	62(34%)
	Tertiary	5(29%)	6(21%)	-	1(3%)	3(10%)	7(15%)	22(12%)
	None	4(14%)	-	7(25%)	-	1(2%)	10(20%)	22(12%)
Total		20(100%)	28(100%)	28(100%)	24(100%)	34(100%)	48(100%)	182(100%)

4.2.1 Age distribution of respondents

The age of the operator drivers ranged from 24 to 63 years with the majority at 40 (22%) aged between 24-30 years and the least participants at 8(4%) aged 55 years and above.

Table 4.3: Participants' age (n=182)

Age bracket in years	**Frequency**	**Percentage**
24-30 years	40	22%
31-35 years	33	18%
36-40 years	31	17%
41-45 years	24	13%
46-50 years	15	8%
51-55 years	31	17%
55+ years	8	4%
Total	182	100%

4.2.2 Number of years worked as an operator driver

The number of years as operator drivers ranged from just 1 year to 30 years, with the majority of the 62(34%) respondents have served for 1-5 years and the highest length of service ranging from 20-30 years had 7(4%) participants.

Table 4.4: Participants' working experience (n=182)

Length of Service	Frequency	Percentage
1-5 years	62	34%
6-10 years	52	29%
11-15 year	28	15%
16-20 years	16	9%
21-25 years	17	9%
26-30 years	7	4%
Total	182	100%

More than half as represented by 16 (57%) respondents of CC's operators that had worked for more than 10 years, while CC1 had the least (7) (36%) of operators who had worked for more than 10 years and vice versa in terms of those who had worked for less than 10 years. More than half (100) (56%) of the operators had worked for less than 10 years and 81(44%) had worked for more than 10 years.

Table 4.5: Participants' working experience per company

		Company						Total
		CC1	CC2	CC3	MC4	MC 5	MC 6	
Years as a driver	Less than 10 years	13(64%)	15(54%)	12(43%)	14(59%)	20(58%)	27(55%)	101(56%)
	10 years or more	7(36%)	13(46%)	16(57%)	10(41%)	14(42%)	21(45%)	81(44%)
Total		20(100%)	28(100%)	28(100%)	24(100%)	34(100%)	48(100%)	182(100%)

4.3 Participants social habits

4.3.1 Smoking habits

More than half (108) (59%) of the operator drivers did not smoke, whereas 74 (41%) were smokers.

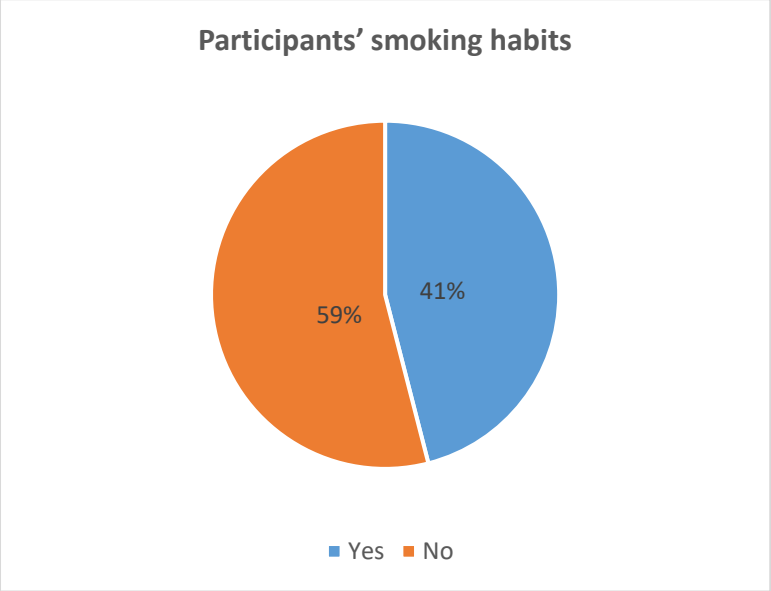


Figure 4.1: Participants' smoking habits (n=182)

Comparisons were also made to see the participants' smoking habits in different companies as illustrated below. The majority of operators who smoked were from MC5 with 20(58%), while MC6 had the least number (10) (30%) of operators who smoke.

Table 4.6: Participants' smoking habits per company

		Company						Total
		CC1	**CC2**	**CC3**	**MC4**	**MC 5**	**MC 6**	
Do you smoke?	Yes	9(46%)	14(50%)	10(36%)	11(44%)	20(58%)	10(30%)	74(41%)
	No	11(54%)	14(50%)	18(64%)	13(56%)	14(42%)	38(70%)	108(59%)
Total		20(100%)	28(100%)	28(100%)	24(100%)	34(100%)	48(100%)	182(100%)

4.3.2 Alcohol consumption

The results in Figure 4.3 show that 124 ODs, representing about two thirds (68%) of the participants consumed alcohol and the other third (58) (34%) did not.

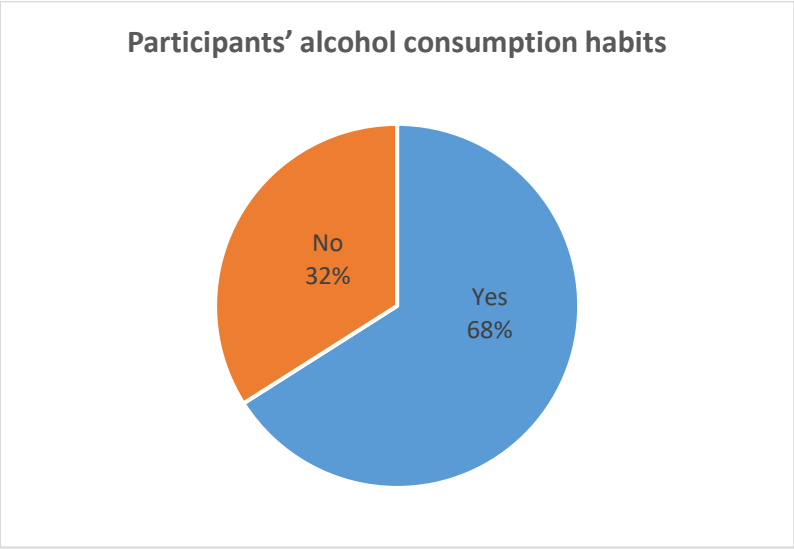


Figure 4.2: Participants' alcohol consumption habits (n=182)

CC1 and CC3 both had the highest score of 22(79%) of their operators who consume alcohol and CC2 with the least score of 16(58%).

Table 4.7: Participants' alcohol consumption habits per company

		Company						Total
		CC1	**CC2**	**CC3**	**MC4**	**MC 5**	**MC 6**	
Do you consume alcohol?	Yes	16(79%)	16(58%)	22(79%)	14(59%)	20(58%)	36(75%)	124(68%)
	No	4(21%)	12(42%)	6(21%)	10(41%)	14(42%)	12(25%)	58(32%)
Total		20(100%)	28(100%)	28(100%)	24(100%)	34(100%)	48(100%)	182(100%)

4.3.3 Physical activities

The majority (92) (51%) of the operator drivers took part in fitness and recreational activities and 90(49%) did not do so.

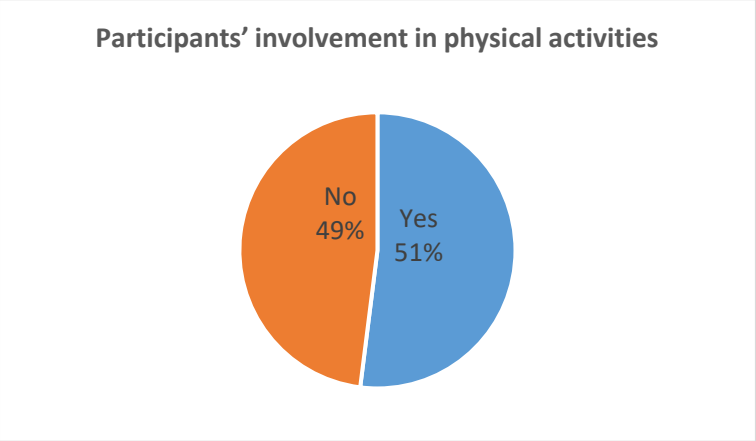


Figure 4.3: Participants' involvement in physical activities (n=182)

Table 4.8 below shows that 23(67%) of the respondents in MC5 are smokers whilst MC4 had at least 8(35%) operators who were active smokers

Table 4.8: Participants' involvement in physical activities per company

		Company						Total
		CC1	CC2	CC3	MC4	MC 5	MC 6	
Do you get time to do any physical activities such as fitness or recreational activities	Yes	11(57%)	14(50%)	15(54%)	8(35%)	23(67%)	19(40%)	90(49%)
	No	9(43%)	14(50%)	13(46%)	16(65%)	11(33%)	29(60%)	92(51%)
Total		20(100%)	28(100%)	28(100%)	24(100%)	34(100%)	48(100%)	182(100%)

4.3.3.1 Physical activities by type

Out of the operator drivers who took part in fitness and recreational activities, 34(36%) did some running, 16(17%) walked,14(15%) played soccer and only 7(8%) went to the gym.

Table 4.9: Types of physical activities participants are involved in (n=95)

Activity	Frequency	Per cent
Running	35	37%
Walking	16	17%
Play soccer	14	15%
Do set-ups	12	13%
Do push-ups	11	11%
Gym	7	7%
Total	95	100%

4.4 Workplaces Conditions

4.4.1 Workplace practices

Almost all 176 (97%) of the operator drivers went through episodes of prolonged sitting. Virtually all 174 (96%) of the operator drivers were exposed to vibrations. About 6 in 10 (59%) of the operator drivers engaged in sitting with a rounded back or with shoulders slumped forward, while 41% did not engage in this type of sitting. Only 2% of the participants did not engage in repetitive neck and wrist movements and the rest (98%) did so. About half (51%) of the operator drivers engaged in positions that strained body parts for a prolonged time while the other (49%) did not do so and only 23% of the operator drivers worked in confined spaces and 77% did not work in confined spaces.

Table 4.10: Results of workplace MSDs risks exposure of participants (n=182)

Work Practice	Frequency	Percentage
Prolonged sitting		
Yes	176	97%
No	6	3%
Exposure to vibration		
Yes	174	96%
No	8	4%
Sitting with back rounded or shoulder slumped forward		
Yes	107	59%
No	75	41%
Make repetitive movements with neck and wrist		
Yes	178	98%
No	4	2%
Holding any of the body parts in a straining position for a prolonged time		
Yes	92	51%
No	87	48%
Working in a confined space		
Yes	41	23%
No	141	77%

4.4.1.1 Other workplace practices

Participants indicated additional exposure to working conditions and practices that may potentially lead to the development of MSDs. The majority of the participants (50), representing about 27%, indicated that they are overloaded with work, 43(24%) said that they work under a hot environment, and 21 (12%) indicated that they are working with old model machines. The rest at below 10%, includes repetitive work, the use of uncomfortable machines and machines with mechanical problems.

Table 4.11: Other workplace practices participants are involved in (n=182)

Work practices/conditions	Frequency	Percentage
Work overload	50	27%
Hot-working environment	43	24%
Working with old model machines	21	12%

Doing repetitive work	11	6%
Working with uncomfortable machines	10	5%
A mechanical problem with machines	9	5%
None	38	21%
Total	182	100%

CC3 had half (50%) of their participants being involved in high work overload, while the rest of the companies had experienced less than 40% of involvement in the below-mentioned practices.

Table 4.12: Results of other workplace practices in which participants were involved in per company

Workplace practices	Company						Total
	CC1	CC2	CC3	MC4	MC 5	MC 6	
Repetitive work		13%			13%	10%	6%
Hot-working environment	11%	29%	21%	32%	23%	25%	24%
Mechanical problem with machines	7%	4%	-	-	6%	15%	5%
None	32%	29%	11%	21%	17%	20%	21%
Work overload	25%	4%	50%	32%	25%	25%	27%
Working with old model machines	7%	17%	14%	9%	15%	5%	12%
Working with uncomfortable machines	18%	4%	4%	6%	2%	-	5%
Total	100%	100%	100%	100%	100%	100%	100%

4.4.2 Number of hours participants work per day

The majority (95) (60%) of the operator drivers worked 8-hour shifts while 77(35%) worked for 9 hours and 10 (5%) for 10 hours or more.

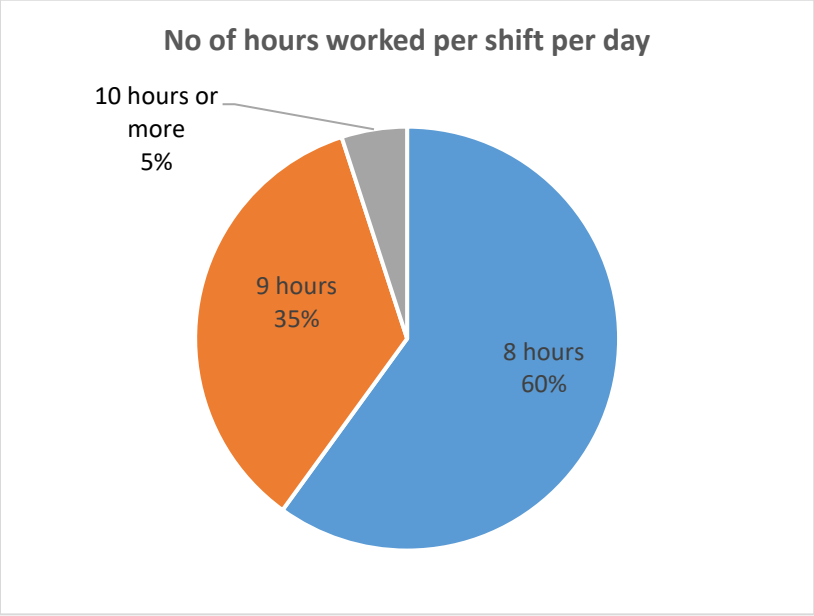


Figure 4.4: No of hours worked per shift per day

CC2 and MC5 are the only companies where all their operator drivers work for 8 hours per day, MC4 operators all work for 9 hours and other companies' operators work for different hours with some working for more than 10 hours a day.

Table 4.13: Results of the total number of working hours of participants per shift in a day

		Company						Total
		CC1	CC2	CC3	MC4	MC 5	MC 6	
How many hours do you work per shift per day	8 hours	17(86%)	28(100%)	11(39%)		34(100%)	5(10%)	95(60%)
	9 hours	3(14%)		7(25%)	24(100%)		43(90%)	77(35%)
	10 hours or more	-	-	10(36%)	-	-	-	10(5%)
Total		20(100%)	28(100%)	28(100%)	24(100%)	34(100%)	48(100%)	182(100%)

4.4.3 Time to rest during working hours (break)

A total of 45 (25%) of the operator drivers were not given any time to rest within working hours.

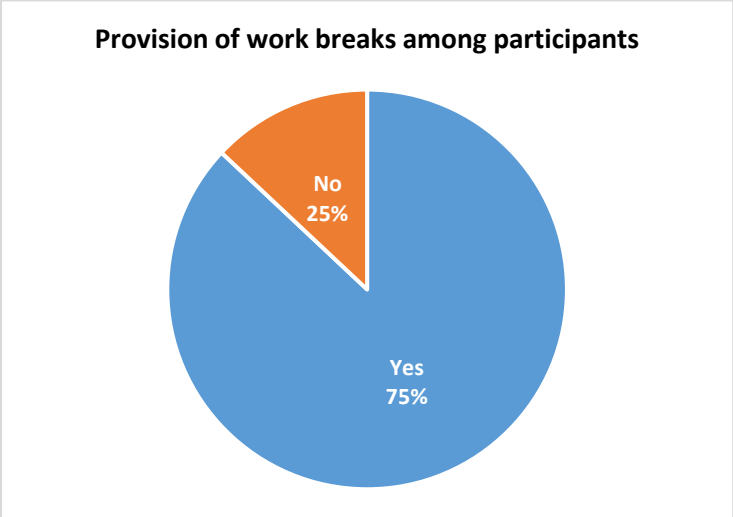


Figure 4.5: Provision of work breaks among participants (n=182)

The results in the table below indicate that four (4) out of six (6) companies make 100% provisions for their employees to get time to rest/ break during work, whereas 80% of the operators in company six do not get time to rest when at work.

Table 4.14: Provision of work breaks per company

		Company						Total
		CC1	CC2	CC3	MC4	MC 5	MC 6	
Are you given time to rest within working hours(break)?	Yes	20(100%)	28(100%)	21(75%)	24(100%)	34(100%)	10(20%)	137(75%)
	No	-	-	7(25%)	-	-	38(80%)	45(25%)
Total		20(100%)	28(100%)	28(100%)	24(100%)	34(100%)	48(100%)	182(100%)

Among the operator drivers that were given time to rest within working hours, 4% were given 30 minutes, 87% were given an hour and 9% were given 2 hours' rest.

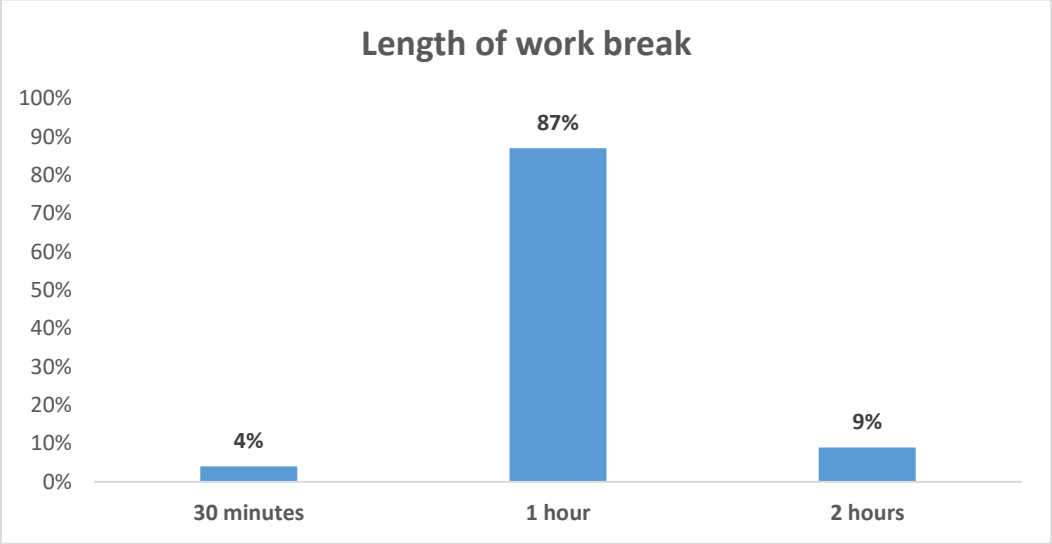


Figure 4.6: Length of work break (n=159)

Out of the six (6) companies, three (3) companies give all their operators a 1-hour break, while the other three remaining companies give their employees different durations of breaks, some having 2 hours and the others 1 hour and 30 minutes.

Table 4.15: Length of work breaks per company

		Company						Total
		CC1	CC2	CC3	MC4	MC 5	MC 6	
If yes how long	1 hour	10(50%)	28(100%)	24(86%)	24(100%)	34(100%)	12(25%)	132(73%)
	2 hours	10(50%)	-	-	-	-	-	10(5%)
	30 minutes	-	-	4(14%)	-	-	36(75%)	40(22%)
Total		20(100%)	28(100%)	28(100%)	24(100%)	34(100%)	48(100%)	182(100%)

4.4.4 Days off during the working week

All 182 (100%) of the operator drivers were given off days to rest and for most (65%) this was during Sundays. Only 15% were given both Saturday and Sunday to rest.

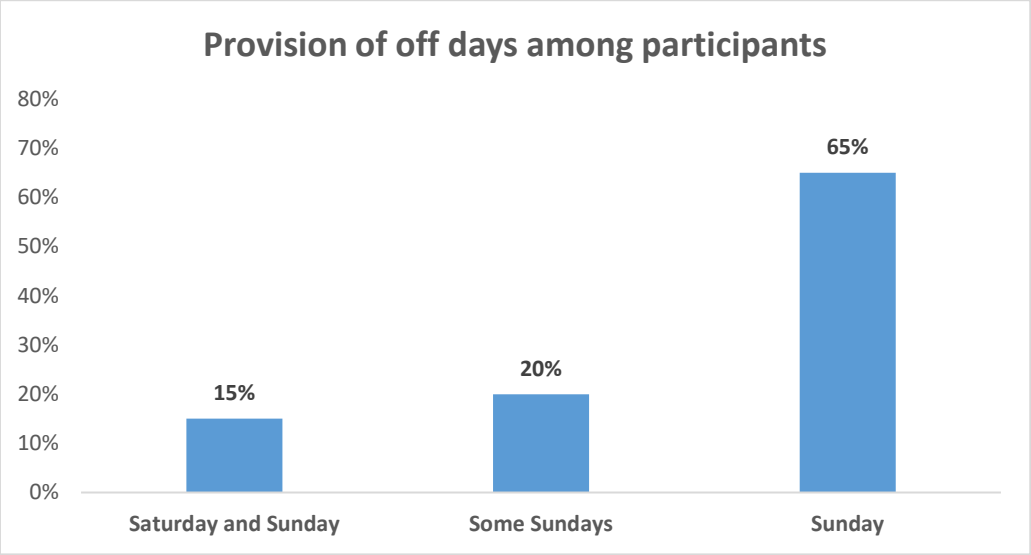


Figure 4.7: Provision of off days among participants (n=182)

Besides all the companies making provisions to give their operators off days, only company two gives most of their drivers (96%) Saturday and Sunday off compared to other companies which only give their operators one day off.

Table 4.16: Provision of off-days per companies

		Company						Total
		CC1	CC2	CC3	MC4	MC 5	MC 6	
If yes, how many days	Saturday and Sunday	3(14%)	27(96%)	-	-	-	-	30(16%)
	Some Sundays	10(50%)	-	12(43%)	-	7(21%)	-	29(16%)
	Sunday	7(36%)	1(4%)	16(57%)	24(100%)	27(79%)	48(100%)	123(68%)
Total		20(100%)	28(100%)	28(100%)	24(100%)	34(100%)	48(100%)	182(100%)

4.5 The effects of MSDs on employers and employees

4.5.1 Driving fatigue/stress

A total of 113 (62%) of the operator drivers experienced driving fatigue while 69(38%) did not experience any driving fatigue or stress. Findings per company indicate that 20(85%) of operators from

MC4 greatly experience driving discomfort, followed by 23(69%) from MC5 and CC2 has operators who do not experience much of the discomfort as represented by 9(33%) of the respondents.

Table 4.17: Driving fatigue/stress experienced by ODs per companies

		Company						Total
		CC1	CC2	CC3	MC4	MC 5	MC 6	
Driving fatigue/stress	Yes	12(61%)	9(33%)	18(64%)	20(85%)	23(69%)	31(65%)	113(62%)
	No	8(39%)	19(67%)	10(36%)	4(15%)	11(31%)	17(35%)	69(38%)
Total		20(100%)	28(100%)	28(100%)	24(100%)	34(100%)	48(100%)	182(100%)

4.5.2 Discomfort experienced by a participant in their daily activities

Certain discomforts such as driving fatigue, pain from various parts of the body and headaches are associated with the nature of the work by the ODs. Results obtained revealed that three-quarters (137) of the operator drivers had experienced discomfort in the daily activities and the remaining 25% (45) did not.

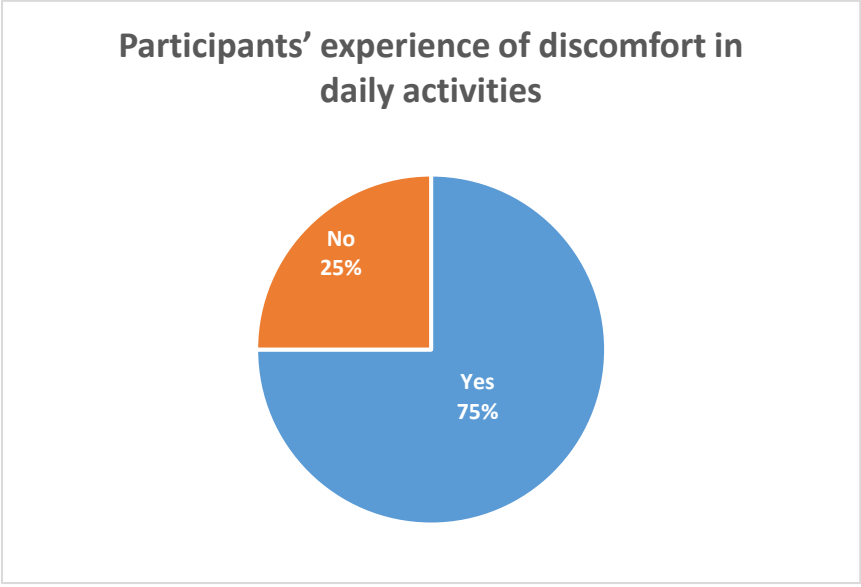


Figure 4.8: Participants' experience of discomfort in daily activities (n=182)

Out of the three-quarters of operator drivers who experienced discomfort in their daily activities, 45% experienced neck pain, 16% experienced body pains and 15% felt tiredness. A variety and combination of other forms of discomfort were reported as shown in the table below.

Table 4.18: Nature of discomfort experienced (n=134)

Nature of Discomfort	Frequency	Per cent
Body pain	22	16%
Tiredness	20	15%
Back pain and headache	12	9%
Tired sometimes	10	8%
Eye pain and back pain	9	7%
Tiredness and back pain	9	7%
Headache and eye pain	8	6%
Neck and back pain	8	6%
Shoulder and neck pain	7	6%
Back pain	6	4%
Neck pain	6	4%
Shoulder pain	6	4%
Neck and eye pain	5	4%
Eye pain	2	1%
Headache	2	1%
Shoulder and back pain	1	1%
Tiredness and headache	1	1%
Total	134	100%

Body pain and tiredness are the most common kinds of discomfort experienced by operators in all the companies as indicated below.

Table 4.19: Nature of discomfort experienced per company

		Company						Total
		CC1	CC2	CC3	MC4	MC 5	MC 6	
If yes, what kind of discomfort	Back pain	-	-	6%	-	11%	6%	4%
	Back pain and headache	22%	7%	-	8%	11%	-	10%
	Body pain	9%	14%	26%	14%	21%	6%	16%
	Eye pain	-	7%	-	4%	-	-	1%
	Eye pain and back pain	13%	14%	6%	8%	3%	-	7%
	Headache	-	-	-	-	6%	-	1%
	Headache and eye pain	4%	-	-	8%	6%	16%	6%
	Neck and back pain	4%	-	-	4%	14%	6%	6%
	Neck and eye pain	4%	-	-	12%	-	6%	4%
	Neck pain	9%	7%	-	8%	-	6%	4%
	None	-	-	6%	-	-	-	1%
	Shoulder and back pain	-	-	6%	-	-	-	1%
	Shoulder and neck pain	-	-	6%	12%	-	16%	5%
	Shoulder pain	-	-	17%	-	6%	6%	4%
	Tired sometimes	-	-	-	18%	8%	10%	7%

	Tiredness	26%	44%	10%	4%	8%	10%	15%
	Tiredness and back pain	9%	7%	17%	-	6%	6%	7%
	Tiredness and headache	-	-	-	-	-	6%	1%
Total		100%	100%	100%	100%	100%	100%	100%

4.5.3 What participants do to relieve themselves from the discomfort

Among the operator drivers who experienced discomfort in their daily activities, 23(17%) took pain killers, 20(15%) opted to rest and another 20(15%) massaged themselves with an ointment to relieve the discomfort.

Table 4.20: Results of modes through which participants (n = 135) relieve themselves (body breaks)

Methods of relief	Frequency	Per cent
Take pain killers	23	17%
Massage with ointment	20	15%
Resting	20	15%
Nothing will disappear on its own	13	10%
Go to hospital	11	8%
Take a shower	9	7%
Drink water	8	6%
Take pain killers and drink a lot of water	6	4%
Use eye ointment and take pain killers	6	4%
Take a shower and resting	5	4%
Take a shower and take pain killers	5	4%
Take pain killers and resting	4	3%
Stretching	3	2%
Use eye ointment	2	1%
Total	135	100%

4.6 Awareness level of MSDs

4.6.1 a. Operators' awareness levels about MSDs

About 3 in 10 (29%) of the operator drivers knew about MSDs and the majority (7) (71%) were not aware of the condition.

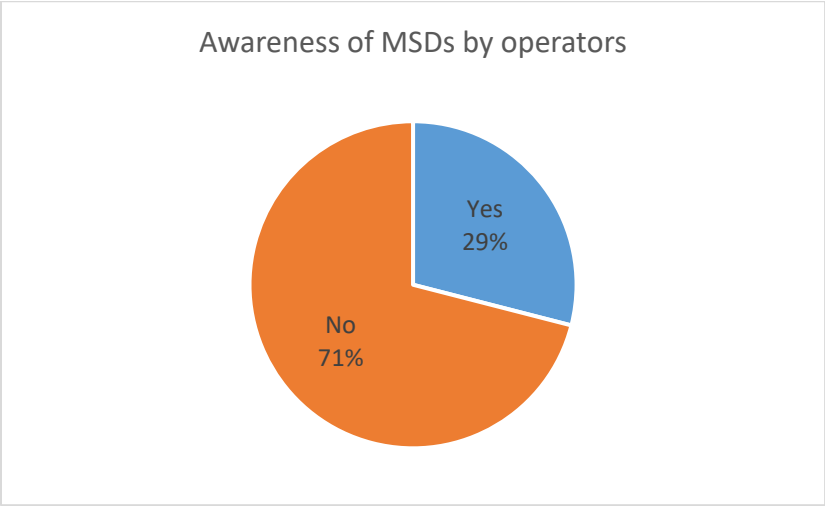


Figure 4.9: Awareness of MSDs by operators (n=182)

4.6.2 b. Effects of MSDs on health

Among the 52 operator drivers who knew about MSDs, 79% also knew about the effects of MSDs on their health, while 21% were not aware. Kidney damage (12%) was mentioned as the highest, followed by making the body weak as mentioned a significant number of operator drivers, while several other effects were mentioned as shown below:

Table 21: Results of known MSDs effects on health (n=41)

Effects of MSDs	**Frequency**	**Percentage**
Kidney damage	5	14%
Makes body weak	4	10%
Neck pain	4	10%
Back pain and headache	3	7%
Death	3	7%
Headache	3	7%
Tiredness	3	7%
Affects the brain	2	5%
Back pain	2	5%
Body damage	2	5%
Body pain	2	5%
Causes reproductive problems and kidney damage	2	5%
Makes you old	2	5%
Back pain and neck pain	1	2%
Damages the spinal cord	1	2%
Makes the body unhealthy	1	2%
Stroke	1	2%
Total	41	100%

4.6.3 MSDs effects besides health

Only 13 (25%) of the respondents said MSDs may affect them in other ways apart from their health. Of the 13 respondents who said MSDs affected them in other ways apart from their health, 4 (31%) cited a reduction in wages, 23% said that this may lead to absenteeism as a result of MSDs.

Table 4.22: Results of non-health effects of MSDs (n= 13)

Other MSDs effects	Frequency	Percentage
Pay will be less	4	31%
Absenteeism at work	3	23%
Family will not be happy	3	23%
Delay work	2	15%
Lose the job	1	8%
Total	13	100%

4.7 Intervention to overcome the development of MSDS

4.7.1 Prevention of MSDs at work

Out of 52 operators who know about the effect of MSDs on health, more than half of the drivers (58%) did not know how MSDs could be prevented at the workplace and 42% said that they knew about how the condition could be prevented. The drivers who knew about how MSDs could be prevented at work mentioned several ways, including avoiding sitting for prolonged periods (25%) and teaching workers and bosses about MSDs with 15%.

Table 4.23: Methods used to prevent MSDs (n=20)

MSD prevention methods	Frequency	Percentage
Avoid long sitting	5	25%
Teach workers and bosses about MSDs	3	15%
Get good bosses	2	10%
Pray for protection	2	10%
Teach workers about MSDs	2	10%
Avoid work overload	1	5%
Do medical check-ups regularly	1	5%
Get kidney belts regularly	1	5%
Get time to rest and stretch	1	5%
Reduce work pressure	1	5%
Use new model machines	1	5%
Total	20	100%

4.7.2 Employers effort in MSDs prevention

Two thirds (65%) of the operator drivers reported that their organisations were not doing anything to protect workers from MSDs.

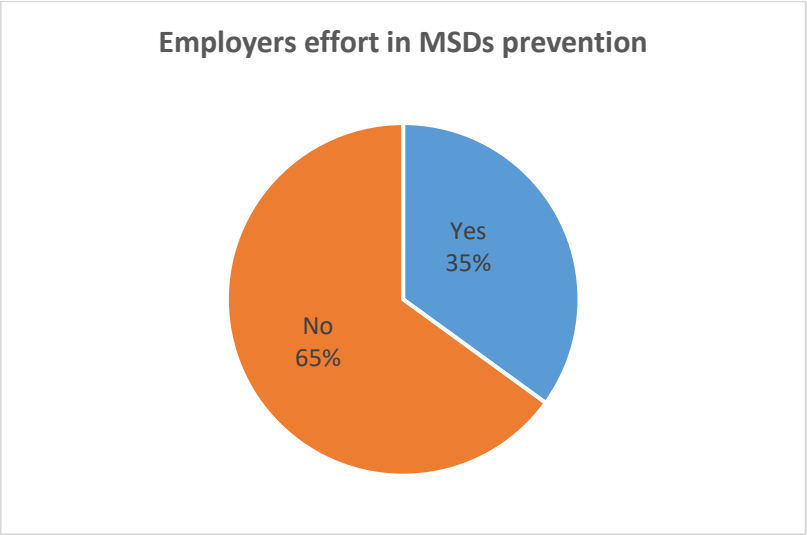


Figure 4.10: Employers effort in MSDs prevention (n=52)

4.7.3 Methods used by companies (employers) to prevent MSDs

Among the few operator drivers who reported that their organisations were doing something to protect them from MSDs mentioned that they are provided with kidney belts and the also provision of time as represented by 9(50%) respondents, old kidney belts and time to rest had 6(33%) respondents and the rest are only given time to rest.

Table 4.24: Methods of preventing MSDs used by companies (n=18)

MSD prevention methods	Frequency	Percentage
Kidney belt and time to rest	9	50%
Old kidney belt and time to rest	6	33%
Time to rest	3	17%
Total	18	100%

4.8 The presence of MSDs among operator drivers

Altogether, 58% of the operator drivers in the study experienced MSDs and 42% did not suffer from the condition.

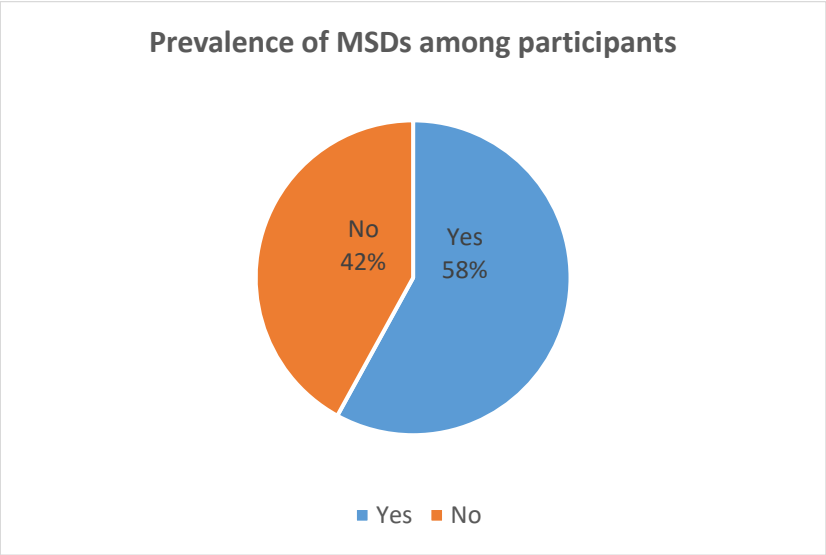


Figure 4.11: Prevalence of MSDs among participants (n=182)

4.9 MSDs by demographics

The percentage of operator drivers with MSDs was significantly higher among drivers aged 40 years or older (79%), compared to 39% for those below 40 years (p=0.00). The prevalence of MSDs was also significantly higher among the married (68%) compared to 48% among single respondents (p=0.01). The MSD prevalence was significantly higher among drivers with primary or no formal education (72%) compared to 45% for those with secondary or higher education (p=0.00). Finally, MSD prevalence was significantly higher among those who had been driving for 10 years or more (81%) compared to 39% for those with less than 10 years of driving experience (p=0.00).

Table 4.25: Musculoskeletal disorder by demographics (n=182)

Category	N	Percentage experiencing MSDs	Chi-Square test		
			Value	df	Sig.
Age group			**30.526**	**1**	**0.00***
Below 40 years	96	39%			
40 years or older	86	79%			
Marital status			**7.42**	**1**	**0.01***
Single	92	48%			
Married	90	68%			
Education			**12.940**	**2**	**0.00***
Below secondary	85	72%			
Secondary or higher	97	45%			
Years as an operator driver			**32.456**	**1**	**0.00***
Less than 10 years	102	39%			
10 years or more	80	81%			

***p<0.05**

4.10 MSDs by social habits

The percentage of operator drivers with MSDs was significantly higher among smokers (70%) compared to non-smokers (47%) (p=0.00). The percentage of operator drivers with MSDs was significantly higher among those who consumed alcohol (63%) compared to non-drinkers (48%) (p=0.04). The percentage of operator drivers with MSDs was also significantly higher among those who did not partake in any physical fitness activities (78%) compared to 39% among drivers who engaged in physical fitness activities (p=0.00).

Table 4.26: Musculoskeletal disorder by social habits (n=182)

Category	N	Percentage experiencing MSDs	Chi-Square test		
			Value	df	Sig.
Smoking			**10.06**	**1**	**0.00***
Smoker	84	70%			
Non-smoker	98	47%			
Alcohol consumption			**3.874**	**1**	**0.04***
Consumes alcohol	121	63%			
Does not consume alcohol	61	48%			
Physical fitness activities			**28.609**	**1**	**0.00***
Does fitness activities	95	39%			
No fitness activities	87	78%			

***p<0.05**

4.11 MSDs by workplace habits

The percentage of operator drivers with MSDs was significantly higher among those who sat for prolonged times (p=0.01), were exposed to vibration (p=0.00), sat with a rounded back (p=0.03), and made repetitive neck and wrist movements (p=0.02).

Table 4.27: Musculoskeletal disorder by workplace habits (n=182)

Category	N	Percentage experiencing MSDs	Chi-Square test		
			Value	df	Sig.
Period sitting			**8.461**	**1**	**0.01***
Prolonged sitting	176	60%			
No prolonged sitting	6	0%			
Exposure to vibration			**11.411**	**1**	**0.00***
Exposed to vibration	174	60%			
Not exposed to vibration	8	0%			
Sitting posture			**4.91**	**1**	**0.03***
Sit with a rounded back	107	64%			
Sit with a straight back	75	48%			
Neck and wrist movements			**5.577**	**1**	**0.02***
Repetitive movements	178	59%			

No repetitive movements	4	0%			
Strained body position for a prolonged time			**0.226**	**1**	**0.63**
Yes	92	59%			
No	87	55%			
Working in a confined space			**0.234**	**1**	**0.63**
Yes	41	61%			
No	141	57%			
Working hours			**0.78**	**1**	**0.38**
8 hours	109	55%			
More than 8 hours	73	62%			
Time to rest within working hours			**2.838**	**1**	**0.09**
Yes	159	55%			
No	23	74%			
Driving hours schedule			**0.659**	**1**	**0.42**
High	177	58%			
Low	5	40%			

4.12 Association between awareness and experiencing MSDs

The percentage of operator drivers with MSDs was significantly higher among those who were not aware of the condition (63%) compared to 44% among those who were aware of the condition (p=0.02).

Table 4.28: Musculoskeletal disorders by awareness of MSDs (n=182) Awareness	**N**	**Percentage experiencing MSDs**	**Chi-Square test**		
			Value	df	Sig.
Aware of MSDs	52	44%	**5.405**	**1**	**0.02***
Not aware of MSDs	130	63%			

***p<0.05**

4.13 Risk factors for musculoskeletal disorders

A total of 12 variables that were associated with MSDs as shown in the chi-square test results reported earlier were included in logistic regression models to examine if they were significant risk factors for MSDs. The results of the initial univariable logistic regression models are summarised in the table below and 3 of the 12 variables failed to meet the significance level of p<0.20 and they were dropped from the next step of the logistic regression model. These were prolonged sitting (p=1.00), exposure to vibration (p=1.00) and repetitive neck and wrist movements (p=1.00).

Table 4.29: Invariable logistic regression models results

Covariates	**Wald**	**df**	**Sig.**	**Exp (B)**	**95% CI**	
					Lower	**Upper**
40 years or older	28.23	1	**0.00***	6.0	3.1	11.7
Married	7.31	1	**0.01***	2.3	1.3	4.2

Below secondary school	12.56	1	**0.00***	3.1	1.6	5.7
10 years or more operator experience	29.45	1	**0.00***	6.7	3.4	13.4
Smoker	9.83	1	**0.00***	2.7	1.4	4.9
Consumes alcohol	3.83	1	**0.05***	1.9	1.0	3.5
No physical fitness activities	26.65	1	**0.00***	5.6	2.9	10.8
Prolonged sitting	0.00	1	1.00	2.389082514.1	0.0	
Exposed to vibration	0.00	1	1.00	2458331282.6	0.0	
Sit with a rounded back	4.86	1	**0.03***	2.0	1.1	3.6
Repetitive neck and wrist movements	0.00	1	1.00	2323628198.6	0.0	
Not aware of MSDs	5.31	1	**0.02***	2.2	1.1	4.1

***p<0.20, Exp(B)=adjusted odds ratio (OR)**

The remaining 9 variables of age group, marital status, level of education, years as a driver, smoking, alcohol consumption, physical fitness activities, sitting posture, and MSDs awareness were entered as covariates in a multivariable binary logistic model. The contribution of each of the nine covariates to the model is shown in the table below. The number of years as an operator driver (p=0.00), alcohol consumption (p=0.03), physical fitness activity (p=0.00) and MSDs awareness (p=0.04) were shown to be significant predictors of MSDs. The other 5 variables with p>0.05 were left out of the final model run.

Table 4.30: Multivariable logistic regression results

Covariates	**Wald**	**df**	**Sig.**	**Exp (B)**	**95% CI**	
					Lower	**Upper**
40 years or older	0.58	1	0.45	1.6	0.5	4.9
Married	0.01	1	0.91	1.0	0.4	2.2
Below secondary school	0.81	1	0.37	1.5	0.6	3.5
10 years or more operator experience	14.16	1	**0.00***	10.1	3.0	33.5
Smoker	0.00	1	0.96	1.0	0.4	2.5
Consumes alcohol	4.67	1	**0.03***	3.1	1.1	8.4
No physical fitness activities	20.73	1	**0.00***	7.9	3.2	19.1
Sit with a rounded back	0.36	1	0.55	1.3	0.6	3.0
Not aware of MSDs	4.39	1	**0.04***	2.6	1.1	6.3
Constant	41.33	1	0.00	0.0		

***p<0.05, Exp(B)=adjusted odds ratio (OR)**

The final model was a good fit to the data (Hosmer and Lemeshow=5.99, p=0.54) and the odds ratios for MSDs associated with these variables are shown in the table below:

- Operators who had been driving for 10 years or more were 15 times more likely to experience MSDs compared to those with less than 10 years' experience (OR=15.3, 95% CI: 6.0 – 39.0), p=0.00.
- Operators who consumed alcohol were about 3 times more likely to experience MSDs compared to those who did not consume alcohol (OR=2.8, 95% CI: 1.1 – 6.7), p=0.02.
- Operators who did not engage in any physical fitness activity were about 9 times more likely to experience MSDs compared to those who engaged in physical fitness activities (OR=8.8, 95% CI: 3.8 –20.4), p=0.00.
- Operators who were not aware of MSDs were 3 times more likely to experience MSDs compared to those who were aware of the condition (OR=3.1, 95% CI: 1.3 –7.3), p=0.01.

Table 4.31: Adjusted odds ratios for MSDs among operator drivers

Covariates	Wald	df	Sig.	Exp (B)	95% CI	
					Lower	Upper
10 years or more operator experience	32.65	1	**0.00***	15.3	6.0	39.0
Consumes alcohol	5.12	1	**0.02***	2.8	1.1	6.7
No fitness activities	25.72	1	**0.00***	8.8	3.8	20.4
Not aware of MSDs	6.53	1	**0.01***	3.1	1.3	7.3
Constant	43.60	1	0.00	0.0		

***p<0.05, Exp(B)=adjusted odds ratio (OR)**

Section B: Qualitative data results

The interview guide used to collect qualitative from the managerial staff was developed using the quantitative results obtained from operator drivers. The following themes delineate findings from the managerial staff.

4.14 Employees in managerial positions take on MSDs

The following results were elicited from interviews held with managerial staff. The results are presented in themes supported by participants' quotes.

4.14.1 Awareness level

Theme 1: Lack of awareness on MSDs

Lack of awareness of any musculoskeletal disorder contributes highly to the development of injuries at workplaces (Zein et al., 2015). Therefore, in the absence of awareness, one would expect accidents and high levels of disorders among the operators. The response from employees in managerial

positions when asked if there was an awareness of the existence of MSDs amongst their operator drivers, the most common responses from the company representatives were:

Participant 1: "*I know MSDs exists but I cannot remember receiving any complaint from my operators. I am not saying we have zero cases of MSDs amongst them because we have people who do not like anyone to pick up that they are suffering from a certain illness".*

Participant 2: *"There are a lot of disorders out there. But not so familiar with this one or maybe we are not on the same page. And no one said they were suffering from it"*

Participant 3: *"Yes (we are aware), but not so much or to the highest degree. Mostly operators complain about slight back pain, which does not even stop them from working".*

Participant 4: *"I know what it is, by definition, but haven't picked up a case within our people. Generally, the possibility of it being present in our company is very high though due to the nature of work that the operators do".*

Participant 5: *"You may, however, see them (operators) stretching their backs but that does not mean anything. Even I stretch every time I stand up from my seat, but it does not mean I have back problems".*

The most common response from the company representatives was that they knew about MSDs in general but that this did not imply MSDs were prevalent within their organisations. Some were aware of some disorders which may be going on within their organisations but were unsure if they could be classified as MSDs. The stance was also that so long as the operators did not alert the company about feeling any discomfort, then the company would not take it upon themselves to find out and thus they assumed that everything was normal or no special attention required.

Theme 2: Poor information dissemination

The absence of information to employees can negatively affect the way of doing things at work, as employees may not be aware of what is right or what is wrong to do. When employees in managerial positions were asked whether they provide training or share any information regarding MSDs with the employees, their responses were as follows:

Participant 1: *"No, we don't provide them with any specific information to MSDs per se, but we always tell them to always use their protective gears such as kidney belts".*

Participant 2: *"Every time we tell them to put their health first and practice safety and that also includes MSDs".*

Participant 3: *"Our operators do not experience any MSDs we know of, so nothing".*

Participant 4: *"No, we don't give them such information".*

Based on the responses, it clearly shows that there is an absence of sharing information on MSDs within the participating companies, with some companies giving a justification for not providing information about MSDs which was that their operators don't experience any such disorders and therefore they did not require any information about it.

4.14.2 WMSDs risk factors among operator drivers

Theme 3: Absence of well-defined reporting platform

The lack of proper reporting structures within an organisation creates/ results in missing some of the necessary information within the organisation. Upon picking up that most managers seemed not to be familiar with MSDs, they were asked if there is any platform where their employees can report all incidences including those of MSDs and their responses were as follows:

Participant 1: *"The platform is for reporting anything not to say only MSDs. We always tell them to report to us anything".*

Participant 2: *"MSDs is not really a big problem with us just like I said at the beginning. It's just the slight back pains which even those experiencing them are not reporting".*

Participant 3: *"They are always free to tell us anything that affects them anytime they want or experience it. But our people sometimes are just not free, they will tell you all is okay while it's not the case".*

Participant 4: "Sometimes, especially during lunch, you may see them talking where one can tell they are talking about something important but the moment you go closer to them then they keep quiet or change the topic completely".

Judging from the responses, most of the feedback was that employees were encouraged to report any matters to management. As such, there were no separate channels or methods that were dedicated to the reporting of health-related matters. There was a sentiment that even where channels for reporting were put in place, these would not help much due to a general culture by employees of keeping things to themselves.

Theme 4: Partial protection against MSDs

Absence of full protection of workers from musculoskeletal disorders can greatly be associated with the occurrence of these disorders among operators. Companies' representatives were asked how they are protecting their employees from MSDs when at work and they responded as follows:

Participant 1: *"Not for MSDs but safety in general. We always give them overalls, boots, and they work 8 hours a day, or sometimes more because work needs to be completed on time".*

Participant 2: *"Our workers are hardworking, and we always try to protect them. We give the clothing such as overalls and safety boots which we are strict about. If you don't have overalls, then no work for you".*

Participant 3: *"We have provided them with kidney belts although, as I mentioned, not all of them are having belts in a good condition. The country really has no money, and we are struggling too but we will make a plan for our drivers soon".*

Participant 4: *"They are provided with kidney belts but only maybe over 80 % do make use of their belts well, more especially the older drivers…either they forgot them, or other funny reasons, but we always caution them".*

The responses indicate that none of the participating companies has the full protection of their employees from MSDs. Those that are given kidney belts are not enforced on the usage, but organisations rather threaten the employees with the prospect of the company absolving itself from any liability from health problems arising out of improper usage of the protection provided. Some indicated that the protection was being provided to employees but just general protection and not specific to the prevention of MSDs. Others also indicated that the quality and amount of the protective equipment being provided to employees was not adequate, in some cases, due to financial constraints.

4.14.3 Effects of MSDs

Theme 5: Unestablished effect of MSDs on performance

If the effect of MSDs is not established, this may involve a loss to the company without it being able to associate it to what is going on within the establishment.

Participant 1: *"It's difficult for me to answer because we have not experienced MSDs yet. So, it's not easy for me to link the two".*

Participant 2: *"Performance? the only enemy of performance is people, especially those that don't want to work, lots of sick leave here and there! And the economic downfall that the country is facing now is also another problem".*

Participant 3*: "Performance has been good. The only thing that may affect performance at work is when people are being absent from work due to false medical reasons which are purely lack of commitment, otherwise no problem".*

Participant 4: *"Performance is good because we made sure that their performance and the hours worked to determine their monthly payments. If you don't work hard then no money for you".*

In line with the fact that most of the company representatives did not feel that there was any significant prevalence of MSDs within their organisations, the predominant view was that MSDs were not having any major effect on organisational performance. As such, the managers tended to associate any non-optimal organisational performance with the economic downturn rather than any health-related challenges within the organisations.

Some were also reluctant to associate any poor organisational performance to MSDs or other such health matters, choosing to associate that to employees' work attitude instead. Dissociating employee health challenges from the organisational performance was also apparent in the assertion that as long as employee earnings were linked to employee performance, overall organisational performance would not be affected.

4.15 Chapter summary

This chapter presented the study findings using tables, figures and themes. The findings contain information on risk factors, level of awareness and impact of MSDs among Operator Drivers in North-Western Namibia. Lack of awareness, lifestyle and demographic risk factors were the leading factors contributing to MSDs.

CHAPTER FIVE

DISCUSSION OF RESULTS AND CONCLUSION

5.1 Introduction

The main objective of the study was to assess the risk factors and the level of awareness about musculoskeletal disorders among operator drivers in North-western Namibia. Therefore, this chapter will discuss and conclude the findings of the study, a recap of the problem statement following the assessed research objectives as outlined below.

5.2 The risk factors associated with WMSDs among operator drivers

This study assessed the risk factors associated with WMSDs among operator drivers at work. This study established that 106 operator drivers suffered from WMSDs thus giving a prevalence rate of 58%. This rate is almost similar to that of a study by Abledu et al. (2014) who got a 58.8% prevalence rate of MSDs among taxi drivers in Ghana. This prevalence rate is relatively higher than 54% among Chinese drivers, 50% amidst drivers in Peninsular Malaysia and 24.3% in Iran as reported by Ekpenyong and Inyang (2014). However, the study's prevalence was lower than 88.7% in Dar es Salaam, Tanzania, 73.5% in India, 72.5% in the USA and 59% in Sao Paulo, Brazil (Madan & Grime, 2015). The present study results revealed that risk factors associated with the development of WMSDs among operator drivers were task-related physical and individual operator differences factors.

5.2.1 Work-related risk factors

Task-related physical factors which involve awkwardness of head and neck posture, repetitive shoulder movements and vibration are the main factors that are responsible for the development of WMSDs among operator drivers in this study. Zein et al. (2015) point out that the high prevalence of musculoskeletal discomfort is contributed by the driving task itself which is monotonous and static. A total of 176 (97%) operator drivers reported having experienced episodes of prolonged sitting, with 107(59%) experiencing awkward positions either with a rounded back or with shoulders slumped. This means that the majority of the operator drivers had significant exposure to ergonomics risk factors which are highly attributed to WMSDs. The current study results are supported by Anyfantis et al.'s (2017) findings who showed that taxi drivers were subdued to limited space behind the driving-wheel and prolonged sitting, all adding up to fatigue of low back muscles and postural strain on the lumbar spine. Also, Zein et al. (2015) realised that awkward sitting was significantly linked to discomfort and high LBP. Drivers who reported awkward sitting and discomfort were at eight times more at risk for LBP than drivers who sat comfortably on their seats. Epidemiological studies indicate that prolonged sitting on uncomfortable seats with awkward postures and without lumber support or back support

will lead to increasing posture stress, which in turn causes musculoskeletal problems such as LBP (Madan & Grime, 2015).

Several studies have established a significant association between vibration (due to driving) and MSDs. In the current study, 174 (96%) operator drivers were exposed to vibration during work. This high number of operator drivers that are exposed to vibration can be attributed to their job tasks that are linked to the mobility of the machines they drive. However, even though the majority of the respondents were exposed to vibration, there is no significant association between the perception of vibration exposure and WMSDs. Perception of vibration in this study cannot be reliably used as a determinant of WMSDs due to the non-existence of proper and validated assessment and measurement on vibration exposure among operator drivers.

More than half 109 (60%) of the operator drivers worked 8 hours in a shift/day, whereas 73 (40 %) worked more than 8 hours. From the 73 operator drivers working more than 8 hours per shift, 64 (35%) worked for 9 hours and 9 (5%) worked for 10 hours or more. All 182 (100%) operator drivers were given off days to rest. These findings show that only 73 (40%) drivers were more exposed to sitting in a relatively confined uncomfortable place with minimal mobility of limbs and repetitive movements of the neck and hands thus pressuring the musculoskeletal system as they worked more than 8 hours per shift. These findings suggest a link in the development of WMSDs and prolonged driving hours as supported by Yan et al. (2017) whose study in Taiwan found out that Taipei taxi drivers driving more than 8 hours per day were significantly associated with risks of knee disorders. Madan and Grime (2015) concur that working more than 8 hours a shift results in burnout and other occupational diseases such as WMSDs. Thus, driving for more than 8 hours a shift reinforces the exposure of operator drivers to WMSDs due to prolonged awkward postures, sitting without body movements and whole-body vibration.

5.2.2 Non-work-related risk factors

Operator drivers over the age of 40 years or older (89) (79%) had significantly higher chances of experiencing WMSDs compared to those below 40 years (98) (39%). This shows that increasing age and years of driving are related to the musculoskeletal problem as supported by Oakman et al. (2018) who showed that neck complaints occur more often among drivers within the 40 – 55 years old ranges. The association between the duration of work and WMSDs was also revealed by Yan et al. (2017), with $p<0.01$ for participants who worked for 16-20 years compared to those that worked for less than 5 years.

This study established a significant connotation between the increased length of service and the occurrence of MSDs among operator drivers. Operator drivers who had been driving for 10 years or more (101) (56%) were 15.3 times more likely to experience MSDs compared to those with less than 10 years' experience (81) (44%) of driving (OR=15.3, 95% CI: 6.0 – 39.0) (p=0.00). The p-value shows a statistically significant association in the length of service and the development of WMSDs.This points out that the more years that drivers are exposed to driving, the more they are prone to MSDs. This is supported by Palmer and Goodson (2015) who discovered that drivers with more than 10 years' experience suffered lower back pain due to cumulative exposure to the workload, their health status, and the ageing process. Tanui (2016) concurs that employees who have worked for many years are also prone to occupational diseases such as WMSDs, especially if they are exposed to disease-causing agents for many years. However, contrary to these findings, Anyfantis et al. (2017) showed that drivers who worked for less than 10 years, and also without working experience were prone to shoulder pain and discomfort compared to respondents with previous working experience. Tanui (2016) adds that nurses who have worked for many years are more knowledgeable in terms of their profession and are familiar with the work process and procedures due to more years at work and they are thus mindful of their health and wellbeing at work. Also, drivers with previous driving experience may have the advantage of optimising their driving skills, knowledge, and techniques thus making them less prone to musculoskeletal discomfort

This study established an association between WMSDs and alcohol consumption. WMSDs among operator drivers were significantly higher among those who consumed alcohol (124) (68%) in comparison to 58(32%) who did not consume alcohol (OR=2.8, 95% CI: 1.1 – 6.7, p=0.02). This implies that operator drivers who consumed alcohol were about 2.8 times more likely to experience WMSDs. Subsequently at 95% CI (1.1 – 6.7) does not include the null value and p-value of 0.02 indicates a statistical significance of alcohol consumption in contributing to the development of WMSDs among operator drivers. These current findings are consistent with Palmer and Goodson (2015) who noticed an association between WMSDs and alcohol consumption. Also, Adetiba (2017) found out that alcohol and tobacco products had an adverse effect of the weakening of blood vessels, joints and muscles thereby causing severe complaints of WMSDs among the drivers. Alcohol can also influence the central nervous system by changing the perceptions of pain which would explain musculoskeletal pains in other regions of the body.

An association between physical fitness and WMSDs was significantly established in the current study. WMSDs were significantly higher to more than half of the operator drivers (92) (51%) who did not partake in any physical fitness activities compared to 90(49%) operator drivers who participated in physical fitness activities (OR=8.8, 95% CI: 3.8 –20.4, p=0.00. This denotes that the majority of the

operator drivers were not involved in physical activities thus physically inactive operator drivers were 8.8 times more likely to experience WMSDs. The p-value shows a statistical significance between the lack of physical activities and development of WMSDs. These findings are in agreement with a study by Qutububbin, Hebbal and Kumar (2013) in Israel. Moreover, Deros, Daruis, and Basir (2015) in Italy displayed an association between being physically inactive and the development of WMSDs.

5.3 The operator drivers' and employers' level of awareness on WMSDs

This study revealed that only 29% of the operator drivers had information on WMSDs compared to the majority (71%) who knew nothing about WMSDs (OR=3.1, 95% CI: 1.3 –7.3, p=0.01. Operators who were not aware of MSDs were 3.1 times more likely to experience MSDs compared to those who were aware of the condition. This study further showed that more than half (63%) of the operator drivers succumbed to WMSDs without their acknowledgement. These findings, therefore, signify a lack of awareness among operator drivers which could exacerbate WMSDs. Qualitative results revealed that the management was aware of certain occupational conditions affecting the operator drivers, however, they were not sure if such occupational conditions could be classified as WMSDs. This implies that the members of management were not sure of the existence of WMSDs. Being unsure could denote that the management was not aware, which coincides with the quantitative results from operates drivers (in which the majority were not aware of WMSDs). The qualitative results also clearly show the absence of sharing information on MSDs within the participating companies. Both qualitative and quantitative results show a lack of awareness among operator drivers and employers.

These findings concur with Ismaila (2010) who is a study in Nigeria showed that only 3.4% of the participants were aware of MSDs. Zein et al. (2015) further highlighted that lack of awareness among employees developed a trend of bearing any work without understanding the stress that the kind of work may impose on the body and some of the employees may not notice that their bodies are under pressure until the point where they are not able to tolerate the pain. These findings suggest that lack of awareness among Namibian operator drivers could emanate from the inability to derive benefits of MSDs information as alluded by Boro et al. (2013) in a study that was conducted in banking institutions in Nairobi, Kenya. Contrary to these findings, Akinpelu et al. (2011) revealed that 52% of the Nigerian occupational drivers were aware of MSDs, hence they knew how MSDs are prevented. Equipped with awareness information, employees are cautious as they will know how to protect themselves from WMSDs through practising the required measures.

5.4 The effects of WMSDs on operator drivers and their employers

Quantitative results demonstrated that operator drivers (178) (98%) experienced repetitive neck and wrist movements thereby straining their body parts. This increase of discomfort mainly on the neck among operator drivers could be as a result of a poorly designed driver's seat thereby leading to awkward driving posture. According to Anyfantis et al. (2017), prolonged sitting during driving may lead to tension and stiffness in the neck and lumbar region and thus cause discomfort and pain as well as lower back pain. Operator drivers adopt more repetitive movements of the hand, thus justifying why they experienced discomfort in the wrist and elbow. The discomfort at the wrist may be due to the excessive grip on the steering or excessive force on the wrist when handling the control panel.

Furthermore, the qualitative results revealed that the majority of the managerial staff could not establish organisational performance to the development of MSDs. This is risky because it may involve a loss to the company without it being able to find an association with what is going on within the establishment. Most staff mentioned the effects on organisational performance as being aligned to downtime, that is due to employees' absence from work due to false medical reasons.

Health effects such as backache, neck pains and general body pains were also mentioned as occurrences that are as a result of WMSDs. The qualitative results concur with qualitative results obtained from the operator drivers, and both outcomes acknowledge that these effects affect organisational performance and the consequent ill-health effects.

Darvishi et al. (2017) found out that MSDs are major reasons leading to loss of work efficiency as well as early ill-health retirement among dentists and the prevalence and severity of these disorders decrease by performing regular specific exercises as shown by the present study. Santos et al. (2017) echoed that risk factors resulted in musculoskeletal complaints, sick leave, and switching and leaving jobs.

5.5 Conclusion

In conclusion, therefore, the study's objectives were met as follows:

Objective 1: To investigate the risk factors associated with WMSDs among operator drivers at work

The study established that lifestyle, social, demographic, physical task-related and psychological factors were responsible for MSDs among operator drivers. It was also noted that increased length of service, lack of physical fitness activities, lack of awareness on MSDs, unconducive work environment such as high workload, high exposure to vibration and sitting with a rounded back (prolonged sitting in awkward positions) are the main determinants of MSDs.

Objective 2: To assess the operator drivers' and their employers' level of awareness about MSDs

Lack of operators' awareness of MSDs was very high, and this contributes to drivers suffering from MSDs as 63% of those who were not aware experienced MSDs as compared to 44% of those who were aware of the condition. The general view of respondents at management level showed that they were aware of the general nature of MSDs but they were unsure of its prevalence among their employees thus they regarded it as ordinary everyday discomforts which do not warrant any special attention.

Objective 3: To evaluate the effects of WMSDs on operator drivers and their employers

The responses indicate that the continuous occurrence of MSDs makes the body unhealthy due to exposure to risk factors. This result in increased discomfort mainly on the back, arms and neck. Since most managers do not acknowledge the presence of MSDs among their operators, the majority associated their non-optimal performance with the economic downturn rather than any health-related challenges.

5.6 Chapter Summary

The chapter deliberated on the outcomes of the study, starting with the demographic information of the study population, risk factors associated with the development of WMSDs, level of awareness on WMSDs and lastly the effects of WMSDs on employers and employees. It was found that the operators are exposed to both non-work-related and work-related risk factors which have a great association with the development of MSDs. The level of awareness was found to be low amongst both the employers and the employees respectively. The study also showed that MSDs affect the operators' health, however, the effects on organisational performance are linked to employees being uncommitted and their absenteeism.

CHAPTER SIX

RECOMMENDATION

The following recommendations are made based on the findings and conclusion of the study as per the study objective 4, namely, to establish possible interventions on overcoming the development of WMSDs.

To solve the problem of work-related musculoskeletal disorders, one approach would be to create awareness and ensure compliance to set health and safety regulations within the organisation.

6.1 Recommendations to employers

- Introduce awareness WMSDs programmes together with continuous refresher occupational health and safety training programmes.
- Conduct screening and periodic health assessment of drivers for possible fitness, thus those unfit will be allocated to light duties.
- Establish occupational safety and health management committee within their organisation. Members of the committee will be responsible for monitoring others regularly while carrying out their work and be able to correct them right away until they are used to correct practices.
- Purchase more ergonomic friendly tools, equipment, vehicles and types of machinery which can be used by the operators with minimal effect to their health, which will in return lower the chances of developing MSDs.
- Adopt ISO 18001: OSHAS as it guides towards attaining a safe working environment for the employees.

6.2 Recommendations to operator drivers

- Operator drivers should attend and fully participate in WMSDs awareness programmes to enhance their level of knowledge on MSDs prevention.
- Adhere to the work-related procedures and policies such as the use of Personal Protective Equipment/Clothing, and all safeguarding measures provided to best protect themselves when at work.
- Actively involve themselves in physical activities such as exercising. Exercises are proven to be effective in reducing the development of MSDs.
- Restrain from smoking and alcohol consumption as these have a great association with the development of MSDs.

6.3 Recommendations to the Ministry of Health and Social Services / Government

- Ensure credibility in WMSDs recording through strengthening the Health Information System. This will help in determining the exact causal factor of a specific disorder and consequently help in developing the relevant preventative measures.

- Ensure effective compliance of set regulations related to the health and safety of employees. This can be attained through strict continuous monitoring of their operations. A watchdog body can be established, together with law enforcement agents for regular visits to organisations with fines being imposed on culprits.

6.4 Future studies

Since this study quest was to explore the effects and level of awareness of operator drivers in the mining and construction industry, there is need to undertake a comparative analysis as to which industries and sectors where operator drivers are mostly affected by WMSDs. Such a study will identify the factors or elements which elicit a difference in WMSDs.

A qualitative study focusing on operator drivers can also be undertaken to unveil the knowledge, experiences and attitudes of operator drivers in light of WMSDs.

6.5 Chapter Summary

Recommendations were made to employers, operator drivers, Ministry Health and Social Services and for future studies in Chapter 6.

REFERENCES

Abledu, J. K., Offei, E. B., & Abledu, G. K. (2014). Occupational and personal determinants of musculoskeletal disorders among urban taxi drivers in Ghana. *International Scholarly Research Notices, 1*(1), 1-5.

Adetiba, J. N. (2017). *The prevalence and risk of musculoskeletal disorders among dental technicians in South Africa.* Capetown: University of KwaZulu Natal.

Ahlstrom, C., Gink Lovgren, M., Nilsson, M., Willstrand, T., & Anund, A. (2018). The effect of an active steering system on city bus drivers muscle activity. *International Journal of Occupational Safety and Ergonomics, 1*(1), 1-39.

Akinpelu, A. O., Oyewole, O. O., Odole, A. C., & Olukoya, R. O. (2011). Prevalence of musculoskeletal pain and health-seeking behaviour among occupational drivers in Ibadan, Nigeria. *African Journal of Biomedical Research, 14*(2), 89-94.

Akweetelela, A. (2019). *Investigation of the prevalence, risk factors and impact of musculoskeletal disorders among nurses at Katutura Intermediate Hospital, Khomas Region, Namibia.* Windhoek: University of Namibia.

Ali, A., Qutubuddin, S. M., Hebbal, S. S., & Kumar, A. C. (2012). An ergonomic study of work-related musculoskeletal disorders among the workers working in typical Indian sawmills. *International Journal of Engineering Research and Development, 3*(9), 38-45.

Anyfantis, I. D., & Biska, A. (2017). Musculoskeletal disorders among Greek physiotherapists: Traditional and emerging risk factors. *Safety and Health at Work, 9*(3), 313-319.

Baker, T. (2007). *Doing Social Research (2nd Edn.).* New York: McGraw-Hill Inc.

Bevan, S. (2015). Economic impact of musculoskeletal disorders (MSDs) on work in Europe. *Best Practice & Research Clinical Rheumatology, 29*(3), 356-373.

Boro, W., Andanje, M., & Onywera, V. (2013). *Assessment of Employee Awareness of the Applicability of Ergonomic Exercises in the Banking Institutions in Nairobi, Kenya.* Nairobi.

Briggs, A. M., Cross, M. J., Hoy, D. G., Sànchez-Riera, L., Blyth, F. M., Woolf, A. D., & March, L. (2016). Musculoskeletal health conditions represent a global threat to healthy ageing: A report for the 2015 World Health Organization world report on ageing and health. *The Gerontologist, 56*(2), 243-256.

Center for Disease Control and Prevention. (2018, February 21). *Musculoskeletal health Program. Retrieved from.* Retrieved from cdc.gov/niosh/programs: https://www.cdc.gov/niosh/programs/msd/default.html

Cochrane, J. (1973). *Multiple Criteria Decision Making.* Columbia: University of South Carolina Press.

Cooper, D. R., & Schindler, P. S. (2016). *Business research methods* (12th ed.). Boston: McGraw-Hill.

Creswell, J., & Garrett, T. (2008). The "movement" of mixed methods research and the role of educators. *South African Journal of Education, 4*(9), 58-88.

Creswell, J., & Garrett, T. (2008). *The "movement" of mixed methods research and the role of educators.* South African Journal of Education: 58-88.

Darvishi, E., Karimi, S., Ebrahimi, H., Charkhandaz Yeganeh, R., & Salimi, S. (2017). Risk Factors of Musculoskeletal Disorders in Bus and Truck Drivers. *Archives of Occupational Health, 1*(1), 23-28.

Denzin, N. (2017). *A SAGE handbook for Qualitative Research* (8th ed.). London: SAGE Publication.

Deros, B. M., Daruis, D. D., & Basir, I. M. (2015). A study on ergonomic awareness among workers performing manual material handling activities. *Procedia-Social and Behavioural Sciences, 19*(5), 1666-1673.

Ekpenyong, E., & Inyang, C. (2014). The association between workers characteristics, workplace factors and work-related musculoskeletal disorder: A cross-sectional study of male Construction Workers in Nigeria. *International Journal of Occupational Safety and Ergonomics, 20*(3), 447-462.

European Agency for Safety and Health at Work. (2010). *Work-related musculoskeletal disorders in the EU-facts and figures (European Risk Observatory Report)*. Retrieved April 11, 2019, from https://osha.europa.eu/en/tools-and-publications/publications/reports/TERO09009ENC

Hakim, S., & Mohsen, A. (2017). Work-related and ergonomic risk factors associated with low back pain among bus drivers. *Journal of Egyptian Public Health Association, 92*(3), 195-201.

Health and Safety Executive. (2017, August 14). *Work-related musculoskeletal disorder (WRMSDs) statistics in Great-Britain 2017.* Retrieved January 09, 2020, from http://www.hse.gov.uk/statistics/causdis/musculoskeletal/msd.pdf

Ismaila, S. (2010). Australian Journal of Basic Applied Science. *A Study on Ergonomics Awareness in Nigeria, 4*(5), 731–734.

Israel, G. D. (1992). *Determining the sample size.* Gainesville: University of Florida Cooperative Extension Service.

Leedy, P., & Nimrod, J. (2016). *Practical Research: Planning and Design* (11th ed.). Oxford: Pearson.

Luttmann, A., Jager, M., Griefahn, G., Caffier, G., & Liebers, F. (2003). *Preventing musculoskeletal disorder in the workplace, WHO*. Retrieved October 17, 2019, from http://apps.who.int/iris/bitstream/10665/42651/1/924159053X.pdf?ua=1

Madan, I., & Grime, P. R. (2015). The management of musculoskeletal disorders in the workplace. *Best Practice & Research Clinical Rheumatology, 29*(3), 345-355.

Mason, M. (2010). Sample size and saturation in PhD studies using qualitative interviews. *Qualitative Social Research, 11*(3), 67-78.

May, T. (2016). *Social Research: Issues, Methods and Research.* New York: McGraw-Hill International.

Mody, G. M., & Brooks, P. M. (2012). Improving musculoskeletal health: global issues. *Best Practice & Research Clinical Rheumatology, 26*(2), 237-249.

Namibia Statistic Agency. (2018, June 12). *Namibia 2011 population and housing census main report: The Namibia Labour force Survey 2016 report.* Retrieved from https://nsa.org.na/page/publications

National Research Council. (2001). *Musculoskeletal disorders and the workplace: Low back and upper extremities.* Los Angel: National Academies Press.

Oakman, J., Macdonald, W., Bartram, T., Keegel, T., & Kinsman, N. (. (2018). Workplace risk management practices to prevent musculoskeletal and mental health disorders: What are the gaps? *Safety Science, 101*(2), 220-230.

Onwuegbuzie, A., & Johnson, R. (2010). Mixed Methods Research: A Research Paradigm Whose Time Has Come. *American Educational Research Association (AERA)*, 33(7), 16-34.

Palmer, K. T., & Goodson, N. (2015). Ageing, musculoskeletal health and work. *Best Practice & Research Clinical Rheumatology, 29*(5), 391-404.

Patton, M. Q. (2015). *Research Methodology and Qualitative Methods* (2nd ed.). London: SAGE Publications.

Poilt, H., Dave, T., & Huggent, T. (2014). *Research in educational psychology.* Windhoek: Zebra Publishing Company.

Prochaska, J. O. (2013). *The transtheoretical model of behaviour change. Encyclopedia of Behavioral Medicine.* New York: Springer.

Qutubuddin, S., Hebbal, N., & Kumar, T. (2013, July 19). *Ergonomic study of work-related musculoskeletal disorders risk in Indian sawmills.* Retrieved February 21, 2020, from https://www.researchgate.net/profile/Qutubuddin_S_M/publication/263654082_An_ergon

omic_study_of_work_related_musculoskeletal_disorder_risks_in_Indian_Saw_Mills/links/0deec53b6f5eabd41a000000/An-ergonomic-study-of-work-related-musculoskeletal-disorder-risk

Rayaprol, A. (2016). Redefining methodology in the social sciences. *Feminist Research, 50*(3), 368-388.

Romm, N., & Ngulube, P. (2015). Mixed methods research. *Addressing research challenges: Making headway for emerging researchers*. Retrieved April 22, 2020, from https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Romm%2C+N.%2C+%26+Ngulube%2C+P.+%282015%29.+Mixed+methods+research.+Addressing+research+challenges%3A+Making+headway+for+emerging+researchers.+&btnG=

Rugbeer, N., Neveling, N., & Sandla, T. (2016). The prevalence of work-related musculoskeletal disorders in long-distance bus drivers. *South African Journal of Sports Medicine, 28*(2), 55-58.

Santos, E., Andrade, R., Lopes, S., & Valgas, C. (2017). Prevalence of musculoskeletal pain in nursing professionals working in an orthopedic setting. *Revista Dor, 18*(4), 298-306.

Saunders, M., & Rojon, C. (2014). 'There's no madness in my method: Explaining how your research findings are built on firm foundations' Coaching. *An International Journal of Theory, Research and Practice, 7*(1), 74-83.

Soft Skill Builder. (2018). *Tips for supporting job seekers through the stage of change*. Retrieved March 25, 2020, from http://www.softskillsbuilder.com/2016/06/career-professionals-tips-for-supporting-jobseekers-through-stages-of-change.html

Sogaard, K., & Sjogaard, G. (2017). Physical activity as cause and cure of muscular pain: Evidence of underlying mechanisms. *Exercise and Sport Sciences Reviews, 45*(3), 136-147.

Storheim, K., & Zwart, J. (2014). Musculoskeletal disorders and the global burden of disease study. *BMJ Journals, 73*(6), 949-950.

Taghinejad, H., Azadi, A., Suhrabi, Z., & Sayedinia, M. (2016, February 26). *Musculoskeletal disorders and their related risk factors among Iranian nurses.* Retrieved May 30, 2020, from https://pdfs.semanticscholar.org/8d11/729f1452cea6ca155df7c5ea8922692c5764.pdf

Tanui, B. C. (2016, September 06). *Assessment of work-related musculoskeletal disorders among nurses in Mombasa County, Kenya.* Retrieved December 11, 2019, from https://www.semanticscholar.org/paper/Assessment-of-Work-Related-Musculoskeletal-among-in-Tanui/0fe2e899dc5f8940819cc1afa8a1c40b69543399

Tinubu, B., Mbada, C., Oyeyemi, A., & Fabunmi, A. (2010). Work-Related Musculoskeletal Disorders among Nurses in Ibadan, South-west Nigeria: a cross-sectional survey. *BMC musculoskeletal disorders., 11*(12), 22-30.

Ugwu, J., Agu, P., & Maduagwu, E. (2017). Need for recycling: A panacea to unemployment and economic development in Nigeria. *Policy and Dev. Studies, 11*(1), 62-69.

Wang, D., Dai, F., & Ning, X. (2015). Risk assessment of work-related musculoskeletal disorders in construction: State-of-the-art-review. *Journal of Construction Engineering and Management, 141*(6), 145-152.

Wanyonyi, N., & Frantz, J. (2015). Prevalence of work-related musculoskeletal disorder in Africa: A systematic review. *Physiotherapy Journal, 101*(1), 1604-1611.

Willmann, M., & Seeliger, G. (2017). SEBD inclusion research synthesis: a content analysis of research themes and methods in empirical studies published in the journal Emotional and Behavioural Difficulties from 1996–2014. *Emotional and Behavioural Difficulties, 22*(2), 142-161.

Woolf, A. D., & Pfleger, B. (2003). Burden of major musculoskeletal conditions. *Bulletin of the World Health Organization, 81*(9), 646-656.

World Health Organisation. (2018). *Musculoskeletal conditions*. Retrieved December 28, 2019, from http://www.who.int/mediacentre/factsheets/musculoskeletal/en/

Worldometers. (2018). *Population*. Retrieved April 23, 2020, from http://www.worldometers.info/population/

Yan, P., Li, F., Zhang, L., Yang, Y., Huang, A., Wang, Y., & Yao, H. (2017). Prevalence of work-related musculoskeletal disorders in the nurses working in hospitals of Xinjiang Uygur Autonomous Region. *Pain Research and Management, 4*(7), 166-178.

Zein, R., Halim, I., Azis, A., Saptari, A., & Kamat, R. (2015). A survey on working posture among Malaysian industrial workers. *Procedia Manufacturing, 2*(1), 450-459.

APPENDICES

APPENDIX A: INFORMED CONSENT

Dear Participant

I am **Teopolina Nakwiila Nashongo** a Master's student at the Namibia University of Science and Technology. To fulfil the requirements for my Master's, I am conducting a study titled: "**Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in the Construction and Mining Industries, North-Western Namibia"** I would like to invite you to participate in the study.

Purpose of the study

This study will elicit information which will be used to make craft strategies that will improve the WMSDs health and safety for operator drivers within the mining and construction industry.

Description of the study

I will ask you some questions about your views, opinions, perceptions and experience regarding risk factors and awareness of musculoskeletal disorders among operator drivers. this will take about 40 minutes of your time. I also would like to request you to allow me to audio-record the interview of our discussion.

Voluntary participation

Your participation is voluntary thus you are free to choose to participate or refuse to participate or stop participation at any time without penalty. You may also withdraw any time from the discussion if you wish to do so.

Possible risks or benefits

There are no risks involved in this study except for your valuable time. There are also no direct benefits or payments for participating.

Confidentiality and Anonymity

Your name and identity will not be revealed as the information you provide will be treated with strict confidential. Nobody except me will have access to it. At all times, I will keep the source of the information confidential and refer to you or your words by a pseudonym or invented name which I would like you to choose. I shall keep any other records of your participation locked away at all times, and destroy them after the research project.

Should you have any questions or clarification about this research study, please feel free to ask me. You can contact me as follows:

Cell No: +264 813532728

E-mail: ntnashongo@gmail.com

Participant's agreement:

I have read and understood this consent form and the information about the study. I voluntarily choose to participate in this research study. My signature below consents my willingness to participate in this research study.

Signed…….. Date……

APPENDIX B: QUESTIONNAIRE FOR OPERATOR DRIVERS

Number..... Date…….

Dear Respondent

This questionnaire is being undertaken for a research project on **Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia.** You are kindly requested to complete the following questions and be assured that the information from the questionnaire will only be used for academic purposes and will be treated confidentially.

Instructions

- Please do not write your name or contact details on the questionnaire, it should remain anonymous.
- Answer the question by crossing (X) the relevant block or writing down your answer in the space provided.

SECTION A

1. Age (Years) ……

2. Sex: M [ ] F [ ]

3. Marital Status: Single [ ] Married [ ]

4. Level of Education: Primary [ ] Secondary [ ] Tertiary [ ] None [ ]

5. How long have you been an operator driver (Years)? …….

6. Do you Smoke? Yes [ ] No [ ]

7. Do you consume alcohol? Yes [ ] No [ ]

8. Do you get time to do any physical activities such as fitness or other activities? Yes [ ] No [ ]

SECTION B

Do you usually engage in the following during your daily activity at work?

9. Prolong Sitting Yes [ ] No [ ]

10. Exposure to vibration Yes [ ] No [ ]

11. Sitting with back rounded or shoulder slumped forward Yes [ ] No [ ]

12. Make repetitive movements with neck and wrist Yes [ ] No [ ]

13. Holding any of the body parts in a straining position for a prolong time Yes [ ] No [ ]

14. Working in confined space Yes [ ] No [ ]

15. How many hours do you work per shift per day?

……..

16. Are you given time to rest within working hours (break, etc.)? Yes [ ] No [ ]

17. If yes, how long?

……..

18. Are you given off days to rest during the working week? Yes [ ] No [ ]

19. If yes, how many days? ……..

How would you rate the following during your driving schedules? High (Yes) & Low (No)

20. Driving hours Yes [ ] No [ ]

21. Driving fatigue/stress Yes [ ] No [ ]

22. Do you experience any dis-comfort in your daily activities? Yes [ ] No [ ]

23. If yes, what kind of dis-comfort?

……

24. Which part of the body experience the dis-comfort?

……

25. What do you do to relief from the discomfort?

……..

SECTION C

26. Are you aware of musculoskeletal disorder/conditions (MSDs)? Yes [ ] No [ ]

27. Do you know the effects of MSDs on your health? Yes [ ] No [ ]

28. If yes, mention the effects (*May give more than one answer)* ……..

……..

29. Do MSDs affect you in any way besides your heath? Yes [ ] No [ ]

30. If yes, how does it affect you? *(May give more than one answer)* ……..

……..

31. Do you know how to prevent the MSDs at work? Yes [ ] No [ ]

32. If yes, how do you prevent MSDs?

……

33. Is your organization doing something to protect you from MSDs Yes [ ] No [ ]

34. If yes, what is the organization doing to protect workers from MSDs?

(May give more than one answer) ……

……

Thank you for participating in the study

APPENDIX C: INTERVIEW GUIDE FOR MANAGERIAL STAFF

Number..... Date…….

Dear Respondent

This questionnaire is being undertaken for a research project on **Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in the North-Western Namibia.** You are kindly requested to answer the following questions and be assured that the information from the interview will only be used for academic purposes and will be treated confidentially.

Please confirm here if you are willing to participate in this study.

1. Age (Years)

2. Sex?

3. Marital Status?

4. Level of Education?

5. How long have you been a manager at this organisation?

6. Is this organisation aware of the existence of MSDs within its operator drivers?

7. If yes, what is the level of awareness?

7. Are employees given information, if yes what kind of information?

8. Are employees protected from MSDs? (Probe if the organization promotes a safe working environment in terms of MSDs)

9. Do you provide training to operator drivers concerning MSDs? (Probe for training evidence)

10. How are employees responding to the measures put in place?

11. What is the effect of MSDs on organizational performance?

12. How severe is the effect on the performance?

13. What does the organization do to minimize the effect on performance?

14. Are there any statistics on employees affected by MSDs?

15. What is the organisation doing on employees affected by MSDs?

16. What plans are put in place with regards to minimizing the occurrence and effects caused by MSDs?

Thank you for participating in the study

APPENDIX D: INTERVIEW TRANSCRIPT

INTERVIEW GUIDE FOR EMPLOYEE'S IN MANEGERIAL AND SENIOR POSITIONS

Research topic: Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia

Number: **CC1 (1)** Date: **22/05/2019**

Gender: Male

Interviewer: Thank you Sir for taking time to participate in my study, very much appreciated. The first question. How old are you and what's your marital status?

Interviewee: **No problem, just make it short and sweet. I am 49 years old and divorced.**

Interviewer: What is you level of education and for how long have you been working as a manager?

Interviewee: **I have a secondary certificate and have this position for 10 years, but worked for the organisation for 13 years, we were the first employees.**

Interviewer: Quit a long time. Is the organisation aware of the existence of MSDs amongst your operators and if yes up to what extend?

Interviewee: **There are a lot of disorders out there. But I am not so familiar with this one or maybe we not on the same page and no one said is suffering from it.**

Interviewer: Do you provide employees with information about it, if yes what kind of information and how regularly?

Interviewee: **No, we don't give them such information.**

Interviewer: Are your employees protected from MSDs within your organisation, if so how are they protected?

Interviewee: **Not specific to MSDs, but yes we provide them with safety boots and two pairs of overalls annually.**

Interviewer: Would you say you have experienced MSDs within your organisation especially that you don't have measures specifically for MSDs?

Interviewee: **No, because there is no report on that.**

Interviewer: Do you give workers an opportunity where they can openly report the challenges they experience due to work such as MSDs?

Interviewee: **Yes, yes! They are always welcome to tell us anything any time.**

Interviewer: How would you rate your operators' performance over years in general, is the performance constant or changing? And why do you think is the case?

Interviewee: **We didn't experience any change, we know the work is sometimes too much but they always deliver.**

Interviewer: Have you thought of having future plans to ensure that not even a slight back pain is experienced by your employees?

Interviewee: **Nothing, no plan.**

Interviewer: Alright, Thank you very much. **END!!!**

INTERVIEW GUIDE FOR EMPLOYEE'S IN MANEGERIAL AND SENIOR POSITIONS

Research topic: Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia

Number: **CC1 (2)** Date: **22/05/2019**

Gender: Male

Interviewer: Thank you so much sir for taking time to participate in my study, it is very much appreciated. Let's kick off with the first question. How old are you and what's your marital status?

Interviewee: **It's not a problem, we want people to study. I am 44 years of age and married to a very beautiful wife.**

Interviewer: Wooow, many are not proud as you are. Well what is you level of education and for how long have you been working here?

Interviewee: **I am old in this industry and here too, I have worked here for 10 years as a safety officer and went only up to secondary level.**

Interviewer: Considering that, you been here for quit a long time, as an organisation are you aware of the existence of MSDs amongst your operators and if yes up to what extend?

Interviewee: **Yes, I know MSDs exists but I cannot remember receiving any complaint from my operators, but I am not saying we have zero cases of MSDs amongst them because, we have people who do not for one to pick up that they are suffering from a certain illness. Just a bit of a background, about 4 years back, we had workers really complaining about not being taken good care of by the company and we decided to at least give them 2 days off to rest and also tried to provide them with kidney belts but currently struggling to keep up with the replacement every year. We all affected by the economic down fall and it has hit us so much too, which might end up contributing to the development of MSDs later if it goes on like this.**

Interviewer: Do you provide employees with information on MSDs, if yes what kind of information and how regularly?

Interviewee: **We do provide them with information but not so specific to MSDs or formal to say. We only do that whenever we are giving them kidney belts then we at least tell them that they need to use all the clothing and equipment's provided to them to prevent injuries and health problems at work.**

Interviewer: I think you have touched on this already, but well. How are your employees protected from MSDs within your organisation?

Interviewee: **Yes, I have provided answers to this one already. We give them time off that is Saturday and Sunday except few of our drivers who are involved in deliveries that work sometimes on Sunday too. We have provided them with kidney belts although like I mentioned not all of them are having belts in a good condition. The country really has no money and we are struggling too but we will make a plan for our drivers soon.**

Interviewer: How are the driver's behaviours, are they making use of the kidney belts as supposed to or not?

Interviewee: **Over 80 % do make use of their belts well, more especially the older drivers, they respect them. It's just the young ones who sometimes fail themselves, either they forgot them or other funny reasons but we always caution them.**

Interviewer: Considering that you never got any MSDs related report, would you by any chance able to tell the effects that MSDs has on the organisation performance?

Interviewee: **It's difficult for me to answer because we have not experienced MSDs yet, so it's not easy for me to link the two.**

Interviewer: Besides, what you already doing to prevent MSDs as an organisation. Do you maybe thought of other future plans to ensure that not even a slight MSDs concern is experienced by your employees?

Interviewee: **No plans, besides that we want to be replacing the kidney belts as required. I guess you can help us better since you doing a study Hahahaha! Are you just here to get information and leave us as you found us?**

Interviewer: No, I am here to help and thank you for your participation.

END!!!

INTERVIEW GUIDE FOR EMPLOYEE'S IN MANEGERIAL AND SENIOR POSITIONS

Research topic: Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia

Number: **CC2 (1)** Date: **24/07/2019**

Gender: Male

Interviewer: First I would like to thank you so much sir for taking time to participate in my study, it is very much appreciated. The first question. How old are you and what's your marital status?

Interviewee: **I am 47 years of age and married.**

Interviewer: What is you level of education and for how long have you been working here as a Senior?

Interviewee: **I ended in grade 12 and got in this industry of mining through a holiday job. I have worked here for 27 years, with 12 years as a senior.**

Interviewer: You been with the company for quit a long time. As an organisation are you aware of the existence of MSDs amongst your operators and if yes up to what extend?

Interviewee: **Yes, I know MSDs generally exists in every setting, but we do not have any report on that from our operators. We have tried to give our operators the basics such as kidney belts and weekends off, eish the economy downfall has failed us also, but I guess its helping or maybe they don't just report.**

Interviewer: Do you provide employees with information on MSDs, if yes what kind of information and how regularly?

Interviewee: **We only touch on that a little when we are giving them kidney belts. We usually tell them that the belt is given to them to protect them from kidney damages and urge them to always use them. How often? its once in a while when one is being given any protective clothing**

Interviewer: You have touched on this already somehow, but well how are your operators protected from MSDs within your organisation?

Interviewee: **Yes, I did answer this already. We have tried to protect them although not fully as supposed to be I believe because some belts need replacement. We have given them kidney belts and the weekend off as well as lunch breaks that lunch hour helps a lot. We only have few operators who work on Sunday due to the nature of their designated areas.**

Interviewer: Are the operators making use of the kidney belts as supposed to or not?

Yes, the use is satisfactory I can say. Some operators also somehow indirectly report others who are not using their belt as supposed to be to us. Saying that they need to be taken away from them and be given to those that know the use, but it's not common so I am not really bothered by the use of belts.

Interviewer: Considering that you never got any MSDs related report, would you by any chance able to tell the effects that MSDs has on the organisation performance?

Interviewee: **Eish, effects? Aa no!.**

Interviewer: In addition to what you already doing to prevent MSDs as an organisation. Do you maybe thought of other future plans to ensure that not even a slight MSDs concern is experienced by your employees?

Interviewee: **No major plans, we only want to be replace the kidney belts as required. But we just got luck, we now have you hahahaha.**

Interviewer: No worries, off course yes and thank you.

END!!!

INTERVIEW GUIDE FOR EMPLOYEE'S IN MANEGERIAL AND SENIOR POSITIONS

Research topic: Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia

Number: **CC2 (2)** Date: **24/07/2019**

Gender: Male

Interviewer: Thank you so much sir for taking time to participate in my study, it is very much appreciated. Let's kick off with the first question. How old are you and what's your marital status?

Interviewee: **It's a pleasure taking part. I am 32 years of age and I am still not committed to anyone yet.**

Interviewer: What is you level of education and for how long have you been at this position?

Interviewee: **Well, the highest grade I attended is grade 10 and been working here since I was 23 years as my first job so 9 years and just got this position 5 years back.**

Interviewer: You been here for quit a long time so, is the organisation aware of the existence of MSDs in amongst your operators and if yes up to what extend?

Interviewee: **Yes, I may say, but not so much or to highest degree. Mostly operators complain about slight back pain, which does not even stop them from working or anything.**

Interviewer: Do operators report this slight back pains or how do you get to know about their pain and is there a platform where employees can report their problems such as that?

Interviewee: **Aaah, not to report per say but as I interact with them or amongst each other's sometime, one would mention that he's having a little back pain and others share what they experience. We always tell them that should anyone not be feeling well should report to their supervisors and seek medical attention.**

Interviewer: Do you provide employees with information on MSDs, if yes what kind of information and how regularly?

Interviewee: **Aaaa, Information NO, only on first aid.**

Interviewer: Are your employees protected from MSDs within your organisation, if so how are they protected?

Interviewee: **Not anything I can remember, but we always take care of our workers, we give them clothing like overalls and we give them one hour lunch for them to rest a little.**

Interviewer: Well, beside them being provided with lunch, do you perhaps maybe also tell them about how they should be on the lookout for MSDs, even in your meetings with them or so?

Interviewee: **MSDs is not really a big problem with us just like I said at the beginning, it's just the slight back pains which even those experiencing them are not reporting.**

Interviewer: Considering that you only experience minor MSDs, did this by any chance affected the organisation performance, maybe someone had to go to the hospital and couldn't complete the work because of that? If so are there any statistics?

Interviewee: **I think I touched on that, but well not any day I can remember, so no statistics.**

Interviewer: Looking at the fact that you do not, experience nor provide the employees with information on MSDs. Do you maybe thought of having future plans to ensure that not even a slight back pain is experienced by your employees?

Interviewee: **No plans for that, but you can tell us or suggest to us what we can do maybe.**

END!!!

INTERVIEW GUIDE FOR EMPLOYEE'S IN MANEGERIAL AND SENIOR POSITIONS

Research topic: Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia

Number: **CC3 (1)** Date: **24/07/2019**

Gender: Male

Interviewer: Thank you so much sir for taking time to participate in my study, it is very much appreciated. So, how old are you and what's your marital status?

Interviewee: **You welcome, I hope this will bring us some benefits. I am 28 years of age and I am not married to anyone.**

Interviewer: What is you level of education and for how long have you been at this position?

Interviewee: **Hahaha, I have Grade 12 and worked here as a supervisor for 2 years only.**

Interviewer: Only? 2 years are sufficient enough. Is the organisation aware of the existence of MSDs in amongst your operators and if yes up to what extend?

Interviewee: **We know of MSDs but none of our employees has suffered from it or maybe they don't report them or maybe not too serious.**

Interviewer: How in your organisation do you allow the employees to openly report the challenges or illnesses they experience due to work?

Interviewee: **They are always free to tell us anything that affect them anytime they want or experience it. But our people sometimes are just not free, they will tell you all is okay while it's not the case.**

Interviewer: Do you provide employees with information on MSDs, if yes what kind of information and how regularly?

Interviewee: **Information, like lessons? aaa not specific to MSDs. We only tell them to always practice safety when making sure the job is done.**

Interviewer: Are the employees protected from MSDs within your organisation, if so how are they protected?

Interviewee: **Not for MSDs but safety in general, we always give them overalls, boots and they work 8 hours a day or sometimes more because working need to be completed on time, we have targets so no lazing around.**

Interviewer: How are they responding to the general safety measure in place? Although not specific to MSDs?

Interviewee: **Eish, those guys are difficult. Some do some don't, but we told them that should anything happen to them because of ignorance it their own fault not the organisation.**

Interviewer: Well, beside them being provided with overalls, do you perhaps maybe also tell them about how they should be on the lookout for MSDs, even in your meetings with them or so?

Interviewee: **Our operators do not experience any MSDs we know of, so nothing.**

Interviewer: From the time you joined the company, have you noticed any change in the organisation performance, maybe someone had to go to the hospital and couldn't complete the work because of that? Or something in that line?

Interviewee: **Our performance has been almost the same, its maybe only being affected by the economic downfall that the country is facing now.**

Interviewer: Looking at the fact that you do not, experience nor provide the employees with information on MSDs. Do you maybe thought of having future plans to ensure that the occurrence of MSDs remain minimal?

No plans, but its something that can be discussed further.

END!!!

INTERVIEW GUIDE FOR EMPLOYEE'S IN MANEGERIAL AND SENIOR POSITIONS

Research topic: Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia

Number: **CC3 (2)** Date: **24/07/2019**

Gender = Female

Interviewer: Thank you so much mem for your willingness to participate, it is very much appreciated. So, how old are you and what's your marital status?

Interviewee: You welcome dear, I am 42 years old and I am married.

Interviewer: What is you level of education and for how long have you been at this position?

Interviewee: I have a tertiary qualification and been holding this position for 4 years, and worked for the company for 9 years.

Interviewer: Is the organisation aware of the existence of MSDs amongst your operators and if yes up to what extend?

Interviewee: I know what it is by definition but haven't picked up a case within our people. Generally, the possibility of it being present in our company is very high though due to the nature of work that the operators do.

Interviewer: Do you provide employees with information on MSDs, if yes what kind of information and how regularly?

Interviewee: No, we don't provide them with any information.

Interviewer: Are your employees protected from MSDs within your organisation, if so how are they protected?

Interviewee: Yes, but not a big yes. We give them with kidney belts (not enough for everyone and some also need replacement), lunch break and we all don't work on Sunday so when it comes to MSDs that's really all we doing, although we are supposed to do better. Funds are really a problem especially this time in our country.

Interviewer: How the driver's behaviours towards these measures, are they making use of the kidney belts as supposed to or not?

Interviewee: Yes, they really do like 90%, just a pity for those that have old ones and those who's theirs are not replaced yet.

Interviewer: You said you haven't picked up any MSDs case amongst the operators, just wondering if you have any platform within your organisation where workers can openly report the challenges they experience due to work?

Interviewee: I may say its not a platform but rather say, we have given them the freedom to inform us of anything affecting them with regards to work, but trust me they don't mention anything year in year out. Sometimes especially during lunch you may see the talking where one can tell they are talking about something important but the moment you go closer to them then

they keep quit or change the topic completely. So really they are not open or they really don't have any problem.

Interviewer: How would you rate your operators performance over years in general, is the performance constant or changing? And why do you think is the case?

Interviewee: Performance has been constant. The only thing that may affect performance at work is when people are not committed but ours are committed and responsible enough.

Interviewer: At the beginning you mentioned that your measures toward MSDs are not really a big yes. What future plans do you have to improve on that?

Interviewee: Hahaha it's true what I said earlier, but now we got luck with you. Please advise us.

Interviewer: Alright, will surely do that.

END!!!

INTERVIEW GUIDE FOR EMPLOYEE'S IN MANEGERIAL AND SENIOR POSITIONS

Research topic: Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia

Number: **MC4 (1)** Date: **25/07/2019**

Gender= Male

Interviewer: Thank you sir for your willingness to participate, it is very much appreciated. So, how old are you and what's your marital status?

Interviewee: **You welcome, I am very young 51 years old and married.**

Interviewer: What is you level of education and for how long have you been at this position?

Interviewee: **I ended in grade 12 and been holding this position for 4 years, and worked for the company for 9 years.**

Interviewer: Is the organisation aware of the existence of MSDs amongst your operators and if yes up to what extend?

Interviewee: **We know MSDs exist, especially in mining industry but none of our operators have reported such.**

Interviewer: Do you provide employees with information on MSDs, if yes what kind of information and how regularly?

Interviewee: **No, we don't provide them with any specific information to MSDs per say but we always tell them to always use their protective gears such as kidney belts.**

Interviewer: Are your employees protected from MSDs within your organisation, if so how are they protected?

Interviewee: **Yes, we tried although very much struggling with funds to provide each and every one and to keep up with the replacement once they get old. But besides that we do lunch break and have Sundays off.**

Interviewer: How the driver's behaviours towards these measures, are they making use of the kidney belts as supposed to or not?

Interviewee: **Off course, like majority of those who have belts really do make use of their belts**

Interviewer: Just wondering if you have any platform within your organisation where workers can openly report the challenges they experience due to work?

Interviewee: **Yes, we always tell them that they are free to contact whoever they are comfortable with and talks to them about any issues affecting work, but they don't come through.**

Interviewer: How would you rate your operators performance over years in general, is the performance constant or changing? And why do you think is the case?
Interviewee: **Performance has been constant.**

Interviewer: What future plans do you have with regards to minimising the occurrence and effects of MSDs?

Interviewee: **Firstly, I really think we missing MSDs cases amongst our operators and the first thing will be to educate our people to understand the danger around them. The rest you may advise us, you the expert here.**

Interviewer: You very much right and will surely do that advice.

END!!!

INTERVIEW GUIDE FOR EMPLOYEE'S IN MANEGERIAL AND SENIOR POSITIONS

Research topic: Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia

Number: **MC4 (2)** Date: **25/07/2019**

Gender= Male

Interviewer: Thank you so much sir for taking time to participate in my study, it is very much appreciated. Let's kick off with the first question. How old are you and what's your marital status?

Interviewee: **It's a pleasure taking part. I am 29 years of age and I am still not married.**

Interviewer: What is you level of education and for how long have you been at this position?

Interviewee: **Highest grade I attended is grade 12 and been working here at this position for 4 years.**

Interviewer: Is your organisation aware of the existence of MSDs in amongst your operators and if yes up to what extend?

Interviewee: **No**

Interviewer: Have you maybe heard of an operators report some back pains or something in that line?

Interviewee: **Back pain? No. You may however see them stretching their backs but that does not mean anything. Even I stretch every time I stand up from my seat, but it does not mean I have back problems.**

Interviewer: Do you provide employees with information on MSDs like leaflets, if yes what kind of information and how regularly?

Interviewee: **We always tell them to practice safety first and tell them to always give in their best to deliver within the right time. You mentioned leaflet! even if we want them, the economy of the country is not going well so no money.**

Interviewer: Are your employees protected from MSDs within your organisation, if so how are they protected?

Interviewee: **Our workers are hardworking and we always try by all means to protect them. We give the clothing such as overalls and safety boots which we are strict about. If you don't have an overall, then no work for you.**

Interviewer: How is your Operators general performance, are they performing well or not?

Interviewee: **Performance is good, because we made sure that their performance and the hours worked determine their monthly payments. If you don't work hard then no money for you.**

Interviewer: Looking at the Do you have any future plan on MSDs to really make sure, no single occurrence will ever happen in your organisation?

Interviewee: **No plans, but you can suggest to us the most economical way and we may consider.**

Interviewer: Alright Sir, will do that and thank you very much.

END!!!

INTERVIEW GUIDE FOR EMPLOYEE'S IN MANEGERIAL AND SENIOR POSITIONS

Research topic: Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia

Number: **MC5 (1)** Date: **25/07/2019**

Gender= Male

Interviewer: Thank you so much sir for your time, it is very much appreciated. The first question is. How old are you and what's your marital status?

Interviewee: **We want people to study so its not a problem. I am 38 years of age and I married.**

Interviewer: What is you level of education and for how long have you been at this position?

Interviewee: **Highest grade I attended is grade 12 and been working here at this position for 6 years and 7 years at the company.**

Interviewer: Is your organisation aware of the existence of MSDs in amongst your operators and if yes up to what extend?

Interviewee: **No**

Interviewer: Have you maybe heard of an operators report some back pains or something in that line?

Interviewee: **No. Our people don't talk, even if we tell them to be open. They only complain about getting a lot of work and money.**

Interviewer: Just a follow up question, do you think the work load is a lot or is it reasonable?

Interviewee: **The work load is reasonable, but people will always complain and with the down fall of the economy, we need to push a bit harder in order to make good money.**

Interviewer: Do you provide employees with information on MSDs like during meetings or give them leaflets, if yes what kind of information and how regularly?

Interviewee: **Every time we tell them to put their health first and practice safety and that also include MSDs.**

Interviewer: Are your employees protected from MSDs within your organisation, if so how are they protected?

Interviewee: **Yes, we give them enough time to rest that is lunch time (1 hour) and none of our operators work on Sunday. Otherwise we also give them overalls and safety boots.**

Interviewer: How is your Operators general performance, are they performing well or not?
Interviewee: **The performance have been fine, because our operators know that if you don't deliver then no good pay and who doesn't want money?**

Interviewer: Do you have any future plan on MSDs to make sure, no single occurrence will ever happen in your organisation?

Interviewee: **No plans, but we are open for suggestions.**

Interviewer: Alright Sir, will do that and thank you very much.

END!!!

INTERVIEW GUIDE FOR EMPLOYEE'S IN MANEGERIAL AND SENIOR POSITIONS

Research topic: Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia

Number: **MC5 (2)** Date: **25/07/2019**

Gender= Female

Interviewer: Thank you Mem for taking time to participate in my study, very much appreciated. The first question. How old are you and what's your marital status?

Interviewee: **You are welcome. I am 39 years old and married.**

Interviewer: What is you level of education and for how long have you been working as a manager?

Interviewee: **I have a tertiary qualification and have this position for 4 years, but worked for the organisation for 6 years.**

Interviewer: Is the organisation aware of the existence of MSDs amongst your operators and if yes up to what extend?

Interviewee: **Yes, know what MSDs is but none of the operators has reported suffering from it.**

Interviewer: You said you know what MSDS is, do you provide employees with information about it, if yes what kind of information and how regularly?

Interviewee: **No, we don't provide them with any information about that.**

Interviewer: Are your employees protected from MSDs within your organisation, if so how are they protected?

Interviewee: **Not specific to MSDs, but yes we provide them with hard hats, safety boots and high visibility vests.**

Interviewer: Would you say you have experienced MSDs within your organisation especially that you don't have measures specifically for MSDs?

Interviewee: **I would say no, because there is no report on that.**

Interviewer: Is there any platform within your organisation where workers can openly report the challenges they experience due to work such as MSDs?

Interviewee: **Off course my lady! But the platform is for reporting anything not to say only MSDs. We always tell them to report to us anything.**

Interviewer: How is the performance of your operators? Would you rate your operators performance over years in general, is the performance constant or changing? And why do you think is the case?

Interviewee: **The performance has been good throughout; we didn't experience any change worth mentioning.**

Interviewer: Have you thought of having future plans to ensure that not even a slight back pain is experienced by your employees?

Interviewee: **Not any plan I know of, but please advise us, you know it all.**

Interviewer: Sure I will mem. Thank you very much.

END!!!

INTERVIEW GUIDE FOR EMPLOYEE'S IN MANEGERIAL AND SENIOR POSITIONS

Research topic: Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia

Number: **MC6 (1)** Date: **12/08/2019**

Gender: Male

Interviewer: Thank you so much sir for taking time to participate in my study, it is very much appreciated. The first question is. How old are you and what's your marital status?

Interviewee: **I am 26 years and very much single.**

Interviewer: What is you level of education and for how long have you been at this position?

Interviewee: **Tertiary (Bachelor's degree) and been at this position for 15 months (1 year 3 months)**

Interviewer: Is the organisation aware of the existence of MSDs amongst your operators and if yes up to what extend?

Interviewee: **I am aware of what MSDs is but haven't had any case from our operators or anybody.**

Interviewer: Do you provide employees with information or training on MSDs, if yes what kind of information and how regularly?

Interviewee: **No, we don't provide anything.**

Interviewer: Are your employees protected from MSDs within your organisation, if so how are they protected?

Interviewee: **No measures or anything to protect them. We don't experience MSDs here.**

Interviewer: Is there any platform within your organisation where workers can openly report the challenges or illnesses they experience due to work?

Interviewee: **Off course we always tell them to report anything that may affect them when at work to us, but so far nothing on MSDs.**

Interviewer: How would you rate your operators performance over years in general, is the performance constant or changing? And why do you think is the case?

Interviewee: **My dear I have no idea.**

Interviewer: Looking at it now that not reported cases of MSDs, does the organisation have any future plans to ensure that, the occurrence of MSDs remain minimal amongst the employees?

Interviewee: **None**

END!!!

INTERVIEW GUIDE FOR EMPLOYEE'S IN MANEGERIAL AND SENIOR POSITIONS

Research topic: Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia

Number: **MC6 (2)** Date: **12/08/2019**

Gender: Male

Interviewer: Thank you so much sir for taking time to participate in my study, it is very much appreciated. Let's kick off with the first question. How old are you and what's your marital status?

Interviewee: **It's a pleasure young lady, let just make it short if possible. I am 35 years old and I am married.**

Interviewer: What is you level of education and for how long have you been at this position?

Interviewee: **I have a tertiary qualification and been holding this position for 3 years, and worked for the company for 8 years.**

Interviewer: Is the organisation aware of the existence of MSDs amongst your operators and if yes up to what extend?

Interviewee: **Yes, only know what it is by definition**

Interviewer: Do you provide employees with information on MSDs, if yes what kind of information and how regularly?

Interviewee: **No, we don't provide them with any information.**

Interviewer: Are your employees protected from MSDs within your organisation, if so how are they protected?

Interviewee: **No, but we provide them with hard hats, safety boots, gloves and high visibility vests.**

Interviewer: Would you say you have experienced MSDs within your organisation?

Interviewee: **I haven't heard of anyone suffering from MSDs within the organisation yet, but I know our industry is at risk due to the nature of work involved.**

Interviewer: Is there any platform within your organisation where workers can openly report the challenges they experience due to work?

Interviewee: **Hahah openly! ja we always tell them to report to us anything, but so far no one has reported anything related to MSDs. Maybe we should start asking them during meetings specifically with regards to MSDs.**

Interviewer: How would you rate your operators performance over years in general, is the performance constant or changing? And why do you think is the case?

Interviewee: **The performance has been good throughout, we didn't experience any problem, only the two older drivers who sometimes take a day or two off to go for their usual medical**

follow ups, and since they always inform us on time we always make necessary arrangements to ensure that work is not affected. So basically the performance has been constant.

Interviewer: Just for curiosity, have you attempted to ask the two drivers as to what the follow ups are all about, just incase they are linked to MSDs

Interviewee: **Aarh, we never thought of it that way, illnesses are personal matters and you don't want to go there, not only that, you know when the person gets old then the body also weakens and so on, but one never know.**

Interviewer: Its will be good if you can find out. Ok, now that you do not, experience nor provide the employees with information on MSDs. Do you maybe thought of having future plans to ensure that not even a slight back pain is experienced by your employees?

Interviewee: **Good thing you have approached our company, just supply us with preventative measures/ safety equipment's and we will purchase them for our operators.**

END!!!

INTERVIEW GUIDE FOR EMPLOYEE'S IN MANEGERIAL AND SENIOR POSITIONS

Research topic: Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia

Number: **MC6 (3)** Date: **12/08/2019**

Gender: Male

Interviewer: Thank you so much sir for taking time to participate in my study, it is very much appreciated. Let's kick off with the first question. How old are you and what's your marital status?

Interviewee: **It's a pleasure, my age? I am 54 years old and I am divorced three times.**

Interviewer: What is you level of education and for how long have you been at this position?

Interviewee: **I only went up to grade 10 and been a supervosor for 5 years.**

Interviewer: Is the organisation aware of the existence of MSDs amongst your operators and if yes up to what extend?

Interviewee: **No, nothing**

Interviewer: Do you provide employees with information or training on MSDs, if yes what kind of information and how regularly?

Interviewee: **No, we don't provide them with any information on that. We just tell them they need to work hard, you also know how the economy is going right now we need to meet targets.**

Interviewer: Are your employees protected from MSDs within your organisation, if so how are they protected?

Interviewee: **We don't experience MSDs here, not yet so nothing but the safety is there, boots, vests, overalls and others.**

Interviewer: Is there any platform within your organisation where workers can openly report the challenges or illnesses they experience due to work?

Interviewee: **Just like other organisations, employees are always told to report anything that may affect work to us, but so far not one on MSDs.**

Interviewer: How would you rate your operators performance over years in general, is the performance constant or changing? And why do you think is the case?

Interviewee: **Operator's performance has been good, but you know employees have many problems although not MSDs. As an organisation we also uphold the performance by motivating our employees, we do braai every month.**

Interviewer: You mentioned that workers have many problems, can you mention one or to, just incase they are linked to MSDs.

Interviewee: **No, it money related and laziness.**

Interviewer: Any future plans to ensure that, the occurrence of MSDs remain minimal amongst your employees?

Interviewee: **We braai more.**

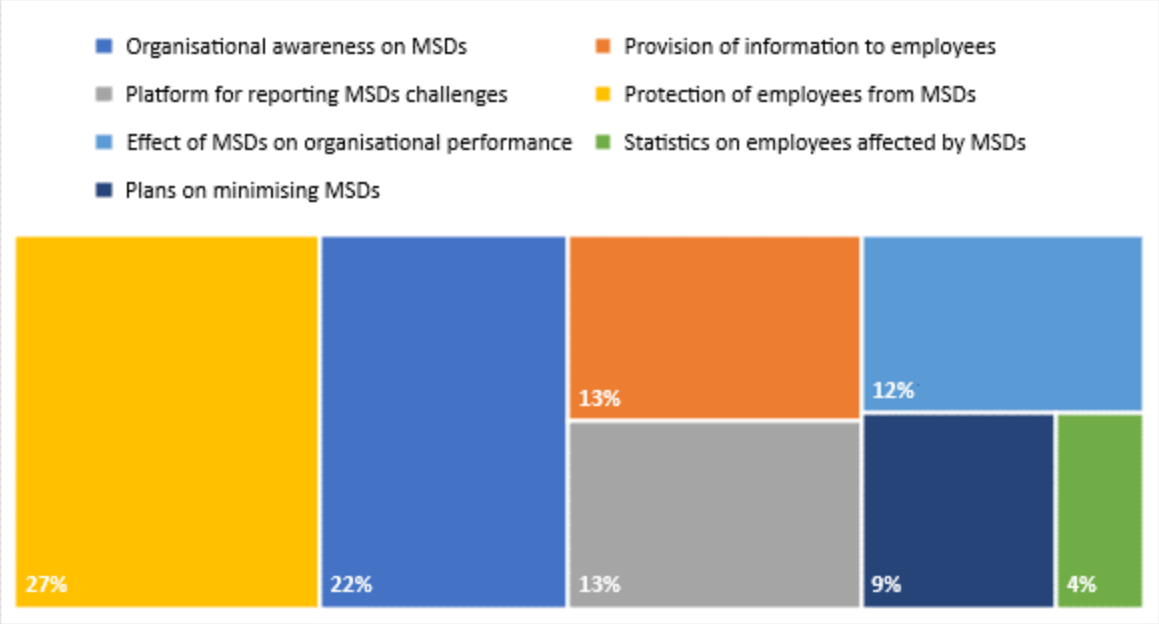
END!!!

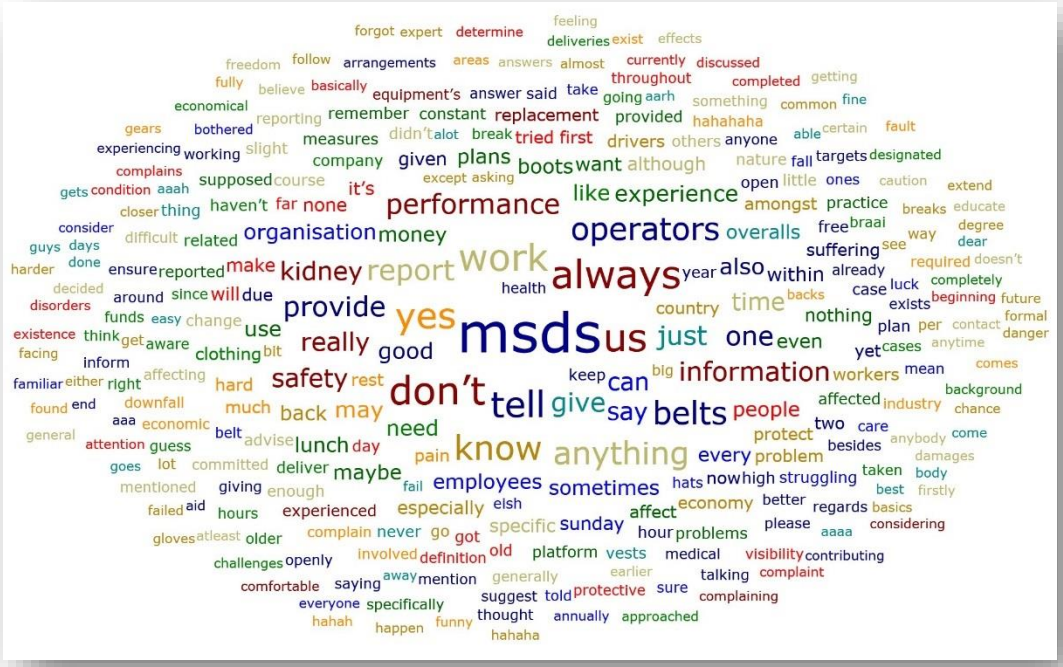
APPENDIX E: CODING

Notes on the data analysis.

The objective of the qualitative data analysis was to interpret and explain the underlying meanings in the raw data, which was provided in the form of textual transcripts. The analysis entailed searching, coding, mapping and describing patterns, themes and categories in the data. This was done with the aid of Atlas.ti version 8, a qualitative analysis program that facilitates the creation and assignment of codes to text. The descriptive statistics on the demographic profiles were run using IBM SPSS version 22.

Coding density




forgot expert determine feeling deliveries exist effects freedom follow arrangements areas answers almost currently discussed throughout completed getting fully believe basically equipment's answer said take going aarh something common fine economical reporting remember constant replacement provided hahahaha gears bothered didn't alot break tried first drivers others anyone able certain fault experiencing working slight measures company given plans boots want although nature fall targets designated complains supposed course except asking open little ones caution extend gets condition aaah it's performance like experience amongst practice breaks educate closer thing haven't far none consider difficult related organisation money operators overalls free braai degree guys days suffering see way dear harder done ensure reported make kidney report work always year also within already required doesn't decided around since will due health case luck completely disorders provide yes country time backs beginning future funds easy change nothing exists formal existence think get aware use msdsus just one even plan per contact danger facing clothing bit really good yet cases anytime inform keep can big information workers mean comes familiar either right affecting hard safety rest don't tell give say belts people affected industry background found end downfall much back may chance aaa economic belt advise lunch day need two care general attention guess pain know anything every problem protect anybody come goes lot committed deliver maybe besides damages mentioned giving enough fail employees sometimes hats now high struggling taken body failed aid hours experienced especially elsh affect economy best firstly gloves atleast older complain never go got specific sunday hour problems better regards basics please aaaa considering challenges openly involved definition old platform vests medical visibility contributing comfortable saying away mention generally earlier talking complaint everyone specifically suggest told protective sure complaining hahah happen funny thought annually approached hahaha

APPENDIX F: LANGUAGE EDITORS LETTER

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29 June 2020

To whom it may concern

LANGUAGE EDITING – TEOPOLINA NAKWIILA NASHONGO

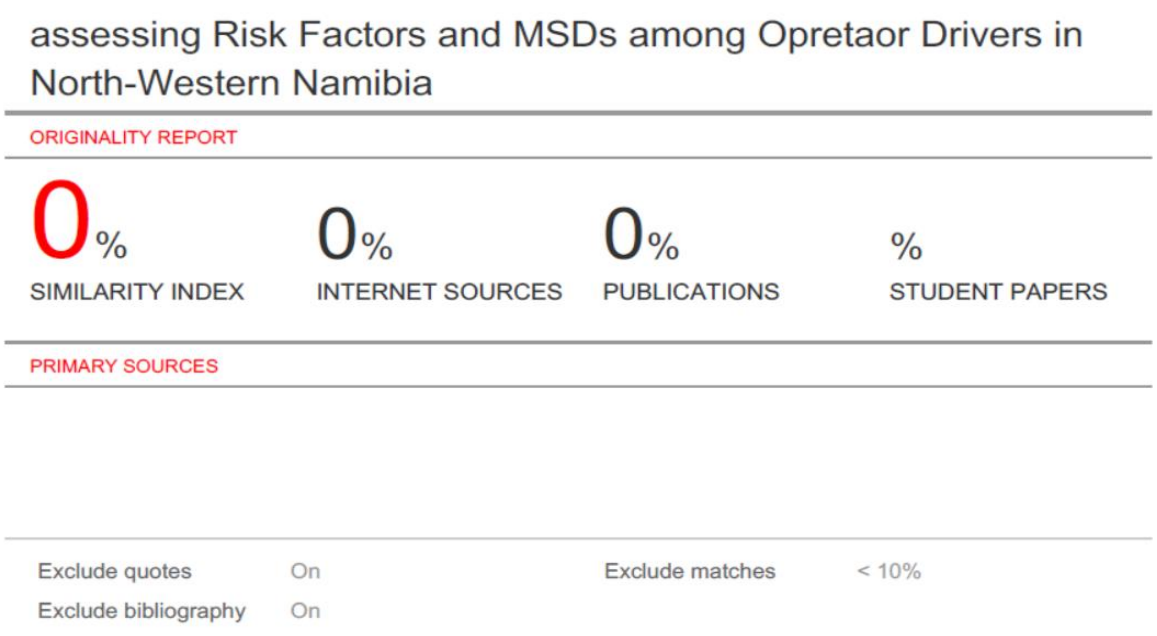
This letter serves to confirm that a Master of Health Sciences in the Faculty of Health and Applied Sciences thesis at Namibia University of Science and Technology entitled *Assessing Risk Factors and Awareness of Musculoskeletal Disorders Among Operator Drivers in North-Western Namibia* by Teopolina Nakwiila Nashongo was submitted to me for language editing.

The thesis was professionally edited and track changes and suggestions were made in the document. The research content or the author's intentions were not altered during the editing process and the author has the authority to accept or reject my suggestions.

Yours faithfully

DR NELSON MLAMBO
PhD in English
M.A. in Intercultural Communication
M.A. in English
B.A. Special Honours in English – First class
B.A. English & Linguistics

APPENDIX G: TURNITIN SIMILARITY REPORT



assessing Risk Factors and MSDs among Opretaor Drivers in North-Western Namibia

ORIGINALITY REPORT

0%	0%	0%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

Exclude quotes	On	Exclude matches	< 10%
Exclude bibliography	On		