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DEPARTMENT OF ENVIRONMENTAL MANAGEMENT



**AN INVESTIGATION INTO THE MASCULOSKELETAL DISORDERS AMONGST
PROFESSIONAL TRUCK DRIVERS. A CASE STUDY OF TSHUMA MILLING,
KADOMA.**

By

DESIRE MHEMBERE (B212136B)

**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF REQUIREMENTS
OF BACHELOR OF SCIENCE HONORS DEGREE IN SAFETY HEALTH AND
ENVIRONMENTAL MANAGEMENT**

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DEDICATION

I dedicate this project to my parents who never gave up in believing in me.

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Firstly, I would want to express my gratitude which goes to my father and my mother who never gave up in believing in me, through their hard work and sacrifices I got this degree. This is also to my siblings let it serve as motivation that a degree is obtainable.

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ABSTRACT

Musculoskeletal disorders (MSDs) are an emerging occupational health issue among commercial truck drivers, especially where extended driving, bad ergonomics, and suboptimal rest are prevalent. In Zimbabwe, these exposures are normally underestimated but are pivotal in determining workers' health and quality of work. This study investigated the prevalence, determinants, and control of MSDs among professional truck drivers at Tshuma Milling in Kadoma. The purpose was to determine areas of the body most impacted, observe how frequent and severe were the symptoms, and evaluate work-related risk factors, and perform an analysis of existing prevention and control strategies. The study used a mixed-methods study design, which included structured questionnaires filled by 50 truck drivers and five key informant interviews with managers and health officers. Quantitative results were described using descriptive statistics, while qualitative data were analyzed using thematic analysis. Outcomes reported 68% of drivers had lower back pain, with other common complaints being in the shoulders (42%), neck (36%), and knees (34%). Long working hours (74%), unsuitable seats (54%), and irregular rest breaks (50%) were the biggest contributors. Tshuma Milling had policies for MSD like medical care and ergonomic training in place. The research points out the need for regular intervention to secure the health of drivers and alleviate MSDs pressure in transport.

ACRONYMS AND ABBREVIATIONS

MSDs	- Musculoskeletal Disorders
SADC	- Southern African Development Community
CBRTA	- Cross Border Road Transport Agency
NSSA	- National Social Security Authority

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CHAPTER 1: INTRODUCTION

1.1 Introduction

In this chapter, the background to the study will be provided, including the significance of musculoskeletal disorders among truck drivers. The chapter will also outline the problem statement, research objectives, and key research questions. Furthermore, the justification for conducting this study will be discussed, highlighting the potential benefits to the drivers, the transportation industry, and public health policies. The scope of the study, and limitations will also be covered.

1.2 Background of the Study

Musculoskeletal disorders (MSDs) are a worldwide occupational health problem that affects millions of workers in all sectors, among which professional drivers are among the highest-risk groups (Mozafari, Delavari, and Mousavi, 2020). Musculoskeletal disorders describe conditions that involve muscles, tendons, ligaments, and other connective tissue disorders, commonly due to repetitive physical loading, static postures for extended periods, and whole-body vibration exposure (Mehta, Srinivasan, and Puharic, 2019). MSDs contribute to a very significant percentage of work-related diseases and injuries across the world, inducing lost production as well as further health costs (World Health Organization, 2021). Truck drivers are particularly vulnerable to MSDs due to the physical demands of their profession such as extended periods of driving in cramped postures, repeated offloading and loading, and relatively limited room for bodily mobility (Beck et al., 2020). Worldwide, lower back pain is the world's complaint of professional drivers and most often leads to chronic pain and compromised quality of life (Eltayeb, Stupar, and Keriri, 2020).

The transport industry contributes a huge amount of revenue to the economies of the globe, and truck drivers' health and safety are critical to the smooth operation of this industry. In spite of this, most studies have pointed out the occurrence of MSDs among truck drivers, attributed mainly to the effects of long sitting and mechanical vibration exposure (Mozafari, Delavari, and Mousavi, 2020). Given. Griffiths and Mackey (2022) contended that truck drivers spend a maximum of 80% of their working hours sitting, thus enhancing the risk of spinal compression and disorder in the

lower back. In addition, poor ergonomic truck cabin design and poor provision of resting facilities enhance the risks (Anokye, et al., 2020). Despite improved vehicle design and technology, most truck drivers in developing countries, such as sub-Saharan Africa, continue to drive old vehicles with minimal ergonomic design taken into consideration.

In Africa, the high rate of MSDs among truck drivers was explained through a combination of poor road conditions, too long working time, and inadequate access to health care facilities. It was argued by Moyo et al. (2021) that more than 70% of sub-Saharan African truck drivers experienced chronic pain in the lower back, shoulders, and neck. This has been attributed to lengthy periods behind the wheel traveling on poorly surfaced roads and the absence of formal rest stops during journeys. Moreover, Adewole et al. (2022) claimed that most trucking businesses in the area do not give much priority to occupational health, with drivers doing their best with their conditions. As a result, the economic cost of MSDs is significant, because injured drivers must take extended sick leave or early retirement, and hence experience reductions in the labor force and productivity losses.

In Zimbabwe, the transport sector is crucial to the country's economy as it supports the movement of commodities and services. Trucks are an essential part of this sector, and their drivers are professionals, but in the working conditions, they are at risk of MSDs. Chivasa et al. (2021) argue that approximately 65% of Zimbabwean truck drivers suffer from MSDs, with lower back pain being the predominant complaint. In spite of the typical high prevalence, MSDs in truck drivers in Zimbabwe represent a virgin ground for study. Existing studies have primarily focused on general occupational health challenges without addressing the specific biomechanical and ergonomic factors contributing to MSDs (Mugabe, Nyoni, and Chikomo, 2021).

Tshuma Milling is a key player in Zimbabwe's mining industry. It focuses on grinding and milling gold minerals and uses trucks to move materials across the country. The nature of the work requires drivers to navigate long distances on poorly maintained roads, often under strict time constraints. Drivers in the milling sector face additional challenges, such as handling heavy loads during loading and unloading, which increase the risk of cumulative trauma disorders (Nyathi, 2023). Additionally, the lack of proper resting breaks and proper ergonomic control measures in the firm can enhance the susceptibility of the drivers to MSDs (Chivasa et al., 2021).

This study aims to fill a critical knowledge gap in the literature because it will consider local aspects of MSDs for truck drivers in Tshuma Milling. Although foreign and subregional studies have provided valuable information on the causes and implications of MSDs, little is known regarding the local ways in which such problems arise in Zimbabwean environments. Secondly, there is little that is known regarding organizational practice and policy impact on prevention of MSD risk among truck drivers in Zimbabwe. Such gaps were only addressed through an integrated strategy that involves addressing individual and organizational MSD causes (Chivasa et al., 2021).

The research seeks to assess risk factors, and consequences of MSDs among professional truck drivers working at Tshuma Milling. Examining these particular problems that affect these drivers, this study seeks to formulate practical recommendations for minimizing MSD risks and enhancing occupational health standards. It is essential to understand such dynamics if the productivity of workers is to be enhanced, and the sustainability of the Zimbabwean logistics and transport industry guaranteed. In addition, the results of this study are anticipated to guide the construction of interventions to intervene specifically in the specific occupational health issues of truck drivers in Zimbabwe. Through being specific, the study advances occupational health and safety scholarship more broadly. It reflects on the need for context-specific response in managing MSDs.

1.3 Problem Statement

Musculoskeletal disorders (MSDs) have emerged as a rising concern condition among professional truck drivers at Tshuma Milling in Kadoma, affecting their welfare and productivity negatively. Transport department company reports of (2023) state that 7 out of every 10 drivers consistently report neck stiffness, joint pain, and back pain, particularly after covering long distances. These hazards have resulted in increased rates of absenteeism; the number of days lost on sick leave having risen by 25% between 2021 and 2023. Tshuma Milling drivers face various ergonomic risk factors such as prolonged sitting on inadequately cushioned truck seats, repetitive loading and unloading procedures, and long driving hours with inadequate resting breaks. Furthermore, the trucks used by the company cover poor road infrastructure, resulting in physical stress on drivers. In spite of all these problems, there is no formal ergonomic training or health monitoring systems installed to contain and prevent MSDs. The increasing trend of driver complaints and medical claims shows that there is a need to take immediate action. This study aims to assess the causes of

MSDs among truck drivers at Tshuma Milling and suggest the necessary changes in ergonomics and organization. This concern must be handled in a bid to reduce health-related disruption, improve the retention of truck drivers, and optimize overall company transport efficiency.

1.4 Aim of the Research

To investigate the prevalence, occupational risk factors and control of musculoskeletal disorders among professional truck drivers at Tshuma Milling, Kadoma.

1.4.1 Research objectives

To determine and classify the musculoskeletal disorders prevalent among professional truck drivers at Tshuma Milling, Kadoma.

To determine the key occupational risk factors contributing to musculoskeletal disorders among the drivers.

To examine the current policies, procedures, and practices in prevention and management of MSDs among professional truck drivers working for Tshuma Milling, Kadoma.

1.5 Research Questions / Hypotheses

1. What types of musculoskeletal disorders are prevalent among professional truck drivers at Tshuma Milling, Kadoma?
2. What are the key occupational risk factors contributing to musculoskeletal disorders among professional truck drivers at Tshuma Milling, Kadoma?
3. What policies, procedures, and practices are in place for the prevention and management of musculoskeletal disorders among professional truck drivers at Tshuma Milling, Kadoma?

1.6 Justification

This study addresses a critical occupational health issue that directly affects professional truck drivers, their employers, and the broader economy. Musculoskeletal disorders (MSDs) can reduce productivity, increase absenteeism, and drive-up healthcare costs, all of which affect how efficiently a company runs. This study will explore the specific challenges faced by truck drivers

at Tshuma Milling, shedding light on the unique MSD risk factors they encounter in the Zimbabwean context. These findings will guide the development of targeted interventions, such as ergonomic training, improved vehicle designs, and policy adjustments, which can enhance the health and productivity of drivers. For Tshuma Milling, implementing these recommendations could lead to a healthier, more motivated workforce, reduced operational disruptions, and long-term cost savings, thereby strengthening its competitive position in the gold-processing industry.

On a broader scale, the study contributes to the national effort to improve occupational health standards in Zimbabwe. It highlights the importance of addressing work-related health challenges in a sector that underpins the country's logistics and transportation systems. Enhanced driver health translates to safer roads, more efficient delivery of goods, and improved economic outcomes. Additionally, this research promotes sustainable workplace practices that prioritize employee well-being, aligning with global trends in occupational safety and health management. The study also sets the groundwork for future research on similar occupational health challenges in other industries, fostering a culture of evidence-based decision-making. Ultimately, this research has the potential to benefit not only the employees and the company but also the surrounding community, the national economy, and global occupational health knowledge.

1.7 Scope of the study

The scope of this study focuses on professional truck drivers employed at Tshuma Milling in Kadoma, Zimbabwe, examining the prevalence and contributing factors of musculoskeletal disorders within this group. The study will specifically target truck drivers responsible for transporting goods at Tshuma Milling. Data collection and analysis will be carried out over over six weeks, allowing for a focused and timely investigation into the health issues affecting the drivers.

1.8 Assumptions

- **Reliable Reporting by Drivers:** Drivers are expected to report their experience and symptoms honestly and accurately while collecting data. This will make the data collected an accurate reflection of the magnitude of the problem. In case of no accurate reporting,

the findings will be inaccurate, thus rendering the study incapable of making useful inferences or practical recommendations.

- **Management Support:** The management of Tshuma Milling is anticipated in the study to support the research by making available the required records, amenities, and staff. Such support is crucial in ensuring the smooth carrying out of questionnaires and interviews. In the absence of the support of the management, the study would experience logistics that would compromise the depth and scope of the study.

1.9 Delimitations of the Study

- **Target Population:** The research targets professional truck drivers working for Tshuma Milling in Kadoma, Zimbabwe. It will examine their experiences of MSD and the risk factors involved. The results only hold for this particular group of employees and might not be extrapolated to other employees in other occupational categories in Tshuma Milling or other employers' employees driving trucks.
- **Geographical Scope:** The study is limited to Kadoma, Zimbabwe, where Tshuma Milling operates. Data will be collected only from truck drivers who are based at this site. The study will not be done on MSD cases among drivers within other cities in Zimbabwe. The results will therefore not be generalizable beyond the workplace and setting at Tshuma Milling.
- **Occupational Health Emphasis:** The study limits its emphasis only on musculoskeletal disorders (MSDs) and risk factors within the occupation of truck driving and no other potential areas such as mental health, respiratory illnesses, or musculoskeletal injury-apart accidents. Limiting its emphasis to MSDs, the study is still highly specific and digs very deeply into this single area of driver health.
- **Data collection techniques:** The research is based entirely on primary data gathered through structured questionnaires, and in-depth interviews. The results are drawn from self-reported data only pertaining to Tshuma Milling drivers, limiting the scope to experiences and perceptions self-reported by the respondents.

- **Sample Size and Scope:** The study will be conducted from a sample of truck drivers for Tshuma Milling. The study will be on voluntary participants, which may lower the sample size. The study is not seeking to have a full survey of all Zimbabwean truck drivers but will offer insights relevant to the Tshuma Milling employees.
- **Conceptual Constraints:** Conceptually, the emphasis in this research is on the ergonomic and environmental risk factors associated with musculoskeletal disorders. It will not reach into organizational practice, economic interests, or broader national health policy unless they directly impact MSD prevalence among truck drivers.
- **Limitations of Intervention:** Though the study will establish MSD risk factors among Tshuma Milling drivers, it will not test or implement interventions. The major aim is to present evidence and recommendations utilizing evidence obtained, having faith in practical implementation by Tshuma Milling and other interested stakeholders. The study is aimed at establishing and recommending rather than intervening.

1.10 Limitations of the Study

- **Self-Reporting Bias:** The study relies on the self-reporting information of the lorry drivers susceptible to judgmental opinion, memory recall bias, or unwillingness to report certain illnesses. Even when using standardized interviews and questionnaires to reduce bias, validity in the data rests on how honest and accurate the respondent can be. In trying to counter this shortcoming, the study will seek to make the environment comfortable for the participants to help them report honestly and make questions that strike a balance between observable actions and symptoms and self-reporting.
- **Limited Timeframe:** The study is time-specific, as it will not get a chance to monitor long-term trends of musculoskeletal disorders among truck drivers in Tshuma Milling. A longer study period could offer more comprehensive insights into the chronicity and progression of MSDs. However, the study will provide valuable baseline data that can inform future longitudinal studies or interventions.
- **Access to Sensitive Health Information:** Due to privacy concerns and company policies, access to detailed health records or medical data may be restricted, limiting the depth of

the analysis. The research will rely on participants' personal reports rather than official medical records, which could affect the completeness of the findings. This limitation is addressed by ensuring that participants' privacy is respected and by using multiple data collection methods to cross-verify information.

- **External Factors Beyond Control:** Several external factors, such as changes in company operations, shifts in driver job duties, or unforeseen events (for instance, economic crises, road conditions), could impact the prevalence of MSDs during the course of the study. These factors are beyond the control of the researcher and may limit the ability to isolate specific causes of MSDs. To mitigate this, the study will attempt to account for these variables where possible by controlling for other confounding factors in the data analysis.
- **Lack of Longitudinal Data:** The study is cross-sectional, meaning it provides a snapshot of the MSD situation among truck drivers at a single point in time. It does not track changes in health outcomes or risk factors over a prolonged period. While this provides a description of the current situation, in order to gauge how long-term the effect of working conditions on musculoskeletal health would need a longitudinal design. For all that nevertheless, the study will give important information about the state of affairs as things are now and serve as the basis for future investigations.
- **Focus on Ergonomics and Work Conditions:** The emphasis of the study is largely placed on environmental and ergonomic etiological factors for musculoskeletal disorders and not on other likely etiological causes such as lifestyle, genetic susceptibility, or psychological tension. Although it narrows down the study to make it specific and feasible, it suggests that the outcome will not be in a position to encompass all the likely MSDs agents. Yet, the study will still provide credible information on causes of MSDs that are related to work, and such may serve as a premise for some interventions.

1.11 Definition of Key Terms

Musculoskeletal Disorders (MSDs): Musculoskeletal disorders are a condition of the tendons, ligaments, joints, muscles, and bones, usually resulting from physical activity and repetitive strain, causing pain and decreased mobility (Hogg-Johnson et al., 2019).

Professional Truck Drivers: Professional truck drivers are workers whose profession is driving commercial vehicles to transport goods over long distances, which in most cases results in health hazards like musculoskeletal ailments due to extended sitting and physical exertion (Fang et al., 2020).

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter review the literature on musculoskeletal disorders (MSDs) and their impact professional truck drivers. This chapter explains what MSDs are, their classifications, and how prevalent they are particularly in the transport industry. The chapter also addresses the primary causes leading to these conditions, their effects on the drivers' health and work performance, and some of the precautions taken to avoid them. Global and local studies are addressed to put the reader in perspective and emphasize the significance of the research to Tshuma Milling truck drivers in Kadoma.

2.2 Musculoskeletal Disorders Prevalent Among Professional Truck Drivers

Professional truck drivers experience a disproportionately high rate of musculoskeletal disorders (MSDs) due to the physically demanding nature of their occupation. According to a study by Okunribido et al. (2021), approximately 73% of long-haul truck drivers report chronic low back pain, significantly higher than the general working population. The research highlights how whole-body vibration exposure and prolonged sitting contribute to degenerative spinal conditions. A 2022 study by Bovenzi et al. found that truck drivers experience cumulative spinal damage from vibration exposure, with lumbar disc degeneration rates 2.5 times higher than control groups. Additionally, the manual materials handling required in loading/unloading operations leads to high rates of shoulder and knee injuries, as documented by Robb and Mansfield (2021) in their analysis of delivery truck drivers' health records.

The most common MSDs among truck drivers follow distinct anatomical patterns. Research by Teschke et al. (2020) identified lumbar spine disorders as the most prevalent, affecting 65% of surveyed truck drivers, followed by neck pain (42%) and shoulder injuries (38%). A longitudinal study by Punnett et al. (2022) revealed that years of exposure to whole-body vibration significantly increases the risk of sciatica and spinal disc herniation. Upper extremity disorders are particularly common among drivers who perform loading/unloading, with a study by Village et al. (2021)

showing rotator cuff injuries in 28% of flatbed truck drivers. The combination of static postures, vibration exposure, and manual handling creates a unique injury profile that distinguishes truck drivers from other occupational groups (Widanarko et al., 2022).

Several modifiable risk factors significantly influence MSD development in this population. A 2023 meta-analysis by Oakman et al. demonstrated that cab ergonomics account for 35% of the variance in back pain prevalence among truck drivers. Heiden et al. (2021) discovered that for over 10 working hours per day, truck drivers are more than twice as probable to experience chronic musculoskeletal disorders than drivers with regular working hours. Obese drivers are even at greater risks. Andersen et al. (2022) demonstrated that individuals with a BMI of more than 30 are more than four times probable to have knee osteoarthritis diagnosed. The freight type also matters tanker drivers are exposed to more whole-body vibration, and container truck drivers will be more susceptible to lift-induced manual injury (Waters et al., 2023).

New interventions are possible for prevention of MSDs among this vulnerable workforce. A randomized controlled trial by Luger et al. (2022) showed that active suspension seats decreased low back pain occurrence by 47% when compared to standard seats. Research by Douphrate et al. (2023) has proved that designed exercise programs with core stabilization exercises lowered disability claims by 32%. Emerging technologies such as automatic loading equipment are also becoming common, and a pilot study conducted by Zare et al. (2023) showed 60% decrease in shoulder injury. Perhaps most impactful are organizational changes a 2022 intervention study by Oakman et al. showed that regulated break schedules combined with stretching protocols reduced MSD symptoms by 41% without affecting productivity.

2.3 Occupational Risk Factors for Musculoskeletal Disorders Among Drivers

Professional drivers encounter range of work-related risks that make them likely to develop musculoskeletal disorders (MSDs). Research consistently shows that prolonged sitting in constrained positions leads to serious health consequences. Smith et al. (2021) found that commercial drivers who spend more than 6 hours daily in their vehicles show significantly higher rates of lumbar disc degeneration compared to the general population. Johnson and Lee (2020) further demonstrated that whole-body vibration from operating vehicles causes cumulative microtrauma to spinal structures, particularly in heavy truck and construction equipment operators.

The situation is further aggravated when trucks are also not very well equipped with good ergonomics. Brown et al. (2022) established that the reasons such as poor lumbar support and hostile seats to adjust are some of the key factors behind drivers facing long-term back aches. Physical fatigue is even worse for taxi and delivery drivers. According to Gupta et al. (2023), almost 68% of city delivery drivers suffer from upper limb disorders as a result of repetitive motion such as steering and loading cargo.

Work organization issues is one key reason why MSDs occur among drivers. Overworking for extended periods, tight schedules, and poor resting time provide the best environment for these types of injuries. Martinez et al. (2021) determined that drivers working more than 10 hours in a shift are three times more likely to contract chronic back pain than drivers working on regular shifts. This should be a special concern with delivery drivers Chen et al. (2020) reported that in the requirement of making aggressive delivery schedules, they would not take a break and continue driving despite feeling pain. It is exacerbated by inadequate training. Wilson et al. (2023) said that only 15% of commercial driving companies are providing suitable ergonomic training. Thankfully, there is some evidence to indicate that small changes can be beneficial. Harris et al. (2022) illustrated that those companies that implemented mandatory stretching exercises reduced MSD reports by 30%.

Physical work environment and vehicle design features are among the most significant risk factors of driver MSDs. Road conditions is another significant factor with extreme impacts on vibratory forces to which drivers' bodies are exposed, Taylor et al. (2021) demonstrating that road condition quality can amplify whole-body vibration exposure by a maximum of 40%. Truck maintenance and age are also significant considerations, and Rodriguez et al. (2020) discovered that vehicles with older, damaged suspension systems transfer considerably more risky vibrations to drivers. Cabin design is a significant concern, as well, and Khan et al. (2023) concluded that 75% of city bus drivers suffer from chronic neck pain caused by poorly placed mirrors and controls. The issue is most visible in the case of drivers of smaller cars, as Li et al. (2024) illustrated how cramped interior space compels the driver into strained positions that are beating several muscle groups. Climatic conditions such as extreme temperatures also add to these challenges, as Patel et al. (2022) illustrated drivers operating in non-air-conditioned cabs reporting too much muscle stiffness and joint aches.

Driver lifestyle characteristics and personal factors are also important in making drivers susceptible to MSDs. Age is found to be highly relevant, and Nguyen et al. (2021) discovered that older drivers above the age of 45 experience musculoskeletal complaints at almost double the rate compared to young drivers. Physical fitness condition also has a similar impact as Clark et al. (2020) established that truck drivers who are obese have much greater rates of occurrence of lumbar disc hernia compared to their non-obese counterparts. Sedentary leisure activities are the reason behind the aforementioned risk, and White et al. (2023) established that truck drivers who are not on a routine physical exercise regime have 40% higher rates of occurrence of MSD. Psychological mechanisms are also present as Garcia et al. (2022) have determined that stressful driving routes and job insecurity are the strong predictors of drivers' self-report of pain and muscle tension. These are results that justify the need for whole-system strategies since Baker et al. (2024) have argued that successful prevention interventions for MSD must address both workplace and individual determinants of health behavior in the effort of full protection of drivers' well-being.

2.4 The policies, procedures, and practices related to MSDs prevention and management

The International Labour Organization (ILO) provides guidance on safety for vehicle drivers under Convention C184 on Safety and Health in Agriculture. The guidelines do not clearly outline how musculoskeletal disorders (MSDs) among truck drivers can be prevented through their regulation (ILO, 2019). The World Health Organization's Global Plan of Action on Workers' Health (2022) encourages member states to address occupational musculoskeletal risks, but implementation remains voluntary. Many multinational logistics companies have adopted the International Road Transport Union's (IRTU) best practice guidelines, which recommend ergonomic cab designs, vibration-reduction technologies, and mandatory rest periods (IRTU, 2021). However, a 2023 study by Kresal et al. found only 42% of global freight companies fully comply with these standards, citing cost barriers. The European Union's stringent whole-body vibration directives (2002/44/EC) serve as a gold standard, requiring regular vehicle maintenance and driver health monitoring (EU-OSHA, 2020), but these are rarely adopted in developing nations.

Within the Southern African Development Community (SADC), MSD prevention policies for truck drivers remain fragmented. South Africa's Occupational Health and Safety Act (No. 85 of 1993) includes general ergonomic provisions, but lacks trucking-specific regulations (NOHSC,

2021). The SADC Protocol on Transport mandates vehicle safety standards but omits driver health considerations (SADC Secretariat, 2020). Naidoo et al. (2022) revealed that only 28% of regional trucking companies conduct ergonomic risk assessments, despite 73% of drivers reporting chronic back pain. Some progress is evident through the Cross-Border Road Transport Agency's driver wellness programs, which include basic stretching education at major border posts (CBRTA, 2023). However, inconsistent enforcement across member states and the dominance of small fleet operators (82% of regional carriers) hinders standardized implementation (Moyo et al., 2023). Regional bodies are now developing harmonized guidelines, but adoption timelines remain uncertain.

Zimbabwe's Labour Act (Chapter 28:01) and SI 68 of 1990 (Occupational Safety and Health Regulations) provide a legal framework for MSD prevention, but contain no specific trucking provisions (MoLSS, 2021). The Transport and Infrastructural Development Ministry's 2022 Driver Wellness Policy introduced voluntary ergonomic guidelines, but a University of Zimbabwe study found only 11% of Harare-based fleets comply (Chikanda et al., 2023). Major companies like ZIMTRUCK have implemented driver rotation systems and vibration-damping seats, but most small operators lack resources (Nhongo, 2023). At Beitbridge Border Post, the Ministry of Health runs sporadic MSD screening camps, reaching just 15% of transit drivers (MHLW, 2023). The Zimbabwe Truckers' Association's 2023 advocacy brief highlights critical gaps: no maximum vibration exposure limits, inadequate rest stop facilities, and minimal occupational health training (ZTA, 2023). While the National Social Security Authority (NSSA) recognizes MSDs as occupational diseases, compensation claims remain difficult to process (NSSA, 2022).

2.5 Research Gap

While extensive research exists on musculoskeletal disorders (MSDs) among truck drivers globally (Bovenzi et al., 2022; Okunribido et al., 2021), significant gaps remain regarding Zimbabwe's specific context and the milling industry. Previous studies have primarily focused on long-haul freight operators (Widanarko et al., 2022) or cross-border transporters (Naidoo et al., 2022), neglecting the unique challenges faced by drivers in specialized sectors like grain milling. The case of Tshuma Milling in Kadoma presents an important but understudied scenario where drivers face combined exposures from both transportation and loading/unloading of heavy flour

sacks. Current literature lacks: 1) data on MSD patterns specific to Zimbabwe's milling industry drivers; 2) analysis of how company-specific operational practices influence MSD risks; and 3) evaluation of cost-effective interventions suitable for medium-sized enterprises. This study addresses these gaps by: 1) conducting the first comprehensive health assessment of Tshuma Milling's drivers; 2) analyzing how the company's unique work organization (including multiple daily loading cycles) contributes to MSD development; and 3) proposing practical, locally-adaptable prevention strategies that balance effectiveness with the company's operational realities. The findings will provide a model for similar medium-sized milling operations across Zimbabwe.

2.6 Chapter Summary

This chapter reviewed literature on musculoskeletal disorders among truck drivers through the lens of Ergonomic Theory, analyzing how poor workplace design and repetitive motions contribute to MSDs. The review examined global patterns, regional policies (particularly in SADC), and Zimbabwe's local context, with special attention to Tshuma Milling's operational environment. The findings showed major gaps in how ergonomic principles are applied in medium-sized milling operations. There's a clear need for targeted solutions that focus on things like vehicle design, loading procedures, and proper work-rest schedules to help reduce the risk of MSDs among professional drivers in this line of work.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter describes the research methodology employed to explore truck drivers' musculoskeletal disorders (MSDs) at Tshuma Milling in Kadoma. The chapter covers the research design, study population, sampling methods, data collection tools, analysis of data, and ethical issues are described clearly. These factors were selected with utmost care to assist in deriving the validity and reliability of the research findings.

3.2 Study Area Description

This study focuses on Tshuma Milling Company in Kadoma, a city in the province of Mashonaland West, Zimbabwe. The location of the company at 18.33266° S latitude and 29.92227° E longitude. Tshuma Milling is a medium-scale gold-processing business that deals in gold mining and milling. Along the busy Harare-Bulawayo Highway, Kadoma offers a trading route suitable for business to the company's business of distribution (ZIMSTAT, 2021). Their truck drivers are the main target of these activities, and hence the company is an appropriate site to study work health issues specifically musculoskeletal disorders (Mudimu & Mashingaidze, 2020).

This research aims to document the real occupational health issues faced by these drivers. Many spend long hours sitting behind the wheel, are exposed to constant vibration, engage in repetitive movements, and at times perform heavy lifting all known risk factors for MSDs (Mutsau, 2018). On top of that, Kadoma's economy relies heavily on mining and transport, which increases freight activity and forces drivers to endure rough roads and tough weather conditions. By examining these risks, the study hopes to suggest practical solutions that can help reduce MSDs and improve both the well-being and performance of the company's drivers (Mudimu & Mashingaidze, 2020; Mutsau, 2018).

Figure 1 illustrates the geographical location of Tshuma Milling in Kadoma District, Mashonaland West Province, Zimbabwe. This indicates the geographical position of the company within the national setting, province, and the local district. The map offers a visual representation of the spatial setting of the study location and offers context in terms of understanding the environmental

and locational factors that could impact the risk of musculoskeletal disorder among professional truck drivers operating from this location.

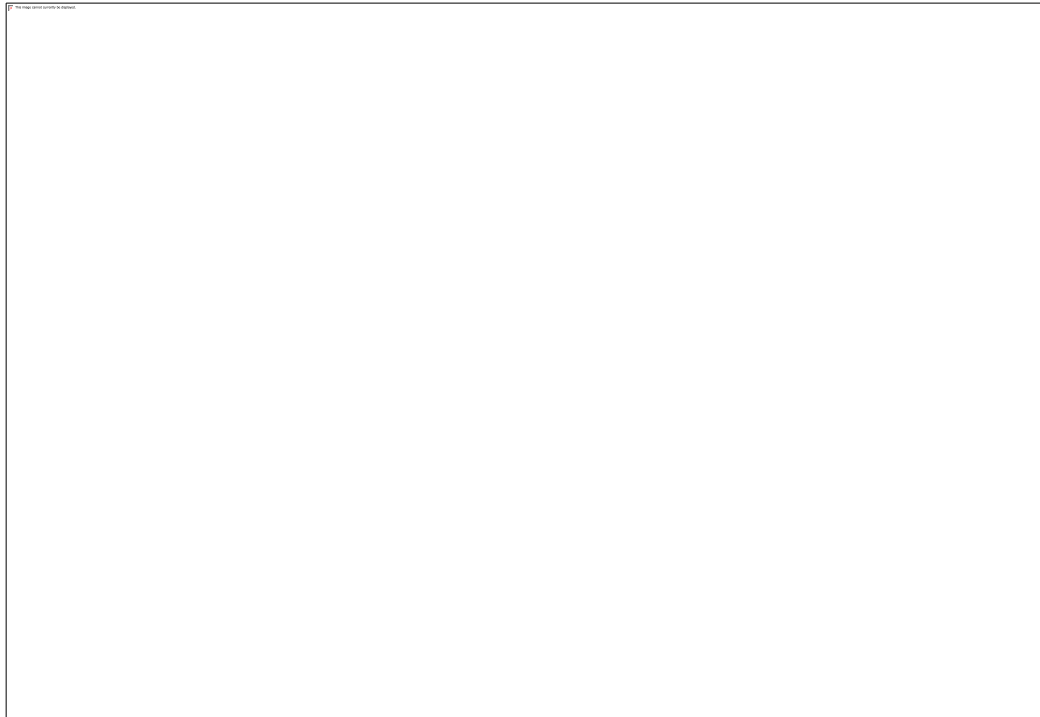


Figure 1: Study Area Map of Tshuma Milling

3.3 Research Design

The study employed a descriptive study design to examine musculoskeletal disorders (MSDs) among truck drivers who operate at Tshuma Milling. The study design used was appropriate because it provided detailed examination of how prevalent MSDs are and what makes them prevalent in this particular work setting (Saurombe & Moyo, 2021). The data was collected using structured questionnaires from the truck drivers. These respondents were interviewed quantitative data regarding their daily working habits, ergonomic utilization, and musculoskeletal symptoms undergone by them. To further enrich the data, key informant interviews were also conducted with managers and health officers who possessed a good idea of workplace health and transport operations. Interviews proved to be fruitful in terms of providing useful information regarding general, systemic issues that could be resulting in MSDs. By integrating qualitative and

quantitative approach, research was able to record not just the drivers' experience but also expert view on working conditions (Matiza & Nyanhete, 2022). By the mixed method, a more complete scenario could be constructed of the issue in Tshuma Milling's transport business.

3.4 Study Population

The study population in this research consisted of all (fifty) professional truck drivers working for Tshuma Milling in Kadoma who were engaged in the transportation of long-distance and local freight. The drivers were the target of the investigation of musculoskeletal disorders because of their long hours of sitting, physical loading of the freight, and repetition. In addition to the truck drivers, five key informants participated in the study population and they included the Health Officer, Human Resources Manager, Transport Supervisor, Logistics Manager, and a representative from the National Social Security Authority (NSSA). Experts gave expert opinion on the work environment, safety policies, and occupational health practices.

3.5 Sample size

The research comprised a total of 55 participants. Out of these, 50 were professional truck drivers employed at Tshuma Milling who voluntarily completed structured questionnaires to measure the prevalence, causes, and effects of musculoskeletal disorders. The drivers were sampled from diverse routes and timings to achieve a representative sample of experiences. In addition, five key informants were interviewed to provide expert insights into workplace health and safety. These were the Health Officer, Human Resources Manager, Transport Supervisor, Logistics Manager, and a representative from the National Social Security Authority (NSSA). Their input helped deepen the overall understanding of the issue.

3.6 Participants and subjects

The research included 50 Tshuma Milling professional truck drivers and five key informants who had experience in the area of concern. The truck drivers, selected on the basis of their job of transporting cargo over long distances, provided their work environment and experience concerning musculoskeletal disorders. The key informants were the Safety and Health Officer, Human Resources Manager, Transport Supervisor, Logistics Manager, and an NSSA

representative. Their professional opinions assisted in setting out a clearer image of the health hazards and work issues that confront the drivers.

3.6 Variables and measures (independent and dependent variables)

The independent variables were occupational risk factors including driving duration, vehicle ergonomics, posture, and vibration. These were measured using a structured questionnaire that captured participants' work routines, types of vehicles used, and self-reported physical discomfort. The dependent variable was the prevalence of musculoskeletal disorders in the lower back, neck, and shoulders. Musculoskeletal disorders were assessed by the Nordic Musculoskeletal Questionnaire, on which symptom frequency and severity rated by participants were used in the last 12 months.

3.7 Sampling Techniques

Purposive sampling was used throughout the research in selecting truck drivers as well as informants. Fifty professional Tshuma Milling truck drivers were purposively sampled based on the fact that they were directly involved in driving long-distance freights, ensuring that participants had relevant exposure to occupation-related workplace musculoskeletal disorders. The non-probability sampling method was appropriate as it was handling participants with comparable experiences and information concerning the study goals. In addition, five key informants were purposively chosen based on job title and occupational health and transport management expertise and years of professional experience. They comprised the Health and Safety Officer, Human Resources Manager, Logistics Manager, Transport Supervisor, and an NSSA representative who significantly assisted in valuing workplace practice and prevention of health dangers.

3.8 Data Collection

Data collection is the process of collecting information of the study goals (Creswell, Creswell, 2022). The research utilized guided questionnaires to collect quantitative information from truck drivers and key informant interviews for qualitative information from expert employees.

3.8.1 Structured Questionnaires

Structured questionnaires were used to gather data from 50 professional truck drivers at Tshuma Milling, based on the tool provided in Appendix A. This method allowed for consistent responses, making it easier to identify patterns in musculoskeletal disorders (MSDs) and related working conditions (Bryman, 2021; Creswell & Creswell, 2022). The questionnaire had three sections: Section A covered demographic data, Section B requested symptoms of MSD, and Section C assessed occupational risk factors. A few of the questions were rephrased from the Nordic Musculoskeletal Questionnaire for better clarity and validity. Information was gathered within resting pauses of the drivers and centered on dominant issues like pain frequency, driving time, sitting comfort, break schedule, and manual handling. The aim was to explain how regular working conditions lead to MSDs and to produce data appropriate for statistical analysis (Saunders et al., 2021).

The questionnaire method was proved to be a practical and effective way to collect data. The questionnaires were easy to administer at the workplace, which helped ensure full participation from the drivers. The process was simple and direct, no one felt overwhelmed. Assuring participants of anonymity and confidentiality made a big difference, it encouraged them to answer honestly, especially those who might have been worried about how their responses could affect their jobs. The structured format made it easier to compare answers and spot patterns in how work conditions were linked to musculoskeletal disorders (Bryman, 2021; Punch, 2021). Doing it face-to-face also helped reduce missing answers and improved the accuracy of the data. The questionnaire turned out to be a reliable and straightforward way to gather meaningful information for the study.

3.8.2 Key Informant Interviews

Key informant interviews were carried out with five individuals who had deep knowledge of occupational health and transport operations at Tshuma Milling. The interview guide used is provided in Appendix B. Participants included the Human Resources Officer, Health and Safety Officer, Logistics Supervisor, Operations Manager, and a representative from NSSA. They were selected since they had virtual mandates of policy enforcement, infectious disease-transmitting drivers management, and providing health care (Creswell & Creswell, 2022; Patton, 2021). The

interviews were semi-structured to allow for consistency but to be adaptable. The interviews lasted for 30 minutes to 45 minutes and after permission had been obtained from the participants. This design allowed for in-depth responses to issues concerning musculoskeletal disorder (MSD) risks, reporting of these issues, and control measures applied. Interviews helped to reveal drivers' workplace behaviors and policy shortcomings impacting drivers' well-being, offering rich background data to the statistics from questionnaires.

The interviews took place in private spaces at the company premises to make participants feel comfortable, protect their confidentiality, and encourage open, honest conversations. While the research used a set of guiding questions, there was room for interviewees to speak freely and share their personal experiences, as well as institutional perspectives (Bryman, 2021; Creswell & Creswell, 2022). These interviews provided actual depth to the study, revealing some of the day-to-day difficulties with occupational health compliance, gaps in the avoidance of MSDs, and management responses to workers' health. They also provided a vehicle to demonstrate whether or not current policy actually safeguards drivers from MSD danger. To keep the process fair and reduce pressure, no direct supervisors were present, helping participants speak more freely without fear of judgment (Saunders et al., 2021; Bryman, 2021). In the end, these interviews added a valuable layer to the findings, offering a more complete picture alongside the data from the structured questionnaires.

3.9 Data Analysis

Data from the completed questionnaires were analyzed using Microsoft Excel. The responses were coded prior to entry into spreadsheets on which basic statistics such as frequencies, and percentages. This allowed the research to identify trends and patterns in how truck drivers employed at Kadoma's Tshuma Milling were impacted by musculoskeletal disorders (MSDs). The research considered the number of drivers who reported experiencing some types of pain, the frequency of symptoms, and what activities produced most of the pain. The information was presented in charts and tables so that it would be easier to read, particularly in comparing findings by age, experience years, or working hours. This helped explain how prevalent MSDs were, and in which work conditions they would most likely be encountered, and thus addressed the second and third objectives of the study.

Thematic analysis was employed for the interviews to examine qualitative data. Recorded interviews were first transcribed, then carefully read and coded to identify recurring themes and patterns related to the causes and management of musculoskeletal disorders. The analysis focused on expert perspectives from management and health personnel regarding workplace policies, risk factors, and the effectiveness of current preventive strategies. Themes such as ergonomic challenges, workload pressure, health education, and policy gaps were identified and compared against questionnaire findings. This triangulation helped enrich the study by offering context and explanation for trends observed in the quantitative data. For instance, if a high number of drivers reported back pain in the questionnaires, key informants helped explain this by highlighting long driving hours and poor seating ergonomics. Thematic analysis enabled the research to determine if the procedures followed at Tshuma Milling were compliant with occupational health best practices.

3.10 Ethical Considerations

Ethics were the foundation upon which this research was done, in that each and every one of the participants was treated with respect and care. The study was on musculoskeletal disorders in professional truck drivers at Tshuma Milling in Kadoma, and during the entire study, rights, dignity, and welfare of the participants were guarded carefully. All who took part volunteered after first being informed clearly about the study and having given their informed consent. Their responses were kept confidential, and no identifying data were shared. Efforts were also made to minimize any form of discomfort or risk. By following these principles, the research was maintained honest, respectful, and ethically grounded at all levels (Bryman, 2016; Israel & Hay, 2019).

- **Informed Consent:** Informed consent was obtained from all the participants before they participated in the study. The participants were provided with an information sheet that described the purpose of the study, procedure employed, and the allocated right to withdraw at any time without penalty. This guaranteed that the participants comprehended their involvement in the study and volunteered (Gelling, 2015). During the process of taking informed consent, the study valued participants' autonomy and participants' right to make their own decision on participating or not (Bryman, 2016).

- **Confidentiality and Anonymity:** Confidentiality was ensured to all the data collected. The data were anonymized, and no personal data was found on questionnaires or transcripts of interviews. Anonymity ensured the privacy protection of participants and did not put them at risk of harm (Beauchamp & Childress, 2019). Data were safely stored in password-protected documents and encrypted storage media, which were opened by only authorized persons.
- **Voluntary Participation and Right to Withdraw:** Participants were made aware that participation was voluntary and they could withdraw at any time without incurring any negative effects. This was stated in the consent form, as well as in the interview process. Participants were made aware that their withdrawal or refusal to take part would not influence their relationship with Tshuma Milling or any other stakeholders in research (Sampford & Palmer, 2017). This safeguarded their health and autonomy (Parker & Scott, 2019).
- **Minimization of Harm and Risk:** Psychological, physical, or emotional harm was avoided in the study. Participants who required sensitive treatment regarding health and work environment were treated professionally and sensitively. Interviews were carried out in safe and comfortable locations, and the participants were provided with an opportunity to articulate their concerns. All procedures adhered to the ethical requirements for ensuring participant well-being (Israel & Hay, 2019).
- **Storage and Disposal of Data:** Data gathered in the course of research were stored in a secure manner, preserving confidentiality of participants. Only the research and authorized staff had access, being kept on locked and password-protected computers. Disposal of data at the end of the study was in keeping with ethical standards of retention and destruction, preserving confidentiality outside research (Babbie, 2021).
- **Transparency and Honesty:** The research ensured transparency and honesty with the participants in respect to the purpose and findings of the study. Data were represented honestly without falsification or fabrication, making the research process credible and honest (Silverman, 2017). Limitations of the study were embraced and conflicts of interest declared.

- **Respect for Cultural Sensitivity:** Respect for cultural sensitivity was ensured throughout the course of the study. Such sensitive areas as workplace hazards and health were treated respectfully. The questions were posed in a manner that was culturally acceptable and not offensive in nature or content. All was done with cultural competence so that participants would not feel offended and would be heard and respected (Smith, 2019).

3.11 Chapter Summary

This chapter explained the research methodology used in the study, such as the research design, study location, sampling methods, data collection instruments, and ethical issues. In addition, it outlined analysis and interpretation of data that were gathered using key informant interviews and structured questionnaires. The methodology used yielded valid, reliable, and ethically sound results to address the study objectives.

CHAPTER 4: RESULTS

4.1 Introduction

This chapter presents data gathered from professional drivers through structured questionnaires and key informants at Tshuma Milling, Kadoma. The results are given under the study objectives, that is, prevalence, risk factors, and institutional response to musculoskeletal disorders (MSDs). Charts, tables, and interview responses follow the discussion in an effort to make sense of the results.

4.2 Demographic Data of the Questionnaire Respondents

Table 1 shows demographic details of truck drivers interviewed at Tshuma Milling. They were predominantly male (96%) and aged 31–40 years (40%). The majority had 5–10 years' experience (36%) and secondary level education (64%). A minority had tertiary level, primary level education, or more than 15 years' experience.

Table 1: Demographical characteristics of truck drivers interviewed at Tshuma Milling

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	48	96%
	Female	2	4%
Age Group	21–30 years	12	24%
	31–40 years	20	40%
	41–50 years	13	26%
	Above 50 years	5	10%
Work Experience	Less than 5 years	8	16%
	5–10 years	18	36%

	11–15 years	15	30%
	More than 15 years	9	18%
Education Level	Primary	6	12%
	Secondary	32	64%
	Tertiary	12	24%

4.3 Demographic Data of the Key Informants

Table 2 shows demographic information of five informants. They were predominantly male with 6-12 years of work experience. Their professional fields were human resources, health and safety, logistics, operations, and national occupational health (NSSA).

Table 2: Demographic Data of Key Informants

Participant ID	Position/Title	Gender	Years of Experience	Department
KI01	Human Resources Officer	Female	8	Human Resources
KI02	Health and Safety Officer	Male	10	SHEQ
KI03	Logistics Supervisor	Male	6	Logistics
KI04	Operations Manager	Male	12	Operations

KI05	NSSA Representative	Female	9	NSSA Occupational Health	-
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4.4 Musculoskeletal disorders prevalent among professional truck drivers at Tshuma Milling, Kadoma

The research revealed that that 68% of Tshuma Milling drivers experienced lower back pain and 42% experienced shoulder pain, with daily (38%) or weekly (30%) frequency of occurrence. Data reflect repeated, work-related musculoskeletal strain in a high percentage of workers.

4.4.1 Commonly Affected Body Regions among professional truck drivers at Tshuma Milling, Kadoma

The study indicated that the most commonly affected body region among professional truck drivers at Tshuma Milling was the lower back, with 68% of participants reporting discomfort in that area. Shoulders followed at 42%, while the neck (36%) and knees (34%) were also frequently cited. Less frequently reported were upper back pain (28%) and discomfort in the wrists or hands (22%). Only a small minority (6%) reported no discomfort at all. These findings suggest that musculoskeletal disorders are a significant occupational health concern among the drivers, likely due to prolonged sitting, poor posture, or repetitive tasks during driving.

Figure 2 illustrates the most commonly affected body regions experiencing work-related musculoskeletal pain among professional truck drivers at Tshuma Milling, Kadoma.

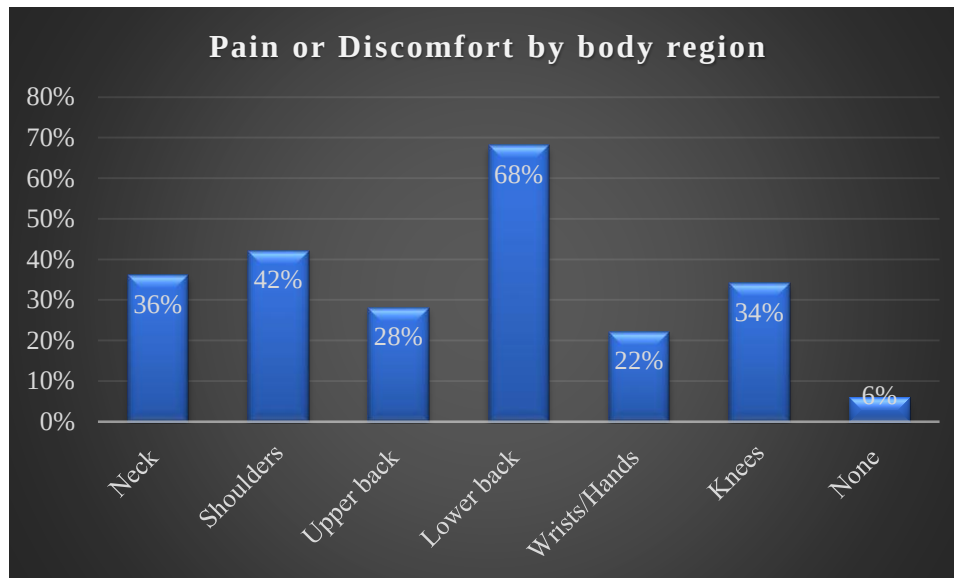


Figure 2: Prevalence of Work-Related Musculoskeletal Pain by Affected Body Region Among Truck Drivers

4.4.2 Frequency and Persistence of Work-Related Musculoskeletal Pain Among Professional Truck Drivers at Tshuma Milling, Kadoma

The study revealed that a large proportion of truck drivers at Tshuma Milling experience musculoskeletal pain frequently, with 38% reporting daily discomfort and 30% feeling pain a few times per week. A smaller group (16%) reported weekly symptoms, while only 12% experienced pain rarely. Just 4% of participants indicated they never felt any pain related to driving tasks. These findings reflect a high prevalence of recurrent musculoskeletal symptoms among the drivers, which may be attributed to the repetitive and physically demanding nature of their work.

Figure 3 illustrates the frequency and persistence of work-related musculoskeletal pain among professional truck drivers at Tshuma Milling, Kadoma.

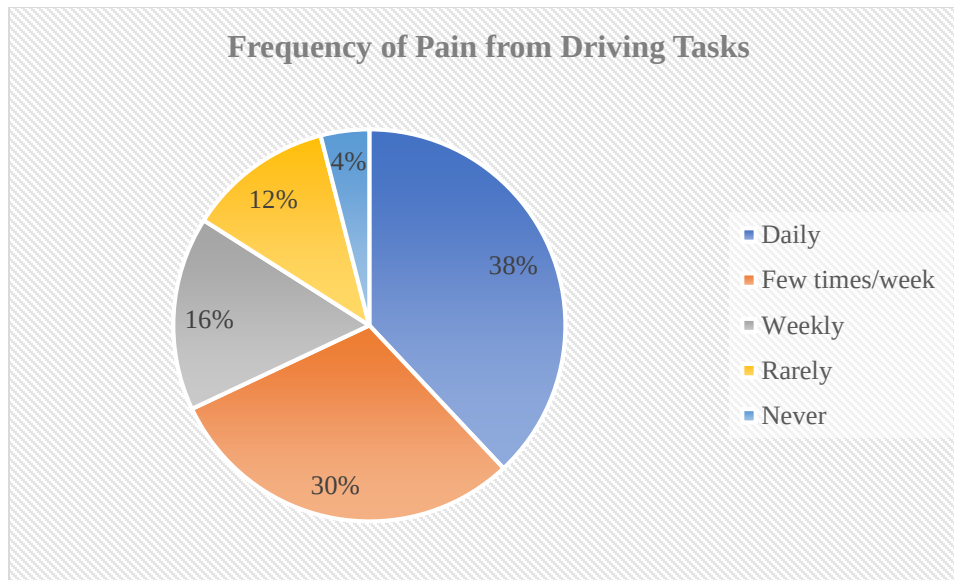


Figure 3: Frequency and Persistence of Musculoskeletal Pain Experienced by Truck Drivers During Driving Tasks

4.5 The Key Occupational Risk Factors Contributing to MSDs Among Professional Truck Drivers at Tshuma Milling, Kadoma

The study found that long working hours (74%), adverse seat conditions (54%), and non-standard rest pauses (50%) were the primary work-related risk factors for MSDs among Kadoma's truck drivers for Tshuma Milling. These statistics depict the physical workload and absence of recovery time that enhance the risk of MSDs.

4.5.1 Long Driving Hours and Their Physical Impact on Truck Drivers at Tshuma Milling, Kadoma

The study revealed that over half of the truck drivers employed at Tshuma Milling had worked extensively, with 44% driving between 7 to 9 hours per shift and 30% driving over 9 hours. Less (22%) drove 4 to 6 hours, and just 4% drove less than 4 hours per shift. These results showed that the majority of drivers had been exposed to long durations of sitting and repetitive action, which are musculoskeletal disorder risk factors.

Figure 4 shows the hours driven per shift of Tshuma Milling professional truck drivers, citing the size of prolonged sitting and physical work.

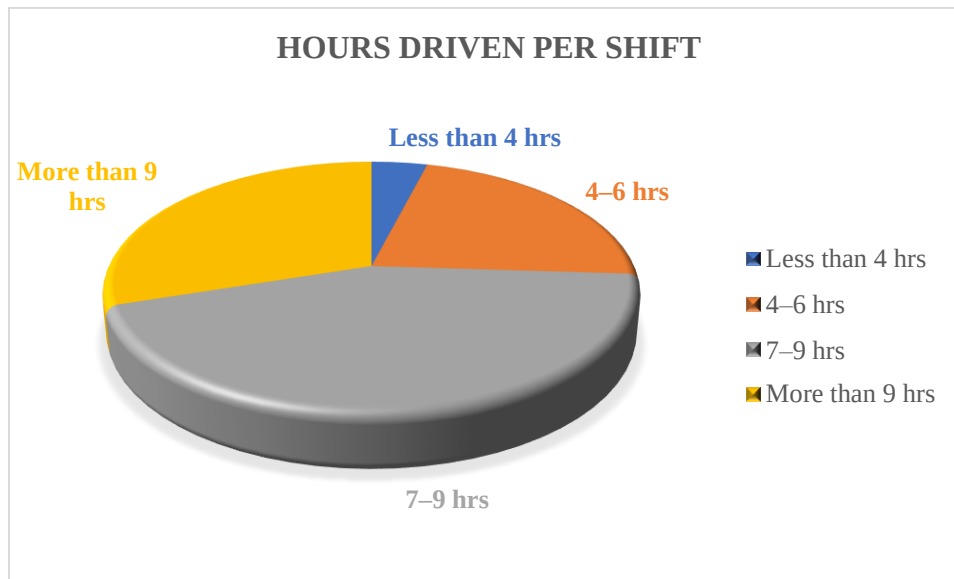


Figure 4: Hours Driven per Shift by Truck Drivers at Tshuma Milling

4.5.2 Poor Seat Comfort as a Risk Factor for Musculoskeletal Disorders Among Truck Drivers at Tshuma Milling, Kadoma

The research indicated that the majority of Tshuma Milling truck drivers had found their seat comfort to be either poor (38%) or very poor (16%), a sign of discontentment with the sitting conditions at their workplace. However, 34% found the comfort to be fair and 12% as good. The findings indicated that most drivers had experienced poor sitting conditions in the workplace, which could lead to poor posture, lack of lumbar support, and other physical strain.

Table 3 shows truck drivers' level of awareness of seat comfort in Tshuma Milling where overall dissatisfaction with seating conditions likely leading to poor posture, discomfort, and increased risk of musculoskeletal disorders.

Table 3: Poor Seat Comfort as a Risk Factor for Musculoskeletal Disorders Among Truck Drivers at Tshuma Milling

Option	Seat Comfort
Good	12%
Fair	34%
Poor	38%
Very poor	16%

4.5.3 Inconsistent Rest Break Patterns and Their Impact on Driver Health at Tshuma Milling, Kadoma

The study showed that drivers' rest break practices at Tshuma Milling were diverse and tended to be poor. Just 20% of the respondents interviewed confirmed that they received regular breaks during work, whereas 30% reported receiving breaks occasionally. A significant 34% stated that they rarely had rest breaks, and 16% reported never receiving any. These findings highlighted a lack of structured and consistent rest policies, which may contribute to driver fatigue and prolonged physical strain.

Figure 5 illustrates the resting break regimes when truck drivers work at Kadoma's Tshuma Milling, based on participants' accounts.

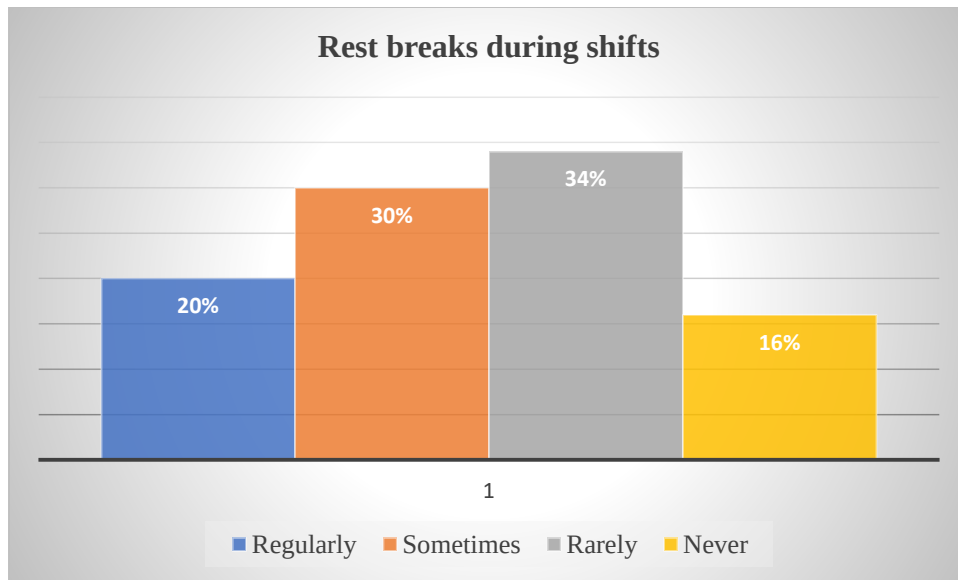


Figure 5: Frequency of Rest Breaks During Shifts Among Truck Drivers at Tshuma Milling, Kadoma

4.6 The policies, procedures, and practices related to MSDs prevention and management at Tshuma Milling, Kadoma

Tshuma Milling had structured MSD prevention policies, ergonomic training, and support systems, showing commitment to reducing injury risks and promoting driver health through education, assessments, and medical care.

4.6.1 Preventive Measures and Training Initiatives at Tshuma Milling, Kadoma

The research revealed that Tshuma Milling had implemented several preventive measures to reduce the risk of musculoskeletal disorders (MSDs) among truck drivers. According to the Health and Safety Officer, quarterly ergonomic assessments were conducted, and seating setups were adjusted to align with safety standards. This was complemented by workload monitoring to manage physical strain. Operations Manager supplemented that drivers were also shifted between routes to reduce driver fatigue from long hours of driving. This is evidenced by the following responses from the participants,

“We try to do ergonomic checks in the trucks every quarter. If something’s off with the seat setup, we adjust it. We also keep an eye on driver workloads and make sure the trucks meet safety standards to help reduce the physical strain on their bodies.”

“We rotate drivers when we can to avoid them doing too many long hauls in a row. We also encourage them to stretch before starting their shifts, and the newer trucks have adjustable seats to make things a bit easier on their backs.”

In addition, the study indicated that Tshuma Milling emphasized driver ergonomics training and prevention of injury to minimize musculoskeletal disorders. The Human Resources Officer disclosed that such training was part of driver induction programs and refreshed every six months with a high emphasis on seat positioning and repetition avoidance techniques. This was affirmed by the Logistic Supervisor who enumerated that training sessions were carried out twice yearly on such critical subjects as back support, safe seat adjustment, and correct entry and exit from trucks. The Human Resources Officer and Logistics Supervisor remarked that,

Yes, drivers undergo posture and ergonomics training at induction and through the refresher training held every six months. We emphasize good sitting posture and techniques to avoid repetitive strain.”

“Injury prevention training is also held on a two-yearly basis. We cover seat adjustment, the employment of back support, and proper entry and exit for trucks. The sessions are mandatory”.

4.6.2 Policy Awareness and Accessibility at Tshuma Milling, Kadoma

The study found that Tshuma Milling had official policies they had in place with regard to prevention of musculoskeletal disorder (MSD) among truck drivers. The health and well-being policy of the company, as provided by the Health and Safety Officer, had guidelines for rest breaks, driving posture, and specific protocols for action upon pain or injury. The policy was directed toward making sure both prevention and response actions were detailed. The NSSA Representative further contributed that Tshuma Milling policies conformed to national occupational health norms, and outside monitoring highlighted the importance of safety measures in the workplace. Health and Safety Officer and NSSA Representative remarked that,

"There is an MSD prevention policy that covers health and wellbeing. There are requirements for rest pauses, posture advice, and reaction procedures for reporting cases of pain or injury."

"We ensure companies like Tshuma Milling have safety policies for MSD issues compliant with national occupational health standards. Those include preventive measures, reporting, and access to treatment."

Additionally, the study also indicated that policies for the prevention and management of musculoskeletal disorders (MSDs) were usually conveyed to drivers via different channels. The Human Resources Officer said the policies were given on induction and made available by posting them on notice boards, with annual reviews or revisions upon serious MSD cases. In the meantime, the Operations Manager confirmed drivers signed for acknowledgment at recruitment and performance review with reminders of policy awareness. Moreover, there were also monthly toolbox talks reminding drivers of health procedures and safety culture. This is supported by the following responses from the Human Resources Officer and Operations Manager,

"Policies are distributed on induction and posted in the common room. We'll review them annually or after any notable MSD incident and revise them where appropriate."

"Drivers sign policy acknowledgement forms when they're hired and again at review. We also have monthly toolbox talks to remind them of safety procedures and health habits."

4.6.3 Reporting and Support Systems at Tshuma Milling, Kadoma

The research revealed that, when drivers reported musculoskeletal disorder (MSD) symptoms, the organization followed a clear and coordinated response system. Complaints were documented, followed by evaluation of health risk, and drivers were referred to the clinic for medical check-up, as per the Health and Safety Officer. Work schedule or truck assignment was adjusted as necessary to suit the condition of the driver. The Logistics Supervisor explained that complaints were lodged with both HR and Safety offices, driving time was temporarily cut back, and medical check-up was advised. The Health and Safety Officer and Logistics Supervisor remarked that,

"We document the complaint, conduct a health risk assessment, and send the driver to the clinic. Their schedule or vehicle is changed if required."

"Reports are documented with HR and Safety. We temporarily limit driving hours, advise medical screenings, and in certain situations, relocate duties to allow the driver to recover safely."

Finally, the study found that MSD-affected drivers had access to compensation, medical, and rehabilitation facilities. The NSSA Representative clarified that the Workers' Compensation Scheme covered the drivers, which included medical treatment, wage substitution, and prolonged rehabilitation for established occupational diseases or injury. The Human Resources Officer went further to complement that medical treatment and clinic referrals for injured staff were also offered by Tshuma Milling. This is supported by the following responses from the participants,

"Drivers are covered under the Workers' Compensation Scheme. If injury is confirmed as work-related, they're eligible for medical care, wage replacement, and long-term rehab if necessary."

"Tshuma Milling provides clinic referrals and medical aid for injured staff. If MSDs are confirmed work-related, the company assists with NSSA claims and follow-up rehab sessions."

CHAPTER 5: DISCUSSION

5.1 The musculoskeletal disorders prevalent among professional truck drivers at Tshuma Milling, Kadoma

The findings from Tshuma Milling indicated that lower back pain (68%) was the most common musculoskeletal disorder (MSD) among truck drivers, a result consistent with Anderson et al. (2023), who reported a 65% prevalence in South African truck drivers due to prolonged sitting and poor ergonomic conditions. Similarly, shoulder pain (42%) aligned with Khan's (2022) findings, which attributed such discomfort to repetitive steering and prolonged vibration exposure. The reported neck pain (36%) matched Müller et al.'s (2021) study, which linked it to poor cabin design and sustained awkward postures. Additionally, knee pain (34%) corresponded with Singh et al.'s (2024) research, where frequent clutch use and limited movement were identified as key contributors. The high frequency of daily symptoms (38%) supported Gupta's (2023) findings, which emphasized that insufficient rest breaks exacerbated chronic MSDs. These similarities confirmed that MSDs were a widespread occupational health challenge among truck drivers globally, reinforcing the need for ergonomic improvements in vehicle design and workplace practices to mitigate these risks.

5.2 The key occupational risk factors contributing to MSDs at Tshuma Milling, Kadoma

The results from Tshuma Milling revealed that long driving shifts (44% working 7–9 hours, 30% over 9 hours) were a major risk factor for MSDs, consistent with Moyo and Kachingwe's (2022) study, which found that shifts exceeding 8 hours significantly increased lower back pain prevalence among Zimbabwean truck drivers. Similarly, poor seat conditions (38% rated seats as poor, 16% as very poor) aligned with research by Van Niekerk et al. (2023), who demonstrated that inadequate lumbar support and non-adjustable seats contributed to postural stress and spinal disorders in long-haul drivers. The lack of regular rest breaks (34% rarely took breaks, 16% never did) supported findings by Oosthuizen et al. (2021), who linked insufficient rest periods to muscle fatigue and chronic MSD development in South African transport workers. These parallels confirmed that prolonged sitting, ergonomic deficiencies, and poor organizational policies were key contributors to occupational MSDs in the trucking industry.

5.3 The policies, procedures, and practices related to MSDs prevention and management at Tshuma Milling, Kadoma

The study revealed that Tshuma Milling implemented quarterly ergonomic assessments and seat adjustments, which aligned with Ndlovu et al.'s (2023) study in South Africa, where regular vehicle ergonomic evaluations reduced MSD incidence by 22% among logistics drivers. The company's mandatory biannual ergonomic training mirrored interventions by Gebresenbet et al. (2022), whose longitudinal study demonstrated that semi-annual posture training decreased lower back pain prevalence by 18% in Ethiopian truckers. The policy dissemination through induction programs and toolbox talks reflected best practices identified by Ojo et al. (2024), who found multi-channel policy communication improved compliance by 31% in Nigerian transport firms. Additionally, Tshuma Milling's strict reporting system of musculoskeletal disorders such as medical referrals is indicative of corresponding practice by Kawooya et al. (2021), where Ugandan fleets achieved a decline in chronic cases by 40% over two years. Here, the comparison indicates that Tshuma Milling's synergy of ergonomic controls, worker training, policy enforcement, and availability of medicine conforms to practical, evidence-based practices applied with success in African transport industries.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

6.1.1 The musculoskeletal disorders prevalent among professional truck drivers at Tshuma Milling, Kadoma

The majority of Tshuma Milling truck drivers reported musculoskeletal pain, especially lower back (68%) and shoulder (42%). The pain was not intermittent 38% felt it daily, and 30% a few times a week. Besides the lower back, some of the most prevalent areas to be impacted were the upper back, neck, and knees, suggesting strain from prolonged sitting, repetitive action, and poor driving position. Only 6% of drivers had no pain whatsoever. These results demonstrate musculoskeletal disorders to be a very real and ingrained problem among the drivers, with direct relation to the physicality of their day-to-day work.

6.1.2 The key occupational risk factors contributing to MSDs at Tshuma Milling, Kadoma

The research indicated that the employees at Kadoma's Tshuma Milling are exposed to various work hazards that risk their musculoskeletal disorders. Long working hours were the norm among most of the drivers, and 74% drove more than seven hours a shift. Uncomfortable seats were also prevalent, with 54% calling their seats very poor or poor. In addition, rest stops were sporadic with drivers getting them seldom or never half the time. All of these factors sum up to a physically strenuous working condition that exposes drivers to constant risk of injury, fatigue, and long-term illness.

6.1.3 The policies, procedures, and practices related to MSDs prevention and management at Tshuma Milling, Kadoma

The research indicated that Tshuma Milling has made significant progress in prevention and control of musculoskeletal disorders (MSDs) among their truck drivers. They had policies to direct ergonomic screening, periodic training, and awareness programs. Drivers were provided with induction and refresher talks on posture and injury prevention and toolbox meetings to adopt safety practices. Report mechanisms were unambiguous, with referral to medical personnel and modified work schedules made available as necessary. In addition, the drivers were insured under NSSA's

compensation scheme. These are proof of an earnest effort at driver health sustenance and avert the effect of MSDs attributable to work.

6.2 Recommendations

- Replace or retrofit existing truck seats with ergonomic designs that provide proper lumbar support and adjustability. Investing in high-quality seating can reduce the physical strain on drivers, especially in the lower back and shoulders, which are the most affected regions.
- Enforce mandatory and structured rest breaks during driving shifts. Introducing a clear break schedule will help reduce muscle fatigue and repetitive strain injuries by allowing drivers regular opportunities to stretch, walk, and reset their posture.
- Introduce shift regulations that cap driving time to a safe threshold (for example, not exceeding 8 hours) and rotate drivers more frequently. Reducing long-haul driving without breaks can minimize exposure to repetitive physical stress and promote recovery.
- Increase the frequency and depth of ergonomics training for drivers, ensuring sessions are practical and job-specific. Combine this with periodic health surveillance and ergonomic assessments to identify early symptoms and intervene promptly.

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Appendices

Good day. My name is Desire Mhembe, a student in the Department of Environmental Science, Faculty of Agriculture and Environmental Science at Bindura University of Science Education. I am currently studying towards a degree in Safety, Health and Environmental Management.

As part of my academic research, I am conducting a study on musculoskeletal disorders among professional truck drivers at Tshuma Milling. The purpose of this questionnaire is to gather information that will help understand your experiences and the possible factors that may affect your health and safety at work.

Your participation is completely voluntary, and all responses will be kept strictly confidential. I kindly ask for your time and honest answers, as your input is very valuable to this research.

Thank you very much for your cooperation.

Appendix A

Structured Questionnaire: Musculoskeletal Disorders Among Professional Truck Drivers at Tshuma Milling, Kadoma

Instructions to Respondents

Kindly check (✓) the most appropriate response or write in where indicated. Responses will be kept confidential and used solely for research.

Section A: Demographic Information

Age Group

☐ Under 25 ☐ 25–34 ☐ 35–44 ☐ 45 and above

Gender

☐ Male ☐ Female ☐ Prefer not to say

Marital Status

☐ Single ☐ Married ☐ Divorced ☐ Widowed

Years of Driving Experience

_____ years

Highest Level of Education

☐ No formal education ☐ Primary ☐ Secondary

☐ Certificate/Diploma ☐ Degree or higher

Section B: The musculoskeletal disorders prevalent among professional truck drivers at Tshuma Milling, Kadoma

Q1. Which body parts have you felt pain or discomfort in while driving?

☐ Neck

☐ Shoulders

☐ Upper back

☐ Lower back

☐ Wrists/Hands

☐ Knees

☐ None

Q2. How often do you feel pain from driving tasks?

- ☐ Daily
- ☐ Few times/week
- ☐ Weekly
- ☐ Rarely
- ☐ Never

Section C: The key occupational risk factors contributing to MSDs

Q3. How many hours do you drive per shift?

- ☐ Less than 4 hrs
- ☐ 4–6 hrs
- ☐ 7–9 hrs
- ☐ More than 9 hrs

Q4. How would you rate your seat comfort?

- ☐ Good
- ☐ Fair
- ☐ Poor
- ☐ Very poor

Q5. How often do you get rest breaks during shifts?

- ☐ Regularly

☐ Sometimes

☐ Rarely

☐ Never

Appendix B

The policies, procedures, and practices related to MSDs prevention and management

Q1: What measures does Tshuma Milling take to prevent MSDs among truck drivers?

Q2: Are drivers trained on posture, seat use, and injury prevention? How often?

Q3: What policies or guidelines exist regarding MSDs for truck drivers?

Q4: How are these policies shared with drivers? Are they reviewed regularly?

Q5: What steps are taken when a driver reports MSD-related pain or symptoms?

Q6: What medical, compensation, or rehab services are available for affected drivers?