THE RELATIONSHIP BETWEEN PAIN ATTITUDES AND BELIEFS, ABSENTEEISM AND HEALTH-RELATED QUALITY OF LIFE OF WORKERS WITH MUSCULOSKELETAL DISORDERS: A MIXED-METHODS STUDY

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KEYWORDS

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Health-related quality of life

Workers

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ABSTRACT

Absenteeism from work due to sick leave is a global phenomenon and has cost economies billions of dollars. In South Africa alone, the economy loses between 12-16 billion Rands annually because of productivity loss due to absenteeism. The national absenteeism rate on any given day can be as high as 15%, with 40% having no diagnosis. Pain is a common experience and results in impairments in meaningful life roles such as family, leisure and work. Workers are the essence of human capital, and reduced work participation due to painful conditions directly affects the economy. Pain is debilitating to any individual who does not understand it or how to control it. Thus, the present study aimed to determine workers' pain attitudes and beliefs, their correlation with absenteeism rate from work and health-related quality of life. The study implemented a sequential explanatory mixed-method approach using a descriptive cross-sectional and exploratory design for the quantitative and qualitative phases. A valid, reliable questionnaire comprised of 3 sections was employed to determine the pain attitudes and beliefs and correlation with absenteeism in the employed population consisting of a sample 110 workers who are experiencing a painful condition in the Mbombela Municipality of Mpumalanga, South Africa. Section A consisted of sociodemographic information; Section B consisted of the EQ-5D-5L and section C, the Survey of Pain Attitudes-Revised (SOPA-R). A convenience sampling strategy was employed, where 110 participants were recruited for the study. The participants were recruited from five private physiotherapy practices in the Mbombela Municipality who were invited to participate in this study. A face-to-face interview guide was used during the qualitative phase on a purposively selected sample of participants. Descriptive statistics were employed to summarise the sociodemographic information of the participants, expressed as percentages, means and standard deviation and were presented in frequency tables, charts and graphs. Inferential statistics were used to determine any association between variables (Chi-square and t-tests). Statistical significance was set at

$p<0.05$. Qualitative data were transcribed verbatim, after which coding, categorisation and identification of themes were performed. Trustworthiness was addressed by implementing steps that ensure the data's dependability, credibility, transferability and confirmability. Ethical clearance and permissions were obtained and this study was conducted according to the ethics principles outlined in the Helsinki declaration of ethical principles for medical research involving human subjects.

The participants ($n = 110$) represented a variety of occupational categories relating mining, forestry, security, information technology, agriculture, public safety, healthcare, education and various municipal and state entities. The participants of the study presented a variety of musculoskeletal disorders (MSDs) from head/neck (11.8%), upper limb (20.9%), spine and pelvis (25.5%), lower limb (41.8%) and a combined total of over 800 workdays lost. Most participants experienced difficulty in their HRQoL except for self-care (42.7%) with a mean health scale score of 69.68. Most participants scored within the clinical and sub-clinical range for adaptive and maladaptive pain beliefs with Emotion (50.2%), Disability (79%), Medication (58.2%) and Solicitude (66.9%). There was a majority score within the normal range within the beliefs of Control (53%), Harm (62.7%) and Medical Cure (63.4%). There was a significant association between HRQoL and the pain attitudes and beliefs of Emotion ($p = <0.001$), Harm ($p = 0.034$), Solicitude ($p = 0.002$) and Medication ($p = 0.003$). The association between the participant's view of their overall health measured on a health scale and all pain attitudes and beliefs were found to be significant. A significant correlation was found between absenteeism from work and pain beliefs regarding Emotion ($p = 0.006$), Medication ($p = 0.005$) and Solicitude ($p = 0.002$), with a causal relationship determined by whether the MSD was developed from an injury on duty (IOD). The exploration of worker experiences of managing pain attributed to MSDs identified five main themes. Highlighting the presence of pain attitudes and beliefs demonstrates how beliefs are intwined are entwined with the experience of MSDs.

Psychosocial determinants of pain brings attention to the validity of the individual and not just their biology. Healthcare Professional and the worker relationship shows the relevance of the professional relationship to recovery from MSDs. Assessment and treatment MSDs display the treatments workers experienced and its accuracy to the contemporary understanding of pain. The worker is always right, addresses the workers experience with MSDs and the relevance of their understanding and responses to treatment affected their recovery. Pain attitudes and beliefs are ubiquitous within MSDs and those beliefs are being perpetuated by healthcare professionals (HCPs) with the potential to facilitate or inhibit recovery from MSDs. The approach to MSDs is predominantly biomedical, demonstrating adverse effects on the worker through assessments, treatments and delayed return-to-work (RTW). Workers seek more communication and understanding of their MSDs where they have an active role in their recovery. A collective endeavour at all healthcare system levels can prevent absenteeism from MSDs and its detrimental effects on worker health and well-being by adopting a person-centred approach enacted by the Biopsychosocial (BPS) model of health.

DECLARATION

I hereby declare that "The relationship between pain attitudes and beliefs, absenteeism and health-related quality of life of workers with musculoskeletal disorders: a mixed methods study" is my own work and has not been submitted for examination of any degree at any university. All the sources I have used and quoted have thus been indicated and acknowledged through a reference list. Finally, this work has been prepared in accordance with the guidelines of the University of the Western Cape.

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Signature November 2022

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Dr Tania Steyl (Supervisor)

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Prof. Julie Philips (Co-supervisor)

DEDICATION

To my parents, Mr and Mrs Petersen, you pushed me into further education, and I will be forever grateful for it. Your belief, support and care during this journey have been unwavering. You taught me that the impossible does not exist and I can achieve anything. There were challenges along the way, but you always had the right words at the right time, allowing me to persevere.

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I am grateful to all participants who gave up their time to complete questionnaires and interviews that provided invaluable information that support the clinical decision-making of healthcare professionals, both novice and veteran. This achievement is as much yours as it is mine.

I am still in awe of my colleagues, who graciously opened their doors to assist in obtaining data for this project and their advice on the final product. A great collaborative effort to the benefit of all the patients we serve. The heartfelt thanks also reached out to my colleagues who provided stern and constructive criticism during the final phases of constructing this project.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Absenteeism due to sick leave costs the South African economy between 12 – 16 billion rands annually, with a 15% absenteeism rate on any given day and 40% having no diagnosis warranting sick leave (Occupational Care South Africa, 2014). In general, the workers of low and middle-income countries (LMICs) cite various reasons for absenteeism linked to physical and psychological well-being (Belita et al., 2013). The occupation, combined with psychological and social factors, remains one of the greatest risk factors for absenteeism from work due to pain (Bonzini et al., 2015). Manual labourers and blue-collar workers are at the highest risk for musculoskeletal disorders (MSDs) due to their work's physical demands, which has made these workers keen to understand absenteeism due to pain (Andersen et al., 2016).

In South Africa, MSDs remain a major cause of absenteeism from work (de Beer & Maja, 2016). Work-related musculoskeletal injuries and extended absenteeism have become commonplace in developing countries due to the lack of implementation of ergonomic principles compared to developed countries (Kataria et al., 2021). MSDs are not solely responsible for absenteeism but, when coupled with preexisting psychological disorders such as stress or anxiety, impede the expected return to work (RTW) timelines (Kocakulah et al., 2016). RTW is not synonymous with complete recovery from an MSD; ongoing pain is expected but often leads to recurrences of absences (Bultmann et al., 2007). MSDs and their associated pain are steadily gaining recognition as mundane symptoms like back and neck aches are leading causes of persistent and extended time off from work (Ajayi & Thwala, 2014). South Africa is no exception to this as a study by Parker and Jelsma (2010) found that at least 362 /100 000 community members attending a clinic reported MSDs, which is more than double the expected 144 / 100 000 for sub-Saharan Africa.

Pain is a common experience that can affect everyone and greatly impairs function in meaningful life roles such as family, leisure, work and personal goals (Poulain et al., 2010). Major facilitators of pain after injuries have healed can include lifestyle factors, psychosocial factors, and attitudes and beliefs concerning pain (Cilliers & Maart, 2013). There is awareness of the impact of MSDs in developing countries (Wang et al., 2018). Yet no efforts compared to developed countries have been designed to combat the damaging effects on the population and economies such as South America, Africa and nations in the Middle East (de Andrade, 2019). The absence of action in addressing MSDs is attributed to the lack of recognition and understanding of an individual's pain beliefs and emotional and mental well-being on the pain experience (Roelen et al., 2018). In a systematic review by Darlow et al. (2011) showed a strong relationship between the pain attitudes and beliefs of the healthcare professional and the patient they have seen. This discovery has made maladaptive pain beliefs an iatrogenic construct of the healthcare system (Lin et al., 2013). Pain attributable to MSDs can affect the rate of absenteeism and labour force participation and cost the economy hundreds of millions to billions each year (Langley et al., 2010). Sears et al. (2012) assessed a prediction model to determine disability and medical cost outcomes on the United States of America's Worker's Compensation System. They found that injury severity was inaccurately recorded in emergency departments of Washington State, resulting in either overtreating patients or wasteful expenditure (Sears et al., 2013). In South Africa, there is a high presence of non-evidence-based approaches for treating symptoms such as lower back pain resulting in inadequate resource expenditure and placing further strain on the healthcare system (Major-Helsloot et al., 2014). The true impact of pain attributable to MSDs on the world's economies is being grossly underestimated, mainly due to a lack of standardised assessment measures epidemiological data with pain not being represented on the International Classification of Diseases (ICD) system (Blyth et al., 2019).

LMICs are being overwhelmed, and its workforce encumbered since the incidence rate of MSDs rose by 60% from 1990-2010 (Hoy et al., 2014). A global burden of diseases study by Moradi-Lakeh et al. (2017) in the Eastern Mediterranean region showed that the population of years lived with disability from MSDs had increased to 105.2% over 20 years compared to the rest of the world with 58.0%. Coggon et al. (2020) examined sickness absence in occupational groups in 18 countries and found that the number of painful sites correlated positively with the duration of absenteeism and risk of long-term sickness absence (LTSA). The severity and number of painful experiences further weaken the workforce. A work audit study conducted by Stewart et al. (2003), on the United States of America discovered the productive time lost due to pain-related symptoms was estimated to cost 61.2 billion dollars. Individuals who experience pain-specific conditions have reduced participation in the labour force resulting in a higher incidence of absenteeism (Besen et al., 2015). The loss in output from absenteeism due to pain places a burden on society and income lost by employers places strain on the economy (Alavinia et al., 2009). Workers are of particular interest, especially adults aged 45 years and over, as the prevalence and pain intensity increase with age (Riley III. et al., 2014).

South Africa is included in the turmoil of absenteeism due to MSDs and the variety of our economy with sectors in agriculture, fishing, forestry, mining, automotive, textiles and metalworks, to name a few makes it significantly vulnerable. South Africa is a disturbingly ill country with high rates of obesity and chronic dieases which is magnified in the aged (50-64 years) population that is wrought with non-communicable diseases (NCDs) such as rheumatoid arthritis, osteoarthritis and migraines which are also considered MSDs (Rasmussen et al., 2017). In the 2019 Global Burden of Diseases Study conducted by Abbafati et al. (2020) which includen Northern and Southern African regions, South America, Middle and Central Asia discovered that the incidence rate of these types of NCDs was between 25% - 29%, which is also higher than in other southern African countries and had risen in the last 20 years. Pain and MSDs for South Africans have become more significant as approximately 19.5% of the population has been diagnosed with the human immunodeficiency virus (HIV) (Stats SA, 2021). A systematic review by Parker et al. (2014) showed that pain experiences exist within 55% - 67% population living HIV/AIDS at all stages of the disease. This disease is an amplifier of pain which can act as a catalyst for absenteeism from work (Parker et al., 2014).

In South Africa and abroad, persistent pain remains a biopsychosocial phenomenon, with nearly a third of patients presenting with persistent pain also having clinical depression, which is three times higher than the national lifetime average in South Africa (van Vreede et al., 2022). Yet, at South Africa's primary care level, screening for psychosocial factors is not standardised and HCPs need to incorparate yellow flag assessment into their patient care. (Major-Helsloot et al*.,* 2014). Africa is a continent in pain and not enough research is being done on pain or pain-related topics to make her voice heard compared to Europe or North America (Onyeka & Chukwuneke, 2014). Healthcare professionals treating patients in pain have a mandatory responsibility to understand their patient's experience of pain and how it impacts them. In the minimal evidence in Africa, we have the majority of patients with pain expressing fear-avoidance and catastrophising beliefs towards pain with their HCPs favouring passive treatments and enforcing biomedical beliefs (Ahenkorah et al., 2019).

"I am diminished. Tears come to my eyes unbidden. A new shadow 'disabled shame-self has replaced me: Weak, vulnerable, handicapped, needy. Where are my resources? I can't cope. Exhaustion overwhelms."

An account of Linda Finlay (Finlay, 2012)

Pain can debilitate the individual and obstruct them from participating in meaningful life roles, regardless of the aetiology (Knittle et al*.,* 2011). Whether the cause is arthritis, MSDs, irritable bowel syndrome (IBS) or cancer, it still has the same distressing impact on the sufferer (Duffield et al., 2017). Pain is no longer seen simply as a symptom of comorbid conditions such as depression, chronic fatigue syndrome or obesity, but rather as a cause of these conditions due to its nature of progressively deteriorating one's ability to function (Jamison & Edwards, 2012). Rauf et al. (2014) examined the impact of pain on quality of life in patients attending primary health care clinics and discovered that more than 50% of participants experienced an adverse effect in all six parameters which included quality of life, sleep, walking ability, housework, mood, interpersonal relationships and enjoyment of life. Pain management methods such as medication and surgical intervention appear to have a minimal positive impact on quality of life due to a lack in understanding of pain or the presence of abnormal pain beliefs (Schirbel et al., 2010). The overall effect on physical function and work performance is relentless as it places people's entire lives on hold because they have an arduous time understanding their symptoms and finding ways to resolve them (Hadi et al., 2019).

1.2 SIGNIFICANCE OF THE STUDY

Exploring the correlation between pain attitudes and beliefs and absenteeism from work could provide us with beneficial information towards understanding absenteeism rates amongst patients with MSDs. It could also aid in understanding its impact on the patients' daily life and the relationship to their beliefs and understanding of pain. This could identify a critical target for healthcare to address earlier in patients with MSDs to reduce the risk of absenteeism from work and lessen the economic burden. Furthermore, this study could motivate for the necessary paradigm shift to earlier screening and management of the psychosocial components of the pain experience.

1.3 PROBLEM STATEMENT

The prevalence of chronic pain varies between 11.5% and 55.2% among western nations (Takura et al., 2015). Similar rates have been identified in the Far East, with the most at-risk age group being 20 – 69 years (Takura et al., 2015). The cause of the pain can be psychological and compounded by other comorbidities and yet still displays adverse effects on health and physical functioning (Rios & Zautra, 2011). Workers, especially those in manual labour such as manufacturing and metallurgy, are particularly at risk, with 35.8% prevalence of lower back pain and a 63.9% lifetime prevalence in South Africa (Himalowa & Frantz, 2012). High absenteeism rates are a global phenomenon with long-term and recurring physical illnesses (Kocakulah at al., 2016). The biopsychosocial approach argues that biological and psychosocial factors contribute to the pain and disability experience (Besen et al., 2015). Psychosocial factors are profoundly associated with recovery from injury and absenteeism from work or participating in meaningful life roles (Diener et al., 2015). These factors are attributed to work safety or demand, overall stress and conflict in time management between home and work life (Janssens et al., 2014). The most assertive attitudes linked to these factors are the worker's need for solicitude and the loss of control over their symptoms and daily life in general (Turk et al., 2016). This study seeks to understand the relationship between pain attitudes and beliefs about absenteeism and health-related quality of life in workers experiencing musculoskeletal disorders. This will support necessary changes healthcare and occupational health policy. Understanding the relationship between beliefs and absenteeism can be used to develop guidelines that addresses the approach to treating workers with MSDs. One aspect is outlining psychosocial factors that need to be assessed in addition to the physical symptoms.

1.4 RESEARCH QUESTIONS

- What is the relationship between pain attitudes and beliefs, absenteeism and health-related quality of life of workers with musculoskeletal disorders?
- What are the experiences of workers who are trying to manage pain attributable to musculoskeletal disorders?

1.5 AIM OF THE STUDY

To investigate the relationship between pain attitudes and beliefs, absenteeism and health-related quality of life of workers with musculoskeletal disorders and their experiences in managing their pain.

1.6 SPECIFIC OBJECTIVES OF THE STUDY

To determine:

1.6.1 the ***pain attitudes and beliefs*** of workers with musculoskeletal disorders

1.6.2 the ***days absent from work*** of workers with musculoskeletal disorders

1.6.3 the ***health-related quality of life (HRQoL)*** of workers experiencing pain attributable to musculoskeletal disorders

1.6.4 the ***relationship between pain attitudes and beliefs and absenteeism from work*** of workers with pain attributable to musculoskeletal disorders

1.6.5 the ***relationship between pain attitudes and beliefs and workers' quality of life*** with pain attributable to musculoskeletal disorders.

1.6.6 To explore workers' experiences in managing pain attributable to musculoskeletal disorders.

1.7 DEFINITION OF KEY TERMS

The most significant terms used in this study are defined below:

Pain attitudes and beliefs: understanding and predisposition towards pain, such as harm, disability or solicitude, culminating in fundamental truths governing behaviour towards pain such as fear-avoidance (Caneiro et al., 2021).

Musculoskeletal disorders: a spectrum of rheumatic and osteoarthritis, common conditions with an unclear aetiology such as back or neck pain and shoulder pain or specific to occupational or sport-related activities such as lifting injuries, or sprains and strains (Woolf et al., 2012)

Health-related quality of life: how well a person functions in their life and their perceived physical, mental and social well-being ultimately determining their perceived state of health (Karimi & Brazier, 2016)

Absenteeism: an employee is not present at work and is an indicator of the well-being of employees and a predictor of health consequences (Taibi et al., 2021).

1.8 ABBREVIATIONS

BPS	Biopsychosocial
HCP	Healthcare professional
HIV	Human immunodefiency virus
HRQoL	Health-related Quality of Life
ICD	International Classification of Diseases

IOD	Injury on duty
LMICs	Low- and middle-income countries
LTSA	Long-term sickness absence
MSD	Musculoskeletal disorders
NCD	Non-communicable diseases
NHI	National Health Interview
RTW	Return to work
SOPA-R	Survey of Pain Attitudes-Revised
WHO	World Health Organisation

1.9 SUMMARY OF CHAPTERS

Chapter One provides the rationale for the study and highlights the threat of pain attributable to MSDs to workers and the economy. The rationale, aims, and specific objectives of this study are outlined. This chapter ends with the definition of terms and abbreviations used in this study

Chapter Two presents a review of the relevant literature for this study. It begins with the history and evolution of the understanding of pain followed by the attribution to MSDs. The effect of MSDs on health-related quality of life is followed by the relationship between MSDs and absenteeism from work. The definition and relevance of pain attitudes and beliefs within MSDs are discussed. Lastly, the BPS model is described, the rationale for its use and the conceptual framework for this study is discussed.

Chapter Three describes the methodology used to achieve the objectives of the study. It explains the research approach and the setting where data was collected. Data collection methods for the quantitative and qualitative phases are described, which include population and sampling, inclusion and exclusion criteria, data collection procedure and analysis. Lastly, the ethical considerations for this study are discussed.

Chapter Four provides the collected quantitative data summarised in tables and graphs. Inferential statistics were applied to determine relationships within the data in line with aims and objectives of this study.

Chapter Five presents the qualitative data analysis in five themes with direct quotations from the participants.

Chapter Six provides a deliberation based on the results of this study concerning the research questions, aim and objectives. It begins with describing the dominant approach currently used in musculoskeletal healthcare. This is followed by an amalgamation of quantitative and qualitative data findings concerning the relationship between pain attitudes and beliefs and absenteeism from work, its impact on HRQoL and the overall experience of workers with MSDs. Lastly, the need for improving support for workers with MSDs and adopting a BPS approach to managing MSDs is discussed.

Chapter Seven summarises the study, followed by the limitations and future recommendations. I am concluding with the significance of this study for future research.

CHATER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter provides an overview of how the pain associated with MSDs has besieged global healthcare systems and waylaid their workforce and economies because of misconstrued ideas due to a lack of understanding. To begin with, a brief history of pain followed by its relationship with MSDs are provided. It is followed by the impact of pain on workers and how it transpires. Focus is also brought to the economic impact of pain and absenteeism because of MSDs and why swift action is necessary to reduce wasteful expenditure within healthcare systems. The dimensions of pain attitudes and beliefs will be discussed, how they influence an individual's decision-making and how these manifests into disability. Lastly the theoretical framework used in this study is discussed, and the chapter concludes with a short summary of the literature reviewed.

2.2 PAIN: HISTORY AND EVOLUTION

Pain is an unpleasant sensory and emotional experience that is associated with, or resembling that associated with actual or potential damage (Raja et al., 2020). This is the definition that modern neuroscience has created and displays the complexity of pain. The idea that pain is purely a reflection of the state of tissues was extensively dismantled over three decades ago, but a four hundred year old methodology persists (Wallwork et al., 2015). This persistence has resulted in a fallacious impression that chronic pain is a disease creating medicalised healthcare systems and the development of a false sanctuary that pain is biomedical a certainty (Cohen et al., 2013). Advances in research have been vehement in refuting this idea, but there is still a relentless approach of treating the pain rather than the patient (Tsagareli, 2017). This inadequate approach resulted in medical communities believing that pain is a purely physical experience of the body, absent of the individual's influence and that persistent pain is simply psychological malingering (Scharwz et al., 2017).

Healthcare professionals (HCPs) fell into this trap four hundred years ago, and the overwhelming majority are still there. The first concept of pain was described over 3000 years ago but it was not until Renê Descartes (1596 – 1650), who created the Dualism Model of the human body, which the Biomedical Model is based on found the general approach to pain management (Chen, 2011). Descartes separated the body from the soul and perceived man as a machine. He theorised pain signals were transmitted from the body to the brain, and thus the pain is always directly proportional to the extent of the injury (Khan et al., 2015). There was no room for a psychosocial contribution to Descarte's pain theory such as that of the Biopsychosocial Model of Engel in 1977, built upon the Pain Neuromatrix developed by Melzack and Wall in 1962-1965 (Burmistr, 2018). The understanding of Descartes gave the Christian Church more control over the well-being of the mind (soul) and healthcare professionals' only purpose was to care for the body (Sagan et al., 1997). This belief was and still is highly erroneous as it does not explain symptoms without an identifiable biological cause (Brooke, 2018). It attempted to displace the mind and body in two different worlds, now seen as a delusion to modern psychology and neuroscience as both operate in tandem within the same existence (Brooke, 2018). Four hundred years ago, things seemed to get out of control as human beings were viewed as automata. The understanding progressed to just over fifty years ago when the founders of modern pain science arrived (Perl, 2011).

Ronald Melzack and Patrick Wall's revolution with the pain-gate and pain neuromatrix opened an infinite number of bridges into pain research (Perl, 2011). Their work solidified the fact that pain is a Biopsychosocial (BPS) phenomenon by describing its three dimensions, namely, sensory-discriminative, affective-motivation dimension and cognitive-evaluative, which gave early momentum to the now scientific fact that pain is a product of the brain (Lumley et al., 2011). This model provided a physiological basis for previously inexplicable symptoms (e.g. phantom limb pain), created the need for an interdisciplinary team process and highlighted mental health disorders as contributors to the pain experience (Katz & Rosenbloom, 2015). In 1983 CJ Woolf published a study on Central Sensitisation that detailed the augmentation and amplification of sensory signalling within the spinal cord, which accurately explained an increase in pain without an increase in nociception or additional injury (Woolf, 2011). Through the years of understanding central sensitisation, it became more possible to manage and treat a plethora of painful conditions, including MSDs and the enigma of chronic pain was slowly eroded (Woolf, 2011). The evolved understanding into the early 1990s should have silenced the biomedical model as there was sufficient evidence that pain involves more than the body's tissues (Moayedi & Davis, 2013). It is clear that there was extreme resilience to change and to realise that all things including pain are amenable to change with human beings. The failure of the past can be attributed to the lack of accessibility of information as we are now in the era of Explain Pain and Pain Neuroscience Education.

Moseley and Butler have been trying to decipher and demystify pain for the general public for over 15 years by education on clinical neuroscience in its most basic form, proving all pain can change and strongly advocating for the BPS Model of Health (Moseley & Butler, 2015). Their efforts led to the rise of pain education globally to change the individual’s perception from a damage meter to a ‘protectometer’ (Malfliet et al., 2018). The relevance of education as a treatment is fundamental as it acts on the brain and it is well established that extensive networks involving the prefrontal cortex, amygdala, mid-brain, hippocampus, and parietal cortex create the pain experience (Ong et al., 2019). Ploner et al. (2017) discovered that the normal brain rhythms become severely disturbed leaving a valid reason for the irritability, sleep disturbance and memory loss that sufferers experience and verifying that ‘pain kills your brain’. The brain needs to be viewed as a mass of ‘neurosignatures’ as described by Melzack or ‘neurotags’ as described by Butler and Moseley. The researchers described that every output of the brain, whether it be emotion, movement or pain, has a specific network of neurons associated with it (Butler & Moseley, 2017). These masses of neurotags based on everything we think, feel, and believe are in constant competition but are amenable to change, which is a testament to the brain's neuroplasticity (Moseley et al., 2015). Simultaneously our neuroplasticity can betray us as emotional dysregulation or a pre-existing maladaptive pain belief system already impairs our ‘protectometer’ before incurring an injury or painful condition (Koechlin et al., 2017).

The fantastic news is that pain education and cognitive therapies are becoming the first-line treatment for chronic pain and being designed to address maladapative beliefs, emotions and unhelpful ideas to encourage and empower the individual to full function (Leake et al., 2021). The scientific understanding of pain has been a rollercoaster over centuries but our present understanding has been the most effective at treating it. HCPs now have the responsibility of learning and ensuring the message reaches all their patients.

2.2 MUSCULOSKELETAL DISORDERS AND PAIN

MSDs are the largest contributors to the silent epidemic of pain and consist of conditions like back pain, neck pain, arthritis, headaches, shoulder pain and various other joints with a myriad of diagnostic labels (Gcelu & Kalla, 2015). It has become a hindrance to industries such as agriculture, mining, forestry, and transportation and has a far greater impact in the developing world where these industries are vital to the economy (Varghese & Panicker, 2022). Incidence rate of MSDs continues to rise unimpeded and is largely due to poor understanding of it and a lack of implementation of evidence-based clinical practice guidelines to treat it (Lin et al., 2017). In emergency departments of the United States of America, there is poor understanding of myofascial pain syndromes, which often leads to unnecessary assessments of patients who are also then overtreated for this simple pain condition (Roldan & Hu, 2015). In South African pre-hospital settings, pain management is not considered a priority of care or inappropriate pain management was provided due to a lack of knowledge across multiple healthcare disciplines (Lourens et al., 2020).

Ng et al. (2019) assessed the prevalence of MSDs amongst teachers in Malaysia, found an 80.1% incidence rate over six months of assessment. The researchers found that depression is a mediator for MSDs. This demonstrates that even less physically intensive professions are not excluded from experiencing MSDs but have other factors associated with its cause. LMICs are at higher risk for MSDs due to physically strenuous living conditions where tasks such as having to collect water still exist and creates a high incidence of disability due to MSDs (Geere et al., 2018). In South Africa pain attributable to work-related MSDs are being found across multiple occupations such as mining (Rabie et al., 2021), transport industry (Rugbeer et al., 2016) and performing arts with multiple site pain often being reported (Ajidahun & Philips, 2013).

To prevent MSDs in workers more research is needed in the implementation of prevention strategies and existing policies need to be strengthened and implemented effectively (Van Eerd et al., 2016). A systematic review by Sundstrup et al. (2020) identified that a multifaceted approach is needed to prevent and manage MSDs in workers, including worker involvement in ergonomics, stress management, and improving worker fitness levels while incorporating the BPS Model into occupational healthcare. Ultimately, improving care and treatment outcomes in workers with MSDs requires the collaboration of multiple sectors within state and private corporations to implement scientific evidence-based guidelines that enable faster RTW and prevent further burden to the economy (Lin et al., 2018).

"The history of pain problems is as long as that of human beings, however, the understanding of pain mechanisms is still far from sufficient" (Chen, 2011)

2.3 PAIN AND QUALITY OF LIFE

Pain is the most common symptom-based experience reported by the general population and in primary care (Kroenke et al., 2013). It is the most common complaint brought to primary care physicians and first-line practitioners, and it is only recently gaining traction as clinical competency component at undergraduate level (Gordon et al., 2018). Pain is the silent epidemic fuelled by unproven treatments, poor clinical practice guidelines and ill-equipped HCPs (Foster et al., 2018). Preventing the deterioration of quality of life and the restoration of full function may only be successfully achieved through interdisciplinary teamwork (Gatchel et al., 2014). A more significant investment of time is needed from clinicians treating patients with chronic pain due to the unrivaled effect of the clinician-patient relationship on improving quality of life (Finset, 2012). The world needs healthcare professionals with passionate interest in people not just conditions if they are to make a difference in the lives of their patients. Achieving high quality person-centred care requires obtaining the story, building a relationship, avoiding generic reassurance and providing cognitive reassurance (Belton et al., 2022). These components are imperative to regarding the patient-as-person, emphasising biopsychosocial perspective, preservation of autonomy and working collaboratively to achieve outcomes (Hutting et al., 2022).

Chronic pain is defined as pain lasting at least three months and its prevalence varies between 11.5% - 55.2% amongst western nations (Takura et al., 2014). Pain can lead to a variety of psychological and social issues, emotional distress and work disability, ultimately creating a dysfunctional individual (Jamison & Edwards, 2012). The individual loses sight of their own goals, develops a solicitous self-interest, and becomes dependent on everyone within their environment (Knittle et al., 2011). Chronic pain especially becomes challenging as it affects the quality of life and hinders routine physical, social and physiological functions (Michaelis et al., 2015). Other symptoms chronic pain may cause include sleeplessness, depression, emotional distress and anxiety (Michaelis et al., 2015). If the initial injury was traumatic for the patient, associated pain becomes more emotionally distressing and places them on a downward spiral (Outcalt et al., 2015). Workers are vulnerable to pain and its associated symptoms and far more in the cases of multisite concurrent pain which invades their private life and further exacerbates overall symptoms (Vleeshouwers et al., 2019). The greater proportion of a society that is impacted by pain poses a greater risk to the whole society as the social risks encompass all within it (Rethorn et al., 2022). Being without pain does not imply one does not experience some of its effects. Urgency is needed to preserve the quality of life of an individual with pain and prevent disability.

MSDs are often overlooked by primary care practitioners but are very prevalent as a source of pain, with their risk increasing with age (Duffield et al., 2017). LMICs are at the top of the prevalence list due to the physically demanding labour performed within agriculture, mining, forestry and automobile production industries (Kumaraveloo & Kolstrup, 2018). South Africa is a major global contributor in all these sectors, leaving it with no luxury to continue ignoring the effect of MSDs on its workers. Loisel et al. (2005) had admonished of a global risk that poor implementation of evidence and non-clinical interventions would significantly increase work-related MSDs and absenteeism. The present-day difficulties with absenteeism due to MSDs have unfolded precisely as expected. A global prevalence study on MSDs which included 195 countries used data collected from 1990 – 2017 and discovered the number of prevalent cases stood at 1.3 billion in 2017 (Safiri et al., 2021). The National Health Interview (NHI) Survey conducted by the United States Census Bureau in 2012 reported that 54% of adults suffered from a MSD (Blackwell et al., 2014). The disability caused by MSDs were evident in the work force productivity, performance in activities of daily living and overall quality of life (Mali et al., 2018). Van de Ven et al. (2019) examined the impact of MSDs on the quality of life of people with HIV in Zambia and found that 62% experienced fatigue symptoms and poor quality of life within the domains of general health, vitality, social functioning and mental health. MSDs pose a similar threat to the quality of life of the workers of South Africa. Kroenke et al. (2013) examined the association between health-related quality of life and functional impairment in patients attending primary settings in the United States of America. The researchers discovered that nearly half (45%) of the patients had one or more anxiety disorders. All patients presented with persistent pain from a MSD and reported worse health-related quality of life across multiple domains, emphasising the link between pain, psychological status and function (Kroenke et al., 2013).

De Vries et al. (2012) examined self reported work ability and performance of workers with chronic musculoskeletal pain and the results showed logistic regression between work ability, general health perception, pain and self efficacy (p =0.002). Overall work ability rated at poor to moderate. Workers who showed high work ability or performance despite their symptoms also had high self-efficacy, which may be due to their pain beliefs (de Vries et al., 2012). It cannot be disregarded that pain is also a perception and that the worker, their role and culture influences the understanding of pain and is not an equivalent sensation to everybody (Coggon et al., 2013). There is a higher need for the inclusivity of psychological treatments for pain that addresses maladaptive pain attitudes and beliefs such as harm, disability, solicitude, catastrophising and fear-avoidance (Kerns et al., 2011). Pain from a MSD and its associated quality of life deficit places lives on hold, leaving workers with fear for their future as an individual and their financial security (Bunzli et al., 2013).

"Fear of pain and what people do about pain may be more disabling than pain itself"
(Waddell, 1996)

2.4 PAIN AND ABSENTEEISM

Pain is a defining symptom of many diseases, including MSDs and can be used as an index for the severity and activity of an underlying condition (Henschke et al., 2015). MSDs are a major cause of morbidity, disability and long-term absenteeism from work with significant economic impact (Bonzini et al., 2015). It is a persistent and accelerating global threat with rapidly incalculable losses to work days with the side effect of early retirement or workers being boarded due to persistent pain (Briggs et al., 2016). MSDs account for 6.7% of the total global disability-adjusted life years and ranked as the fourth most significant burden on the health of the world's population (Woolf, 2015). Cuckler et al. (2013) already predicted that the USA federal, state and local government would account for 49% of healthcare expenditure to the value of 2.4 trillion dollars. Krohm (2009) had already predicted that well before the end of the century, the USA would be spending over 10% of their gross domestic product (GDP) on health, half of which will account for worker-related injuries. Acute work-related trauma is a leading cause of disability among US workers, with the direct cost of care reaching up to 192 billion dollars annually (Sears et al., 2013).

In Southern Africa, great strides were made to implement social health insurances, which improved healthcare coverage for health systems that were not yet physically and economically prepared for it (Tetteh, 2012). The first reason is the high use of prescription opioids in Africa due to the population of patients with HIV/AIDS who are more vulnerable to pain (Manjiani, et al., 2014). The second reason is the widespread use of ineffective treatment strategies and poor implementation of standardised clinical practice guidelines for MSDs, popularised by a biomedical healthcare system (Major-Helsloot et al., 2014). Those two actions are a recipe for catastrophe, which is why it must be re-iterated that simply because you are not experiencing pain does not imply you will not be affected.

Bevan (2015) discussed four factors that influence workforce health within the European Union, namely the ageing workforce, which increases the risk of absenteeism due to poor health; the pension crisis, which forces the population to work past the average retirement age; the growing burden of chronic disease which is magnified by an ageing workforce and the productive capacity declines as a result; and lastly the inequality of health care because only a healthy workforce are able to develop and contribute their skills and sustain high work productivity (Bevan, 2015).

In South Africa, the impact of absenteeism on the economy and individual companies has mainly gone unnoticed and costs the economy a fortune (OCSA, 2014). The more vulnerable populations who may not have equitable access to healthcare services and who are also at higher risk of experiencing MSDs show higher absenteeism rates (Garnett et al. 2020). A catalyst to this effect arises from the knowledge, attitudes and practices of HCPs in primary care and pre-hospital settings that are lacking and disparate from current neuroscientific evidence on pain (Lourens et al., 2020). This is widespread throughout middle and southern Africa, leading to continuous loss of workdays and functional impairments within workers across multiple sectors of the economy (Temesgen et al., 2019). Working conditions and biomechanical risk factors are playing a significant role in workers lifting heavy loads in LMICs (Kataria et al., 2021). The converse occurred in high-income countries where biomechanical factors were not a positive correlation to absenteeism from work due to MSDs as satisfactory working conditions were reported (Neupane et al., 2014). This presents a clear argument for the influence psychosocial factors have in absenteeism rates due to MSDs.

The economic impact of absenteeism due to MSDs is a global concern as millions of Americans suffer from chronic pain. The researchers discovered that 100 million working-age individuals were affected by persistent pain, which cost the economy approximately 600 billion dollars in workdays missed (Gaskin & Richard, 2012). In studies by Langley et al. (2010), Sears et al. (2013), and Neogi (2013), the researchers estimated the direct costs of care for common pain disorders such as migraines, MSDs arthritis and lower back pain to 100-200 billion US dollars annually. The few studies in South Africa that MSDs and work-related MSDs are prevalent in more than 50% of workers within high and low-skilled jobs (Booyens et al., 2009; Phairah et al., 2016). The collective cost to the economy of MSDs can be derived from liability claims from insurers, legal costs, payment of sick or incapacity leave, market and insurance premium adjustments which demonstrate the economic impact extends beyond the worker (Mona et al., 2019; Theodore et al., 2015). If interventions for workers with MSDs are initiated earlier, savings on medical expenses reached 64% and disability savings up to 80% but this was dependent on the management of psychosocial factors within workers (Mona et al., 2019; Theodore et al., 2015). Worker's compensation systems suffer the bulk of the financial strain but simultaneously contribute to the problem with poorer health outcomes due to inefficient administration, perceived injustice by workers and amplifying healthcare utilisation (Murgatroyd et al., 2015). Other factors are iatrogenic due to low research capacity, poor healthcare policies, overuse of imaging or ineffective surgeries that result in wasteful expenditure (Pierobon et al., 2021). Haeffner et al. (2018) retrospectively examined absenteeism amongst Brazilian workers and discovered that nearly five million work days were missed due to MSDs. Astonishingly, the rate of absenteeism was higher in individuals with a lower level of education and within that group the highest was amongst those aged 50 and above (Haeffner et al., 2018). The lower level education leads to a lack of diversity in work opportunities exposing workers to repetitive tasks that result in injuries over time (Haeffner et al., 2018) .In a study by Rios and Zautra (2011) on disparities between economic hardships and pain, significant correlations were found between low socioeconomic status and the symptoms being expressed by participants. This was magnified in individuals who were not working and experiencing chronic pain (Rios & Zautra, 2011). The magnitude of economic costs of pain should prompt more research into reducing its impact through education and care (Gaskin & Richard, 2012).

Chronic pain is detrimental to one's quality of life and leads to an ever-growing inumerable cost (Henschke et al., 2015). There are very few guidelines on sickness absence management that addresses musculoskeletal and common mental disorders, both of which many cases, result in chronic absenteeism from work (Etuknwa et al., 2019). Earlier interventions may be necessary to reduce the risk of a chronic pain experience and economic burden to solve the problem of absenteeism due to MSDs (Bevan, 2015).

2.5 PAIN ATTITUDES AND BELIEFS

'*Not everything that can be counted counts and not everything that counts can be counted*'
(Toye, 2015) Attributed to Albert Einstein.

When pain was identified as a biopsychosocial phenomenon it led to the important discovery of psychosocial factors as a mediator of suffering (Moseley & Butler, 2015). Psychosocial factors have already been identified as more robust predictors of outcomes when treating pain and predict whether biomechanical/biomedical factors will resolve (Main et al., 2012). Pain in the absence of a biological cause is often found to be sustained by a misaligned thought processes resulting from dispositional fear, anxiety, depression, catastrophising and hypervigilance (Carleton & Asmundson, 2012). Rusu and Pincus (2012) described that pain is facilitated through the individual's cognitive processes and that biases relating to attention, interpretation and memory alter pain perception. This inspiration compellingly indicates that all actions, thoughts, emotions, ideas, and memories affect the pain experience. Healthcare professionals often misunderstand workers because their concerns about their pain are embedded in their attitudes and beliefs, which are not identified or discussed (Coole et al., 2010). An example is presented by Singla et al. (2014) who examined the competency of physiotherapists in assessing psychosocial factors in patients and identified four (4) themes, namely: Unclear about what psychosocial means, Limited training and education, Assessment based on 'gut' feeling and Need for formal training and additional tools. Managing pain attitudes and beliefs works both ways between the patient and the healthcare professional and a lack of understanding may only exacerbate the problem.

Knowledge of psychosocial factors and how they influence the pain experience is necessary in assisting people in making sense of their pain and preventing unhelpful beliefs from manifesting (Robinson et al., 2016). Individuals experience pain in many ways, often subjectively based on their perceptions and descriptions of their condition (Bevers et al., 2016). The way patients perceive and convey this information affects any clinician's interpretation, making assessing and treating pain an enormous task (Bevers et al., 2016). The infiltration of medicine into the treatment of MSDs has become the premise for maladaptive beliefs as it is based upon ideas that pain equals damage, only medication can treat pain, rest is essential, and these problems are a result of your age (Lewis et al., 2020). It is established that older adults (50 years and above) are more sensitive to potentially noxious stimuli but this is as a result of changes within the peripheral and central nervous system resulting in altered pain perception; yet healthcare professionals maintain the idea that tissue changes are the solitary cause of pain (Domenichiello & Ramsden, 2019). Evidence continues to refute this idea as an increase in symptoms can be mediated by fear-avoidance beliefs, ability to control pain, ability to reduce pain and perform tasks and the perceived level of disability (Broadbent et al., 2018).

Fear-avoidance mainly encompasses beliefs of harm, and disability which ultimately results in the individual avoiding specific movements and activities due to the fear of the pain (Bunzli et al., 2013). If this behaviour persists, the tasks or movements become predictive of pain and the brain has learned pain (Bunzli et al., 2015). This experience is amplified by maladaptive cognitions such as catastrophic thinking, which erodes the individual's self-efficacy and instils a belief that their pain cannot be managed, thereby reducing their ability to participate in meaningful life roles (Taylor et al., 2016). Catastrophising and catastrophic thinking are cognitive processes that can affect perceptions, expectations, experiences, and memories by interpreting minor problems as life-threatening (Caneiro et al., 2019). Orhan et al. (2018)

examined how pain beliefs, cognitions and behaviours are influenced by the person, and it was based upon what they learned from health care professionals, other individuals and society. Healthcare professionals instill a belief that pain associated with conditions such as osteoarthiritis will be constant and impossible to change. Societies present with their health beliefs that vary between and within countries which can be a belief of hope that symptoms will improve or this condition is permanent translating into disability. The specific influence that interpersonal dimensions have on pain is not yet well understood which supports the need for the Biopsychosocial Model of Health as we may be unintentionally influencing each other's pain (Turk et al., 2016). If maladaptive beliefs and cognitive dimensions were addressed at all healthcare system levels, the absenteeism rate would decrease, return to work outcomes would improve and a sharp decline in the prevention of work disability (Besen et al., 2015).

The person experiencing pain does not bare sole responsibility for these phenomena because at the other end of the spectrum, the healthcare systems and healthcare professionals stigmatise patients with pain, are bewildered by it and often act without empathy or compassion (Holloway et al., 2007). Quantitative methods frequently missed significant findings in understanding the clinician-patient experiences with pain but concurrently with the birth of Explain Pain, qualitative studies gained popularity by finally illuminating this enigma (Gustafsson et al., 2004). Toye et al. (2021) performed a meta-ethnography of 195 qualitative studies on the 'healing journey' of patients that overcame their chronic pain and discovered six themes that enabled this: 'my pain has been validated; 'I have been validated; 'I am reconnected with myself'; I am reconnected with the world; 'I am empowered' and 'I have a future'. This displays the potency of recognising the individual and not the pain, centring on the patient and not the condition. Healthcare professionals are still being flummoxed by pain as they grapple with acknowledging that disabling pain can exist without pathology, being a hard-line professional versus empowering patients to be autonomous even when it conflicts with their own beliefs (Toye et al., 2017). This was also discovered amongst newly graduate physiotherapists in South Africa who were unprepared and only equipped with biomedical tools to treat the complexity of patients with pain (Madden et al., 2013). Chabane et al. (2018) explored the pain attitudes of physiotherapists toward patients with chronic pain and discovered that their treatment success was enabled by their ability to manage psychosocial aspects of the patient's pain. This was confirmed by Vanhaudenhuyse et al. (2018) where the researchers assessed effectiveness of physiotherapy and psychoeducation on pain and discovered significant changes in control, disability, harm and emotion beliefs. The mounting evidence supporting active approaches has caused stern calls for healthcare preofessionals to change how we address MSDs that will reduce healthcare costs and prevent disability, all in the best interest of the public (Lewis & O'Sullivan, 2018).

The relevance of pain attitudes results from modern pain science that justifies how our ideas, thoughts, actions and beliefs affect our pain experience. It becomes astronomically more complicated to manage pain the longer it manifests within the individual.

Once pain has lasted longer than is necessary, we see multiple pain mechanisms activated leading to sensitisation of the central nervous system pain pathways or altered central pain modulation (Clark et al., 2017). The application of cognitive therapies are critical to managing pain beliefs as it directly affects the central nervous system and pain processing (Nijs et al., 2019). Pain is produced by the brain and is not solely based on nociceptive input, hence psychosocial factors must be considered (Crombez et al., 2012; Brown et al., 2014). This occurs through activation of the pain neuromatrix which has specific patterns for fear, catastrophisation and pain perception and is the reason why the psychological state of an individual has a direct impact on pain perception (Louw & Puentedura, 2014; Navratilova & Porreca, 2014).

Marginal changes in individuals can alter their perception of pain as positive expectations, positive thinking and positive reinforcement has a profound effect in mitigating the pain experience of acute or chronic MSDs (Nijs et al., 2013). The ability to engage in work is linked to pain beliefs such as harm, disability, self-efficacy and perceived injustice which can exist in varying degrees (Robinson et al., 2016). A study by Wynne-Jones et al. (2011) discovered that the relationship between employee and manager significantly impacted absenteeism rates due to MSDs. A work environment with more social support and organisational policy around health problems had employees more willing to work (Wynne-Jones et al., 2011). If resources and knowledge were more readily available, it would motivate patients to be more proactive in managing their symptoms (Jinks et al., 2010). Human beings are not by default wanting to be in pain or disabled, and just by understanding their expectations and goals may create a stronger therapeutic alliance and improve outcomes (Carroll et al., 2015). We are each other's most significant influence, and sharing compassion and support alone can be enough to change an individual's perception of pain (Prang et al., 2018). The willingness of an individual to work while experiencing pain is not only about the work environment but in conjunction with family support, especially from their significant other (McCluskey et al., 2015). Ultimately healthcare professionals working with patients with pain need to address the whole person and be more creative with goal-setting strategies to improve RTW outcomes (Mallick-Searle et al., 2021).

'My final question for you, healthcare professionals, is: should you cure your ignorance first? (Gusmini, 2020)

2.6 CONCEPTUAL FRAMEWORK OF THIS STUDY

'The Biopsychosocial Model is proposed a blue print for research a framework for teaching and a design for action in the real world of healthcare' (Engel, 1977)

Engel (1977) first described the Biopsychosocial (BPS) model as a progression of pain originating from a physical problem to distress, then illness behaviour and finally adopting a sick role (Figure 2.1) thus including biological, psychological and social components. The BPS model assesses the integrated individual by seeing the mind and body working together as one unit while recognising the biological, psychological and social components of pain (Bevers et al., 2016). This model contrasts with the biomedical disease model which focuses on the bodily system and underlying physiological, anatomical and pathological processes. The BPS model accounts for the dynamic interactions among biological, psychological and social factors in the pain-experience process. Using the three spheres of this model, we examine the interrelatedness of the biological (physical health, disability, genetic vulnerabilities), psychological (self-esteem, temperament, intelligence quotient (IQ), coping skills, social skills), Social (peers, family circumstances, school/work, trauma) (Borrel-Carrio et al., 2004).

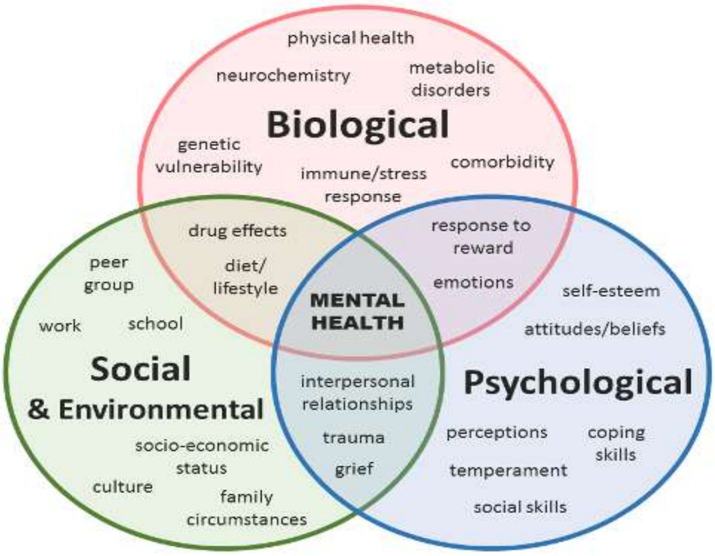

Figure 2.1 Engel's adapted Biopsychosocial Model of Health (Bevers et al., 2016)

Biological Factors

The spheres of the BPS model are never symmetrical as their contributions to each person's clinical presentation vary as the spheres are interdependent and can change over time (Jull, 2017). These factors refer to physical bodily areas, genetic factors, overall physical health structures such as nerves, muscles, bones, vital organs, bodily systems and processes, genetic factors and concepts such as biomechanics or inflammatory profile of the individual (Hainline, et al., 2017). A portion of biological factors are inherent, and the majority of changes that occur over time are subject to the individual and their lifestyle choices (Nijs et al., 2013). In response to injury, tissues usually heal within 3-4 months, and subsequent vulnerability changes result in decreasing tissue tolerance which is an adaptive response to the individual's actions (Louw et al., 2011). The outcomes of disease and injury are constantly dependent on the influence of psychological and sociological factors as the primary prognostic factors are embedded within them (Meisingset et al., 2020). The dynamic capability of these factors is seen easily in the placebo effect, where inert interventions can create change or even the fact that as the individual learns, there are alterations within the brain and spinal cord (Lehman et al., 2017).

Psychological Factors

The psychological sphere encompasses cognitive, emotional, motivational, attitudinal and behavioural processes but also includes the individual's agency, self-esteem and adaptability (Lehman et al., 2017). The body creates a ground reference for the mind and its responses cause profound changes in how tissue and whole organ systems operate (Damasio, 1995). Personal Agency is the ability of the person to act independently and autonomously, all cognitive processes and neuroscience relate to it (Fraser, 2020). Synthesising the BPS model with the person-centred interview provided psychological factors with a scientific basis and emphasised the importance of personal agency in healthcare (Smith, 2021). Person-centredness in its infancy was only found within mental health professionals and was lost to the broader scope of healthcare which developed health systems deprived of autonomy (Mead & Bower, 2000). This left the individual's psychological and ultimately physical wellbeing subjugated by the healthcare professional, creating generations of individuals with obscure medical-seeking and medical cure behaviour (Mead & Bower, 2000).

Emotion can augment the experience of ill health and subsequently alter attitudes and perceptions of the disease being experienced (Meagher et al., 2001). Pain is utterly vulnerable to this effect and easily manipulated moment to moment in a manner that could aggravate or alleviate symptoms and displayed by the individual's physical responses such as avoidance or grimacing (Rhudy et al., 2006). Negative emotions such as depression or anxiety aggravate poor health as it depreciates an individual's self-efficacy and self-perception, causing increased difficulty in treatment adherence (Bebetsos & Kouli, 2010). In the context of pain, an inability to express words for feelings is consistent pain severity, fear of expressing emotions with maladaptive beliefs and suppression resulting in physical changes within the symptomatic area of the body (Lumley et al., 2011). The healthcare professionals' words have the highest emotive power as it is capable of influencing the beliefs and attitudes of the patient and will ultimately determine if the patient’s stance on their disease or illness will be biomedical or biopsychosocial (Vranceanu et al., 2011).

Stress is a resource-intensive process that challenges internal and external threats to homeostasis, it may be the result of a physical or social event, a single microorganism or tissue trauma (Chapman et al., 2009). A stress experience of any cause results in abnormal cognitive changes, such as sleep disturbances, anxiety and irritability, and biological changes that can decrease immune system function and impair cellular repair (Sibille et al., 2017). Schwarz et al. (2017) identified emotional regulation as the primary factor in an individual's ability to mitigate the negative cognitive effects that facilitate unexplained symptoms and slower recovery from disease or illness. Abdullah et al. (2015) showed that work-related stressors, work stress and MSDs co-exist even within professions with no physical demands and indicated that proficiency in emotional regulation highlights the necessity of being mentally well to be physically well.

Social Factors

Social or interpersonal factors include the effects of actual or perceived social contacts on health (Lehman et al., 2017). It is the most neglected sphere of the model due to the difficulty of quantitatively analysing it but nonetheless bears vital data to understand how we impact each other's health (Lehman et al., 2017). Haslam et al. (2021) argues that society is built of social groups, not just individuals and that these groups are internalised by a person, which is common in patriotism and a standard health style would develop within the group. Karanamuni et al. (2020) vied for further dynamism with the BPS model of health and contended it as constantly changing pathways that occur as the social groups' beliefs change. A recent example of this is vaccinations in the era of COVID-19, which has divided nations, governments, cities and families and how it has been influenced by the media and social networks (Haslam et al., 2021). Social factors of health are complex due to the high probability of day-to-day changes, and pain is no exception, it does not operate within a vacuum and the environment and people within it influence how it is perceived and managed (Keogh, 2018). Qualitative exploration and synthesis of BPS pathways are needed to identify the missing pieces to optimising healthcare; this realm is most suited to 'social scientists' (Toye et al., 2014). Person-centred care and communication have simplified the social paradox of pain by removing them from groups and seeing them as individuals with specific wants, needs and preferences (Naughton, 2018). This style paved the way for individuals with pain to be destigmatised from the medicalising and pathogologising biomedical view, which propagated behaviours such as avoidance and catastrophising (Bolton & Gillet, 2019). A study by Mohammadi et al. (2020) proved that the actions of healthcare professionals alter patient behaviours when solicitous responses were given during treatment, the patient expressed more pain behaviours and higher levels of disability. This demonstrates the influence that interactions can have on pain outcomes and is dependent on the HCP's view when evaluating the patient. de Oliveira et al. (2020) qualitatively examined the experience of people seeking care for hip pain and discovered that predominantly structure and damage explanations given for their pain which led to avoidance behaviours, ruminating thoughts ultimately devastated their mental health. In contrast Cridland et al. (2021) assessed the experience of patients who received education for their shoulder pain and discovered that an overall health approach with an explanation at the health literacy level of the patient reduced their harm, disability and solicitous beliefs and promoted gradual, safe return to activity. Interacting with patients with the intent to improve their lives arises from adding to the existing biological explanation for pain and not removing it.

This model was chosen due to its ability to answer the study objectives and will focus on the interconnectedness of Engel’s Biopsychosocial model of health the contribution all three spheres provide to the pain experience. Within the model's interconnectedness, we find reasonable explanations for workers' choices and experiences regarding pain attributable to MSDs. Emphasis will be placed upon how the response in terms of physical actions and thought processes are sometimes of greater significance than what may be happening to bodily tissues. In answering the objectives, the model will explain how workers manage their pain experience and work participation during recovery. The results of this study could provide the health care teams with a critical target when treating workers who may be at risk for persistent absenteeism from work and prevent additional economic strain. It may aid first line health care service providers to contemplate further on the risk of booking a patient back to work with recommendations instead of placing them on sick leave.

2.7 SUMMARY OF THE CHAPTER

This chaper has provided an overview of the prevalence of MSDs within the global and South African context. It examined the harmful effect on an individual's quality of life and the associated disability. It also looked at the adverse economic impact MSDs and pain have on the labour force, and health systems and the relevance of scientific evidence-based protocols for MSDs to negate this effect. Pain attitudes and beliefs of workers and HCPs were described, and how they influence decision-making concerning treating MSDs and work participation. Finally through the conceptual framework, the complexity of the individual and a plethora of factors associated with health, pain and its influence on recovery from MSDs were discussed. Multiple studies were found that strongly outlined the poor interventions being used for MSDs in South Africa, knowledge gaps amongst healthcare professionals and clear indication that pain and MSDs are a danger to the workforce. South African research groups on pain and MSDs agree that more research is needed to understand the full extent of the threat posed by MSDs.

This literature review provided context and justification for conducting this study. The literature reviewed shows that pain and absenteeism due to MSDs has been aggravating over decades but remains silent compared to communicable diseases. There is a lack of knowledge on MSDs and consensus on how it should be managed within the working population and minimise absenteeism from work. Pain can devastatingly affect the health-related quality of life of the individual and impede economic growth. Each day of absenteeism from work is costly to the employer, and pain continues incessantly, degrading the individuals ability to function. The response to pain may be due to a lack of knowledge which in turn creates maladaptive behaviours. It is unclear which pain attitudes and beliefs are sustaining absenteeism from work due to MSDs. Once the attitudes and beliefs are identified perhaps the knowledge gaps will be more observable, allowing clinicians to empower their patients better and create economic relief simultaneously. This study aims to ascertain whether or not pain attitudes and beliefs are at the foundation of the absenteeism dilemma in workers individuals with pain attributable to musculoskeletal disorders.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter involves an overview of the methodological approach and protocols implemented in this study while adhering to the research ethics. Braun & Clarke (2022) defines methodology as the research process that should produce helpful knowledge, account for the research process and explain explicitly specific to the project. Additionally, according to Gupta (2018), it is concerned with the principles and procedures that govern scientific research and would make it acceptable to the scientific community. These comprise the research approach, methods of data collection, sampling techniques, data collection tools, validity and reliability of the tools, data analysis and ethical considerations.

3.2 RESEARCH APPROACH AND DESIGN

This study used a sequential explanatory mixed methods approach and design to attain the research objectives. This method has been gaining rapid momentum in research over the last two decades, particularly in explaining behaviour that a purely quantitative approach would have ignored (Timans et al., 2019). Mixed method research uses a pragmatist paradigm with a transformative perspective that assumes knowledge is not neutral and offers critical realism because it integrates realist ontology with constructivist epistemology (Charmaz et al., 2018). Halcomb and Hickman (2015) argued that mixed methods research allows researchers to gain a deeper understanding of complex health issues that would be unachievable through a mono-method approach. According to Ivankova et al. (2006), in its basic form, this design involved the collection of quantitative data followed by the collection of qualitative data. The mixed-methods approach has become popularised within physiotherapy as it provides reasons for findings or specific outcomes through the participant's experience (Rauscher & Greenfield, 2009). Quantitative data for this study will be collected using a cross-sectional design to determine the prevalence of an outcome by using a representative sample to generalise findings (Omair, 2015). Qualitative data for this study will be collected using an exploratory design with semi-structured face-to-face interviews to understand the background of the initial responses of the quantitative phase (Mack et al., 2005). Following the research title and the objectives, mixed-method is the suitable approach as it enriches research findings and answers the study's objectives. This study specifically employed the sequential explanatory mixed-method design (see Figure 3.1).

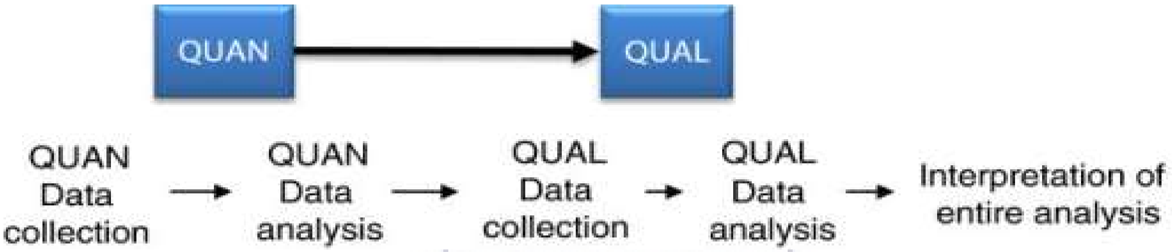

Fig 3.1 Sequential explanatory mixed methods design (Creswell & Plano Clark, 2007)

This design will provide more data about results from the earlier phase of data collection and analysis of study results of a defined population (Creswell & Plano Clark, 2007). It aids in clarifying the results through refinement and exploration of the general view given in the quantitative phase. This method allows the researcher to review and analyse the quantitative results and adjust the subsequent in-depth interview instrument to follow up on significant responses (Driscoll et al., 2007). Another advantage described by Fetters et al. (2013) is that the qualitative data can be used to assess the validity of the quantitative findings, and the quantitative (first) phase can refine the qualitative (second) phase and explain findings at the interpretation level of the study.

Creswell and Plano Clark (2007) posit that using quantitative and qualitative approaches together conveys an enhanced understanding of the given research problems than either approach alone. In this study, these two methods will be integrated during the interpretation/discussion phase of the study.

3.3 RESEARCH SETTING

The study was conducted in Nelspruit, South Africa. Nelspruit is part of the Mbombela Municipality, the capital of Mpumalanga Province and the gateway to the Kruger National Park (Lowvelder, 2017). It has a rich economic and cultural history and has significantly persevered against adversaries such as disease, pests and war (Lowvelder, 2017). The town is at the helm of major production of gold and coal mining, citrus farming, forestry and other agricultural pursuits. The town and the level of production of goods and services require an enormous healthy workforce to keep it in motion. The majority of the workforce comprises commercial cleaning, mining and metallurgy, forestry, farming, construction and engineering. Four private physiotherapy practices in Nelspruit attend to patients presenting with MSDs.

3.4 DATA COLLECTION METHODS

The data was collected in two distinct phases as outlined below:

3.4.1 QUANTITATIVE PHASE

Blaikie (2003) defines quantitative research as transforming aspects of social reality into numbers in various ways to draw answers from deductive reasoning. This is because deductive reasoning creates a view of the possible nature of a subject and eventually tests its accuracy. This study’s overall approach includes objectivity within its parameters. Bloomfield and Fisher (2019) describes objectivity as a perspective that strives to minimise bias in the standardised outcome measures and parametric tests. The analysed and quantifiable results should be generalisable to the population being studied. Achieving this is an attempt to ascertain veracity which will apply to similar situations.

a) Study Population and Sample

The study population includes patients attending the four physiotherapy practices in Nelspruit that meet the inclusion criteria. The researcher used a convenience sampling strategy to recruit participants for the study. Convenience sampling was chosen as these participants meet the inclusion criteria of this study. The staff of physiotherapy practices were trained in identifying and inviting participants that met the inclusion criteria. All patients who attended treatment at the physiotherapy practices, both new and follow-up, were invited to participate in the study.

South Africa has a 15% absenteeism rate on a typical working day, with 40% of this having no diagnosis (OCSA, 2014). The population in Mbombela is over 100,000, it is expected that at least 7,500 people could be absent on a typical working day, making the required sample attainable. At a 5% margin of error and 95% confidence interval, a minimum sample of 380 participants according to the Yamane formula (Israel, 1992) [n= $\frac{N}{1+N(e)^2}$ n stands for sample, N for study population, e is a constant equal to 0.05], have to complete the questionnaire to make the results generalisable to the study population. For a self-administered questionnaire with an option that it can be completed online for which there is a prior relationship with the recipients, a response rate of 50-60% is considered highly successful but 40-50% is more conservative than safer (Nulty, 2008). There were 380 questionnaires issued, with 122 returned, but 12 were excluded as they were incomplete. A partial explanation for the low response rate was research sites reporting that most eligible participants took the questionnaire home for completion to spend less time at the practice in line with their COVID-19 regulations.

b) Inclusion and Exclusion Criteria

Inclusion

- All individuals working within the Mbombela region of South Africa and aged 18-65,
- Employed full time (40 or more hours worked per week) or part time (at least 30 hours worked per week)
- Currently experiencing pain due to an MSD.
- The diagnosis of an MSD was determined by the first-line practitioner (Physiotherapist, Doctor, Medical Specialist) that attended to or referred the patient to one of the study sites.

Exclusion

- Individuals who have undergone surgery related to their condition in the last two years or,
- Presenting with a neurological disorder (stroke, spinal cord injury, traumatic brain injury, other autoimmune diseases). These individuals were excluded as a pathology associated with the central or peripheral nervous system alters pain perception,
- Individuals who do not fall within the study age group.
- Not working full time or part time.

c) Data Collection Instrument

Data was collected using a self-administered questionnaire (Appendix C). A license from EuroQol was required to use the EQ-5D-5L. The Survey of Pain Attitudes is freely available to use online although hard copy packs with guides on its application is available for purchase. The self-administered questionnaire consisted of three sections and are described below:

Section A consisted of sociodemographic information, i.e. age, gender, the highest level of education, income earners, nature of painful condition and number of days absent from work.

Section B consists of the EQ-5D-5L (EuroQol Registration number 48465) that examines health-related quality of life relating to mobility, self-care, usual care, pain/discomfort, and anxiety/depression (EuroQol, 2017). It provides scores for different health-related dimensions and an index value to assess health status, making it useful in health economic analyses.

Section C consisted of the Survey of Pain Attitudes-revised (SOPA-R) that assesses adaptive and maladaptive behaviours concerning pain (Jensen et al., 2004). This survey consists of seven domains: control, disability, harm, emotion, medication, solicitude and medical cure. The person assessed indicates agreement or disagreement with each of the four assertions in a 5-score likert-style scale. There are neither cut points nor right or wrong answers but a guideline for the most desirable answers.

The research instrument was translated to Afrikaans and SiSwati by an independent person and translated back into English by a home language Afrikaans and another home language SiSwati speaker. The Afrikaans and SiSwati versions were reviewed by healthcare and non-healthcare professionals for accuracy and comprehensibility. This is method is compliant with WHO translation protocol that requires collaborative approach to developing translated questionnaires from English to the native language of the target population (Kalfoss, 2019)

d) Reliability and validity of the scales

Reliability refers to the degree of consistency or accuracy with which an instrument measures the attribute it has been designed to measure (Polit & Hungler, 2013). Validity refers to the extent to which an empirical measure accurately reflects the concept it is intended to measure (Sutherland, 2017). The K statistics of the EQ-5D-5L was mostly rated with fair to moderate agreement (K = 0.541) (Buchholz et al., 2018). The EQ-5D-5L is valid when assessing musculoskeletal conditions with a correlation coefficient >0.50 (Marshall et al., 2015). The SOPA-R validity in patients with chronic pain had alpha-scores ranging from 0.58 – 0.85 across the seven domains (Jensen 2000). It was also used in a previous study in which (Jensen et al., 2000) found that attitudes and beliefs were statistically significant and interrelated regarding their illness or pain (Tarimo & Diener, 2017). The content validity of the developed instrument was assessed through peer review by a panel of experts, while the implementation of the pilot study assessed face validity.

e) Pilot study

A pilot study aims to provide insight for the researcher and assist in identifying potential problems in the research process (Van Teijlingen & Hundley, 2002). It was conducted to establish its face validity, how long it will take to complete, and the questions' clarity to the participants. Participants in the pilot study were also tasked to provide comment on the clarity of the questions and if any were difficult to answer and provide an alternative version of the question. The questionnaire was available in English, SiSwati and Afrikaans. Ten (10) patients who met the inclusion criteria of the research study were asked to complete the questionnaire after written informed consent was obtained from them. The participants completed the questionnaire in their preferred language and all available languages were used. These participants were not included in the final research study. Pertinent issues the pilot study participants identified were typographical errors within the research instrument and difficulty comprehending specific questions in the Afrikaans and SiSwati languages. The typographical errors were corrected and the respective translators reviewed the Afrikaans and SiSwati versions of the research instruments. A HCP was provided with the updated Afrikaans and SiSwati versions who is fluent in English and Afrikaans and then a second HCP fluent in English and SiSwati to assess clarity and comprehension. The reviewed versions were tested with the participants who indicated difficulty four weeks after completing it and found no problem understanding the meaning of the questions and then answering the questions.

f) Data collection procedure

Ethical considerations were implemented (see 3.5), and then a self-administered questionnaire (Appendix C) was completed by the patients on the premises of the private practices. The researcher trained healthcare professionals in the administration of the survey at each research site. The training included education on what pain attitudes and beliefs are and their relationship to MSDs. Identifying and recruiting participants based on the inclusion and exclusion criteria. Training on safety and ethics associated with research on human beings. A reference guide (Appendix F) was also given to the staff of the private practices to answer frequent questions identified in the pilot study. The researcher was telephonically and via email available for all questions from participants and study sites during data collection.

g) Data Analysis

Once the data was coded, it was analysed by the researcher using the Statistical Package for Social Sciences (SPSS) version 27. Descriptive statistics were employed to summarise the data on the sociodemographic information of the participants, expressed as percentages, means and standard deviations and presented in frequency tables. Continuous variables were expressed as means (SD) such as SOPA-R scoring, while categorical variables such as absenteeism rate, EQ-5D-5L scoring were expressed as frequencies and percentiles. Pearson's correlation coefficient test was used to determine the correlation between the pain attitudes and beliefs score and absenteeism and health-related quality of life (HRQoL). Furthermore, significant differences were tested using the Chi-square test (categorical variables) to determine if they are related or independent in line with the study aims and objectives. Student t-test was applied to continuous variables to compare means that will achieve the study's objectives. These were tested on SOPA-R scoring against sociodemographic factors (age, income status, IOD, area of concern) and EQ-5D-5L scoring against SOPA-R scoring, residential status, income status, duration of symptoms and age. The results such as income status, area of concern, SOPA-R scoring, EQ-5D-5L scoring, absenteeism rate, area of concern and duration of symptoms are presented in tables and graphs (histogram, bar and/ or pie charts). Statistical significance is set at $p<0.05$.

3.5 QUALITATIVE PHASE

a) Population and sampling

The population for this phase included all who participated in the study's quantitative phase. The sample was sought from the participants that completed the questionnaire in the quantitative phase of the study. Purposive sampling was used to select participants for this phase. Whitehead and Whitehead (2015) state that purposive sampling involves recruiting participants based on pre-selected criteria relevant to the study's aims and objectives. In equal consideration, the participants chosen must be different as this will result in a good qualitative study with a complex picture of the phenomena, as indicated by Creswell and Plano Clark (2018). There were six (6) semi-structured interviews conducted when saturation was reached. The candidates were selected according to the algorithm in (Figure 3.2) where clinical range for maladaptive belief equals a score of ≥ 16 of 20 and adaptive beliefs ≤ 4 of 20.

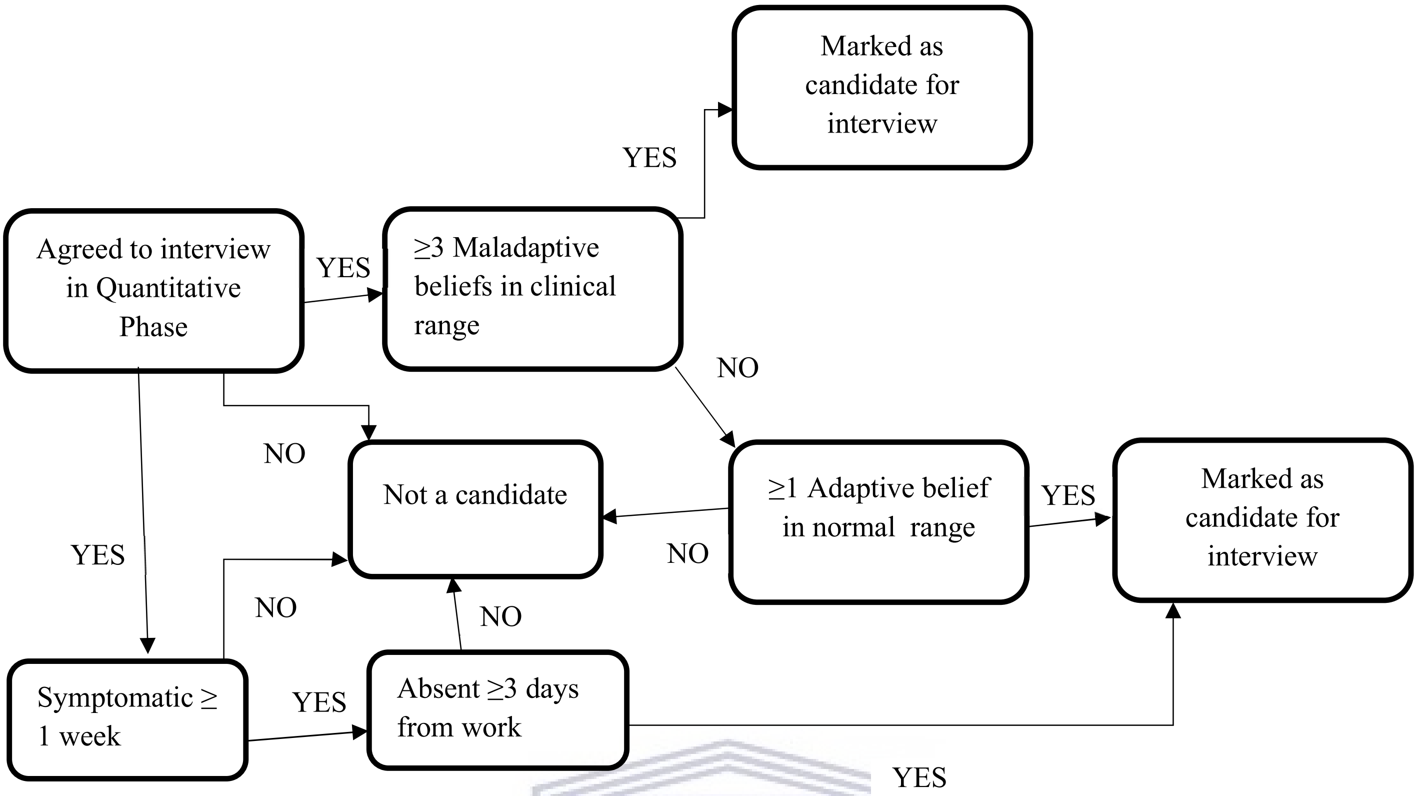

Figure 3.2 Purposive Sampling algorithm

Twenty-five (25) candidates were identified out of 110 participants from the quantitative phase for the interview. The candidates were contacted in the order that they appeared in the data capturing spreadsheet until the six semi-structured were completed until saturation was reached after the sixth interview.

b) Inclusion and Exclusion Criteria

Inclusion

- All workers who participated in the quantitative phase of data collection.

Exclusion

- All workers who did not participate in the quantitative phase of the study.
- All workers who did not consent to being interviewed during the quantitative phase of the study.

c) Data collection instrument

A semi-structured interview guide (Appendix E) was used. The interviews were conducted in English, Afrikaans and where participants prefer it to be done in Siswati an interpreter was used. The interpreter was trained on the purpose and participants of the research project. Additionally, interview techniques were also provided to ensure all possible responses or gaining clarity from participants was achieved. The interview guide consisted of open-ended questions which allowed respondents to freely express themselves as they described their experience with pain (past and present), personal strategies in managing pain and the impact of pain on life roles. Semi-structured interviews follow a schedule of predetermined topics but still allow for unanticipated responses or issues that emerge through open-ended questioning (Ryan et al., 2009). A probing technique was used to ensure that no information was missed (Britten, 1995). Interviews were recorded on two devices, and the researcher also recorded field notes. The number of interviews continued until saturation was reached, namely when information is repeated, and no new information can be obtained if the interview continues (Polit & Beck, 2010). The semi-structured interview guide allowed the research to maintain consistency in data extraction from each participant as the same questions were asked.

d) Data collection procedure

A convenient place and time for the participants was arranged before data collection. Written consent was obtained from the participant to allow an interpreter and be audio-taped during the interviews. Each participant received the interview schedule a week before their interview date to prepare extensive answers. Before the interview started each participant was reminded of the aims and objectives of the interview and to elaborate as extensively as possible on the meaning of the answers to questions. Interviews lasted 30min to an hour and were recorded to capture all key points (Jamshed, 2014). To enhance interview efficacy, the following advice of

McGrath et al. (2019) were applied: Preparation, simple to complex questions, establishing rapport with a person-centred approach, attentive listening and preparedness for unanticipated emotions.

Due to the ongoing impact of the COVID-19 pandemic the following conditions were applied while interviews were conducted. All participants were given the option of the interview being conducted on a virtual platform. Where it needed to be done in person, the researcher, translator, participant, and assistants completed a COVID-19 symptom pre-screening assessment on the day of the in person interview. A well-ventilated room was selected for the interview. The researcher, interpreter, participant, and research assistant performed hand hygiene before and after the interview and materials for this were provided. Masks were worn by those participating in the interview process with a 1.5m distance between persons.

e) Trustworthiness of the qualitative data

Trustworthiness relates to the validity of the data from which the researcher has collected and drawn conclusions to enhance rigour and quality (Cope, 2014). Qualitative research achieves this through credibility, transferability, dependability and confirmability (Polit & Beck, 2010). Anney (2015) affirms that there must be confidence in the truth of the research findings, known as credibility and transferability, which is the degree to which the results can be transferred to other contexts. Additionally, there is dependability which refers to the stability of findings throughout data collection and confirmability by demonstrating that the researcher's interpretations are clearly derived from the data (Anney, 2015).

Credibility in this study was attained through prolonged engagement with the participants. This technique provides the researcher with more insight into the study context. It enhances the trust in the data provided by the participants as there is a deeper understanding of societal and cultural contexts (Anney, 2015). Member checking was performed by providing the transcribed verbatim drafts to the respective participant to identify discrepancies and a colleague for peer review (Nowell et al., 2017). This action further diminishes researcher bias and allows the participants to be the commanding voice behind the data presented (Birt et al. 2016).

Transferability will be achieved by thick description and purposive sampling techniques as discussed in (a). A thick description of the settings in which the data was obtained and the criteria to get the data is necessary, so conclusions made by the researcher are transferable to other settings or populations (Hadi, 2016).

Dependability was achieved by ensuring that the audit trail consisting of the methodology, original transcript, data analysis documents, fields' notes and comments from member checking will be transparent so that any researcher that wants to adapt the process to its own setting could do so. To which Nowell et al. (2017) argue, post-interview reflections were also performed, providing clarity and insight to the audit trail. A code recode strategy was also implemented to affirm code agreement at the initial coding process of data analysis as proposed by Anney (2015).

Confirmability, is concerned with the neutrality of the data and verifies that interpretations are grounded in the data (Korstjens & Moser, 2018). This was achieved by providing an audit trail, post-interview reflections, coding reflections and refining of themes. A colleague who was not involved in the study was provided with the verbatim transcripts, analysis and process notes and summaries of the results for her opinion. She has experience in Thematic analysis and transcribing interview data. Direct quotations were also included in the discussion section to demonstrate that the findings were a true reflection of the data and not the researcher's opinion.

f) Data analysis

An independent person transcribed data from the audiotapes verbatim to produce a manuscript. She has experience in transcribing corporate meetings where more than two people are speaking. According to Hammersly (2010) verbatim implies that the transcribed data includes every utterance or interjection to maintain the culturally specific context imperative to health research. To ensure study aims and objectives were achieved a set of Transcription Instructions (Appendix H) that included a transcription key was provided to the transcriptionist. Nascimento and Steinbruch (2019) affirms that the study's aims, objectives and purposes must be discussed with the transcriptionist to improve the accuracy of the transcribed data. After transcriptions were completed, the researcher reviewed them again and compared to field notes taken during the interviews and verified for accuracy. Thematic analysis was done on two levels namely; individual data and across all the participants. Atlas.Ti 9 was used to perform Thematic Analysis. Atlas.Ti 9 is a qualitative data analysis software that allows for complex coding structures while saving all quotations associated with each code. Braun and Clarke (2020) states that thematic analysis is a reflexive process used to extract meanings and concepts from data, including isolating, examining, and recording patterns or themes.

The original process, as given by Braun and Clark (2006) was followed, namely familiarisation with the data set, generation of initial codes, searching for themes, reviewing the themes, and defining and naming themes. The researcher applied deductive reasoning and focused on themes that emerged during data analysis. The processed data was presented to the researcher’s peers who are healthcare professionals and have experience with thematic analysis for critique and verification of the coding, categorisation and arrangement of the themes. The final themes selected was sent to the supervisor for further verification. Finally, the discussion was done with the inclusion of some of these themes from the original data collected following the study aims and objectives. Direct quotations were used under each theme to represent the participants and demonstrate that the information presented was by the participants and not the researcher's opinions.

3.6 ETHICS CONSIDERATIONS

Research ethics serves to protect the rights of participants and to prevent unnecessary harm. Thus, discussing the steps taken to ensure this is vital (McKenna & Gray, 2018). Firstly, approval was sought from the University of the Western Cape’s Biomedical Research Ethics Committee (BMREC) (Appendix D). Further permission was sought from the Practice Owners (Appendix G). The aim and objectives of the study were explained and made available to all participants in the form of an information sheet (Appendix A). Participants were advised within the information sheet to ask questions on anything that was not clear before providing consent. The researcher was available via email and mobile phone regarding questions and these details were available on the information sheet. Informed, written consent (Appendix B) will be obtained from each participant before data collection commenced. Participants had the option of consenting to the quantitative and qualitative phases; however the qualitative phase was optional but highly recommended by the researcher to achieve the aims and objectives of the study. All the documentation was available in English, Afrikaans and Siswati. Included in all language options were the aims, objectives, risks, and benefits of the study. This process aligns with thoughts of Halkoaho et al. (2015) regarding research in multi-cultural contexts where personal decision making is paramount in protecting the autonomy of human beings. Participation is voluntary and participants were allowed to withdraw from the study at any time with no consequences. Anonymity was assured using a code and not the patient’s name on the questionnaire. Participants of the qualitative phase were advised not to use names but rather their profession (nurse/doctor) or relationship (brother, employer), but deidentification was performed during the transcription of the interviews. Information obtained from the questionnaires and participants was for the study only and was handled with confidentiality. The data collected was stored in a locker only accessible to the researcher while analysed data was stored on a password-protected computer of which only the researcher had access to. All data will only be discarded after five years. Pseudonyms were used to protect participants' identities when results are published. Minimal risks such as physical or psychological harm were expected in the study. Any sensitive issues or questions that arose from the study and could affect the participant were observed by the researcher and staff members at the research sites and carefully handled or referred to an expert for appropriate attention. The results of the study were made available to all participants and the relevant persons including practice owners at research sites.

3.7 SUMMARY OF THE CHAPTER

This study used a sequential exploratory mixed method approach incorporating a quantitative and qualitative data collection and analysis phase. A total of 380 questionnaires were issued but only 122 responses were received and 110 were eligible to be included in the study. Purposive recruitment sampling was then used to identify six (6) participants for the second phase of the study. Permission was obtained from all the relevant authorities to conduct the study. Data was collected using questionnaires for phase one and SPSS version 27 was used to perform data analysis. One-to-one interviews were conducted for data collection in phases two, and thematic analysis was followed for analysis. Validity and reliability of the research instrument in phase one was observed and trustworthiness accounted for during phase 2. Participants were fully aware of their right to withdraw from the study without any implications. The quantitative and qualitative analysis results are presented in Chapters 4 and 5 respectively.

CHAPTER FOUR

QUANTITATIVE RESULTS

4.1 INTRODUCTION

As indicated in Chapter 3, the present study employed a sequential mixed method approach. Therefore, the results are presented in two phases, the quantitative phase (Chapter 4) followed by the qualitative phase (Chapter 5).

Chapter four presents the statistical analysis which sought to answer the first five objectives of the present study. The objectives to be answered in this chapter are 1) pain attitudes and beliefs of workers with MSDs, 2) days absent from work of workers with MSDs, 3) HRQoL of workers experiencing pain attributable to MSDs, 4) the relationship between pain attitudes and beliefs and absenteeism from work of workers with pain attributable to MSDs and 5) the relationship between pain attitudes and beliefs and workers' quality of life with pain attributable to MSDs. The study employed convenience sampling. Generalisation of the results would be possible by a sample of at least 380 respondents. Unfortunately a response rate of 28.9% (110/380) was obtained as there was low attendance rate at data collection sites due to the COVID-19 pandemic. As well as low referral and self-referral to data collection sites.

4.2 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE PARTICIPANTS (n=110)

The total study sample comprised of 110 workers with male (n = 57, 51.8%) compared to the (n = 53, 48.2%) female participants. Age of the study sample ranged between 18 and 60 years and above. More than half of the participants (n = 71, 64.6%) were in the age category aged 26-45 years. In terms of level of education, 49 participants (44.5%) completed Matric/Grade 12, followed by 27.3% (n=30) Diploma/Degree holders. The majority of participants 42.7% (n=47) came from rural areas as indicated in Table 4.1 below.

Table 4.1 Sociodemographic profile of the participants (n = 110)

Characteristic	Total Population n (%)	Male n (%)	Female n (%)
Gender	110 (100)	57(51.8)	53(51.8)
Age categories			
18-30	23 (20.9)	15 (13.6)	8 (7.3)
31-40	40 (36.4)	21 (19.1)	19 (17.3)
41-50	25 (22.7)	13 (11.8)	12 (10.9)
51-60	16 (14.5)	8 (7.3)	8 (7.3)
≥60	6 (5.5)	0 (0)	6 (5.5)
Level of education			
Grade 7	27 (24.5)	18 (16.4)	9 (8.2)
Matric/Grade 12	49 (44.5)	30 (27.3)	19 (17.3)
Diploma/Degree	30 (27.3)	7 (6.4)	30 (27.3)
Post-Graduate	4 (3.6)	2 (1.8)	2 (1.8)
Residential area			
Rural	47 (42.7)	30 (27.3)	17 (15.5)
Urban	34 (30.9)	12 (10.9)	22 (20)
Location[1]	29 (26.4)	15 (13.6)	14 (12.7)
Marital status			
Never Married	55 (50)	32 (58.2)	23 (41.8)
Married	48 (43.7)	22 (45.8)	26 (54.2)
Divorced	7 (6.3)	3 (42.9)	4 (57.1)
Income earners in the household			
One	46 (41.8)	24 (21.8)	22 (20)
Two	50 (45.5)	22 (20)	28 (25.5)
More than two	14 (12.7)	11 (10)	3 (2.7)

[1] A colloquial term referring to a township which in South Africa is historically a residential area allocated to non-whites

4.2 MUSCULOSKELETAL DISORDER PROFILE OF THE PARTICIPANTS

The participants provided details of their MSDs with 41.8% (n= 46) having experienced a MSD associated with the lower limbs. With regards to pain, the majority of the participants (n= 79; 71.8%) were experiencing acute pain (≤ 2 months) and only 28.2% (n=31) experiencing chronic pain (≥ 3 months) due to MSDs. Absenteeism from work due to MSDs occurred amongst 70% (n=77) of the participants with two (2) participants having more than a year workday lost. Midpoint coding was used to estimate workdays lost and the question was listed as a category as not all workers can remember the exact number of days they were no working. Based on this sample it is estimated that between 800 – 1200 workdays were lost due to MSDs. The majority of the participants (n=78, 70.9%) developed an MSD as a result of an injury on duty (IOD), as indicated Table 4.2 below.

Table 4.2 Injury profile of participants (n = 110)

Characteristic	Total Population n (%)	Male n (%)	Female n (%)
Area of concern			
Head/Neck	13 (11.8)	7 (6.4)	6 (5.5)
Upper Limb	23 (20.9)	17 (15.5)	6 (5.5)
Spine and Pelvis	28 (25.5)	12 (10.9)	16 (14.5)
Lower Limb	46 (41.8)	21 (19.1)	25 (22.7)
Duration of pain			
Less than 2 weeks	47 (42.7)	30 (27.3)	17 (15.5)
2 weeks to 2 months	32 (29.1)	19 (17.3)	13 (11.8)
2 months to 1 year	9 (8.2)	4 (3.6)	5 (4.5)
Over a year	22 (20)	4 (3.6)	18 (16.4)
Absenteeism from work			
0 days	33 (30)	15 (13.6)	18 (16.4)
Less than 1 week	41 (37.3)	22 (20)	19 (17.3)
Less than 1 month	24 (21.8)	13 (11.8)	11 (10)
1-6 months	7 (6.4)	3 (2.7)	4 (3.6)
6 months to 1 year	3 (2.7)	2 (1.8)	1 (0.9)
Over a year	2 (1.8)	2 (1.8)	0 (0)
Injury on duty			
Yes	78 (70.9)	49 (44.5)	29 (26.4)
No	32 (29.1)	8 (7.3)	24 (21.8)

4.3 HEALTH-RELATED QUALITY OF LIFE OF THE PARTICIPANTS (n=110)

The participants answered the EQ-5D-5L questionnaire to determine their HRQoL. The questionnaire is reliable and valid for the population group being assessed (Marshall et al, 2015). The participants rated their level of difficulty in five health domains (Mobility, Self-care, Usual Activities, Pain/Discomfort, Anxiety/Depression) and their overall health on a scale out of 100. The level of difficulty was dichotomised into ‘No problems’ and ‘Any problems’ as indicated in Table 4.3 below. Any problems would be answered if one of questions 2-5 within each health domain were marked by the participant. The responses to EQ-5D-5L were dichotomised as it could not be converted to an index value because there is no value set available for South Africa.

Table 4.3 Health Related Quality of Life of participants (n=110)

Domain	**Total Population** n (%)	**Male** n (%)	**Female** n (%)
Health Scale: Mean = 69.68 (SD±21.15)			
Mobility			
No Problems	38 (34.5)	19 (17.3)	19 (17.3)
Any problems	72 (65.5)	38 (34.6)	34 (30.9)
Self-care			
No Problems	63 (57.3)	29 (26.4)	34 (30.9)
Any problems	47 (42.7)	28 (25.4)	19 (17.3)
Usual Activities			
No Problems	25 (22.7)	8 (7.3)	17 (15.5)
Any problems	85 (77.3)	49 (44.6)	36 (32.7)
Pain/Discomfort			
No Problems	3 (2.7)	2 (1.8)	1 (0.9)
Any problems	107 (97.3)	55 (50)	52 (47.3)
Anxiety/Depression			
No Problems	38 (34.5)	20 (18.2)	18 (16.4)
Any problems	72 (65.5)	37 (33.7)	35 (31.8)

What stands out in Table 4.3 is the majority of the population has been impacted in all domains of health except Selfcare with only 42.7% (n=47) reporting problems. As expected for this study population, the Pain/Discomfort ranked the highest with 107 (97.3%) of the participants affected. The second highest domain for reported problems was Usual Activities with 85 (77.3%) while 72 participants (65.5%) were affected in both Mobility and Anxiety/Depression domains. The results thus displays that pain from MSDs is having a negative health and functional impact which is confirmed by the mean score on the health scale of 69.68 (SD±21.15). The results of the domains are also represented in Figure 4.1.

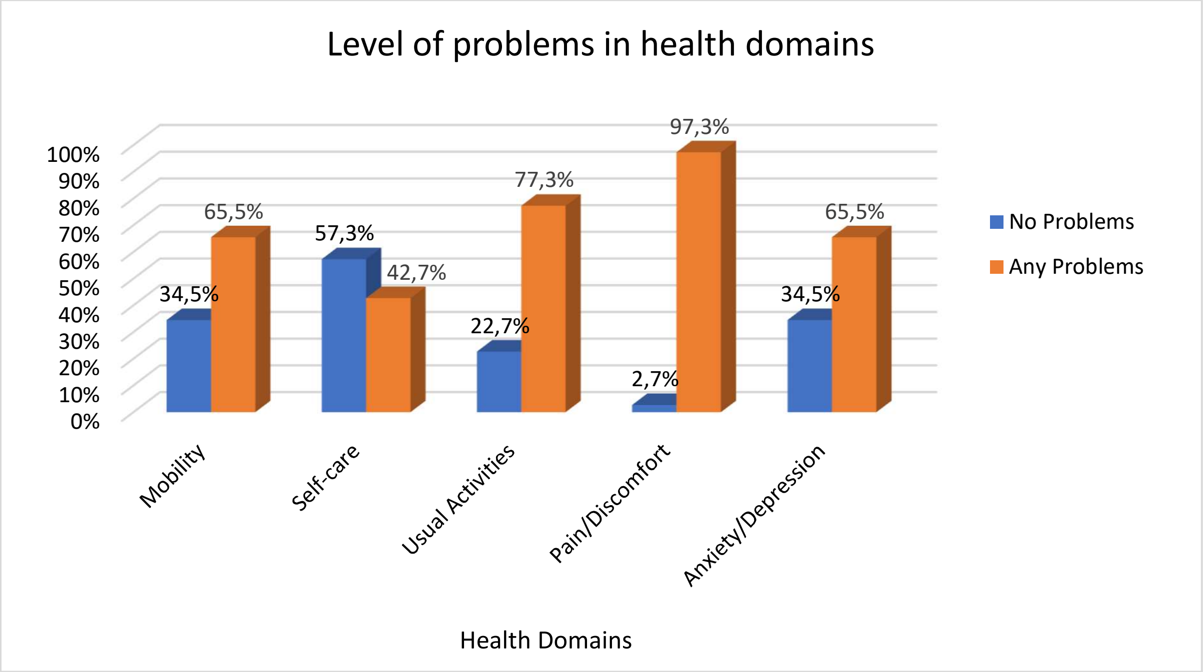

Figure 4.1 Level of problems per health domain (n=110)

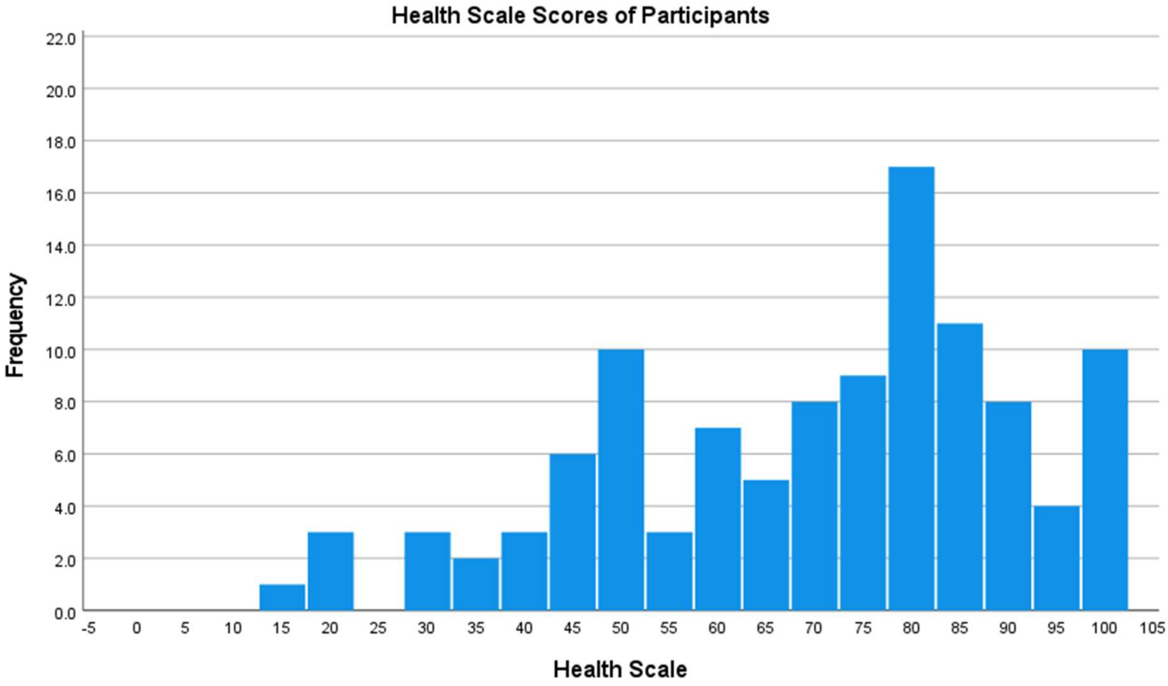

Figure 4.2 Health scale of participants (n=110)

4.4 PAIN ATTITUDES AND BELIEFS OF PARTICIPANTS (n = 110)

The participants answered the SOPA-R questionnaire where they rated their agreement with the statement using a 5-point Likert Scale ranging from very untrue to very true across 35 statements. The maximum scores for each domain was 20. To obtain the true score for Adaptive Beliefs (Control and Emotion) of the SOPA-R a reverse score is needed where 4 – rating given by the participant is applied to each statement. Table 4.4 below indicates the total range scoring for male and female participants within each domain. What is striking is that only the domain Solicitude showed a majority of 45.4% within Clinical Range. Normal Range majorities were shown in the domains of Control (53%), Emotion (47.3%), Harm (62.7%) and Medical Cure (63.4%). This left the majority for Sub-clinical Range within the domains of Disability (58.2%) and Medication (46.4%) as shown in Table 4.4 below.

Table 4.4 SOPA-R Range scores per clinical range (n = 110)

Domain	Total Population n (%)	Male n (%)	Female n (%)
Control			
Normal Range	60 (54.5)	31 (28.2)	29 (26.3)
Sub-clinical Range	42 (38.2)	23 (20.9)	19 (17.3)
Clinical Range	8 (7.3)	3 (2.7)	5 (4.6)
Emotion			
Normal Range	55 (50)	29 (26.4)	26 (23.6)
Sub-clinical Range	34 (30.9)	20 (18.2)	14 (12.7
Clinical Range	21 (19.1)	8 (7.3)	13 (11.8)
Disability			
Normal Range	22 (20)	7 (6.4)	15 (13.6)
Sub-clinical Range	64 (58.2)	39 (35.5)	25 (22.7
Clinical Range	24 (21.9)	11 (10)	13 (11.9)
Harm			
Normal Range	71 (64.6)	35 (31.9)	36 (32.7)
Sub-clinical Range	33 (30)	17 (15.5)	16 (14.5)
Clinical Range	18 (16.4)	16 (14.6)	2 (1.8)
Medication			
Normal Range	47 (42.7)	22 (20)	25 (22.7)
Sub-clinical Range	51 (46.4)	29 (26.4)	22 (20)
Clinical Range	12 (10.9)	6 (5.5)	6 (5.5)
Solicitude			
Normal Range	42 (38.2)	18 (16.4)	26 (21.8)
Sub-clinical Range	28 (25.5)	15 (13.7)	13 (11.8)
Clinical Range	40 (36.4)	26 (23.7)	14 (12.7)
Medical Cure			
Normal Range	71 (64.6)	38 (34.6)	33 (30)
Sub-clinical Range	37 (33.6)	18 (16.4)	19 (17.2)
Clinical Range	2 (1.8)	1 (0.9)	1 (0.9)

Table 4.5 SOPA-R: mean scores per domain (n=110)

Dimension	Minimum	Maximum	Mean (M)	Std. Deviation (SD)
Control	0	20	10.84	4.11
Emotion	0	19	9.66	4.84
Disability	0	20	12.73	3.67
Harm	0	20	8.99	4.02
Medication	0	17	10.85	3.46
Solicitude	0	20	11.55	6.65
Medical Cure	0	20	9.41	3.34

Table 4.5 above shows the mean score for each domain of the SOPA-R. Control (M = 10.84) Harm (M = 8.99) and Medical Cure (M = 9.41). scored within normal range. Participants scored for the domains of Emotion (M = 9.66), Disability (M = 12.73), Medication (M = 10.85) and Solicitude (M = 11.55) within the sub-clinical range. The SOPA-R clinical ranges of the participants are also represented in Figure 4.3.

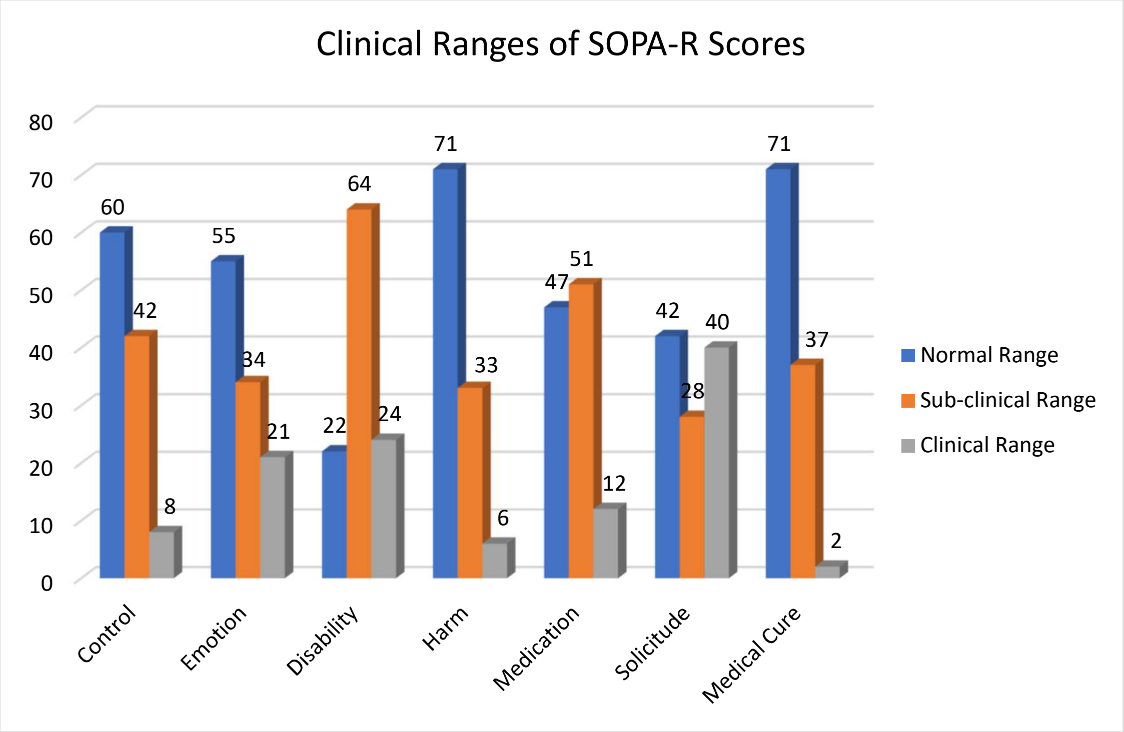

Figure 4.3 SOPA-R Scores according to clinical ranges of participants (n=110)

4.5 RELATIONSHIP BETWEEN PAIN ATTITUDES AND BELIEFS AND HRQOL (n=110)

Independent T-tests were used to assess how the domains of the SOPA-R affected HRQoL of participants. Firstly what is notable how Emotion is statistically significant in the Health domains of Mobility ($p = <0.001$, $r =0.32$), Selfcare ($p = 0.005$, $r = 0.23$), Usual activities ($p = 0.005$, $r = 0.26$) and Anxiety/Depression ($p = <0.001$, $r = 0.48$) shown in Tables 4.6, 4.7, 4.8 and 4.9. The relationship of Emotion to these health domains are positive but only a small to medium effect size. A significant association was also found between Mobility and Harm ($p = 0.007$, $r = 0.23$) as well as with Solicitude ($p = <0.001$, $r = 0.32$), Selfcare ($p = 0.005$, $r = 0.23$) shown in Table 4.6 and Table 4.7. Harm and Solicitude showed a positive relationship and strong correlation with a medium effect size. Control was the only other domain to significantly affect Selfcare with p-value = 0.037, $r = 0.2$, this is positive. Medication and Solicitude beliefs showed a statistically significant effect within the health domains of Usual Activities and

Pain/Discomfort with p-values of 0.002 (r = 0.29); 0.003 (r = 0.23); p-value = 0.21 (r = 0.22); and p-value = 0.046 (r = 0.19) respectively as shown in Table 4.8 and Table 4.9. These relationships were positive but their correlations remain weak due to the small effect size. Solicitude also showed a positive relationship with strong correlation and medium effect size to Anxiety/Depression with p-value = <0.001 (r = 0.39) as shown in Table 4.10.

Table 4.6 Relationship between HRQoL Mobility and SOPA-R Scores (n=110)

MOBILITY		**Mean**	**Std. Error Mean**	**t**	**df**	**p-value**	**r**
Control	**No Problems**	11.13	.76	.55	110	.586	0.1
	Any Problems	10.68	.45				
Emotion	**No Problems**	7.55	.75	-3.49	110	<.001**	0.32
	Any Problems	10.78	.54				
Disability	**No Problems**	12.83	.69	-.42	110	.339	0.04
	Any Problems	12.83	.40				
Harm	**No Problems**	7.71	.65	-2.49	110	.007**	0.23
	Any Problems	9.67	.46				
Medication	**No Problems**	9.97	.62	-1.96	110	0.26	0.19
	Any Problems	11.32	.376				
Solicitude	**No Problems**	9.42	1.10	-2.49	110	.007**	0.23
	Any Problems	12.67	.75				
Medical Cure	**No Problems**	8.97	.60	-.99	110	.162	0.09
	Any Problems	9.64	.37				

** = statistically significant at <0.05

Table 4.6 shows that Mobility has a significant relationship with Emotion (p = <0.001); Harm (p = 0.007) and Solicitude (p = 0.007) respectively.

Table 4.7 Relationship between HRQoL Selfcare and SOPA-R Scores (n=110)

SELFCARE		Mean	Std. Error Mean	t	df	p-value	r
Control	**No Problems**	11.54	.528	2.11	110	.037**	0.2
	Any Problems	9.89	.561				
Emotion	**No Problems**	8.56	.615	-2.87	110	.005**	0.23
	Any Problems	11.15	.644				
Disability	**No Problems**	12.81	.460	.27	110	.787	0.03
	Any Problems	12.62	.545				
Harm	**No Problems**	9.43	.560	1.33	110	.187	0.13
	Any Problems	8.40	.483				
Medication	**No Problems**	10.32	.456	-1.91	110	.059	0.18
	Any Problems	11.57	.456				
Solicitude	**No Problems**	10.51	.911	-1.92	110	.058	0.18
	Any Problems	12.94	.528				
Medical Cure	**No Problems**	9.41	.561	.013	110	0.989	0.001
	Any Problems	9.40	.615				

** = statistically significant at <0.05

Table 4.7 shows that Selfcare has a significant relationship with Control (p = <0.037) and Emotion (p = 0.005) respectively.

Table 4.8 Relationship between HRQoL Usual Activities and SOPA-R Scores (n=110)

USUAL ACTIVITIES		**Mean**	**Std. Error Mean**	**t**	**df**	**p-value**	**r**
Control	**No Problems**	11.04	.994	.28	110	.78	0.01
	Any Problems	10.78	.418				
Emotion	**No Problems**	7.32	.828	-2.84	110	.005**	0.26
	Any Problems	10.35	.525				
Disability	**No Problems**	11.92	.915	-1.25	110	.231	0.12
	Any Problems	12.96	.364				
Harm	**No Problems**	8.12	.849	-1.24	110	.219	0.12
	Any Problems	9.25	.427				
Medication	**No Problems**	9.04	.780	-3.1	110	.002**	0.29
	Any Problems	11.39	.342				
Solicitude	**No Problems**	8.08	1.470	-3.01	110	.003**	0.23
	Any Problems	12.56	.663				
Medical Cure	**No Problems**	9.20	.891	-.35	110	.724	0.03
	Any Problems	9.47	.322				

** = statistically significant at <0.05

Table 4.8 shows that Usual Activities has a significant relationship with Emotion (p = 0.005); Medication (p = 0.002) and Solicitude (p = 0.003) respectively.

Table 4.9 Relationship between HRQoL Pain/Discomfort and SOPA-R Scores (n=110)

PAIN/ DISCOMFORT		Mean	Std. Error Mean	t	df	p-value	r
Control	**No Problems**	13.00	2.08	.92	110	.358	0.09
	Any Problems	10.78	.4				
Emotion	**No Problems**	6.67	2.67	-1.09	110	.279	0.1
	Any Problems	9.75	.47				
Disability	**No Problems**	9.67	1.20	-1.43	110	.144	0.15
	Any Problems	12.81	.36				
Harm	**No Problems**	9.00	1.53	0.004	110	.997	negligible
	Any Problems	8.99	.39				
Medication	**No Problems**	6.33	1.2	-2.34	110	.021**	0.22
	Any Problems	10.98	.33				
Solicitude	**No Problems**	4.00	4	-2.02	110	.046**	0.19
	Any Problems	11.76	.63				
Medical Cure	**No Problems**	11.00	4.93	.83	110	.406	0.1
	Any Problems	9.36	.31				

** = statistically significant at <0.05

Table 4.9 shows that Pain/Discomfort only has a significant relationship with Medication (p = <0.021) and Solicitude (p = 0.046).

Table 4.10 Relationship between HRQoL Anxiety/Depression and SOPA-R Scores (n=110)

ANXIETY/ DEPRESSION		Mean	Std. Error Mean	t	df	p-value	r
Control	**No Problems**	11.24	.798	.74	110	.46	0.01
	Any Problems	10.63	.428				
Emotion	**No Problems**	6.50	.695	-5.64	110	<.001**	0.48
	Any Problems	11.33	.503				
Disability	**No Problems**	13.08	.598	.73	110	.468	0.01
	Any Problems	12.54	.433				
Harm	**No Problems**	8.00	.696	-1.9	110	.060	0.12
	Any Problems	9.51	.447				
Medication	**No Problems**	9.89	.568	-2.15	110	.034**	0.2
	Any Problems	11.36	.395				
Solicitude	**No Problems**	8.03	1.043	-4.35	110	<0.001**	0.39
	Any Problems	13.40	.709				
Medical Cure	**No Problems**	8.92	.542	-1.11	110	.268	0.11
	Any Problems	9.67	.394				

** = statistically significant at <0.05

Table 4.10 shows that Anxiety/Depression has a significant relationship with Emotion (p = <0.001); Medication (p = 0.034) and Solicitude (p = <0.001).

Table 4.11 Health Scale and SOPA-R Scores

Domain	Mean (Health scale)	Std Error Mean	t	df	p-value	r
Control	58.845	1.976	29.78	109	<0,001	0.94
Emotion	60.018	2.180	27.53	109	<0,001	0.93
Disability	56.955	1.988	28.64	109	<0,001	0.94
Harm	60.691	2.190	27.72	109	<0,001	0.93
Medication	58.827	2.103	27.97	109	<0,001	0.94
Solicitude	60.273	2.063	29.21	109	<0,001	0.94
Medical Cure	58.845	1.976	29.78	109	<0,001	0.94

Paired-samples T-test was used to assess the relationship between the reported health on an analogue scale and pain attitudes and beliefs as shown in Table 4.11 above. There is a positive relationship and strong correlation with a large effect size and it was statistically significant across all domains with p-value = <0.001 and r = 0.93 – 0.94.

4.6 RELATIONSHIP BETWEEN PAIN ATTITUDES AND BELIEFS AND ABSENTEEISM FROM WORK

To determine the relationship between pain attitudes and beliefs and absenteeism from work, Pearson's Correlation test was used. As shown in Table 4.12 below there is significant relationship between Emotion (p = 0.006), Medication (p = 0.005) and Solicitude (p = 0.002) and absenteeism from work.

Table 4.12 Absenteeism from work and SOPA-R scores (n=110)

Domain	Correlation Coefficient (r_s)	p-value
Control	-.152	.114
Emotion	.260	.006**
Disability	-.007	.946
Harm	-.014	.881
Medication	.263	.005**
Solicitude	.287	.002**
Medical Cure	-.079	.409

** = statistically significant p = <0.05

To determine the effect of whether the injury occurred while on duty has on pain attitudes and beliefs, Independent T-tests were used, as shown in Table 4.13 Interestingly only three (3) out of the seven domains were found to be statistically significant. The highest to lowest significance are as follows: Disability (p = <0.001, r = 0.32), Solicitude (p = <0.001, r = 0.38), Medication (p = 0.016, r = 0.23). These are all positive relationships with disability and solicitude showing the strongest correlation with a medium effect size. These are all maladaptive beliefs which means that persons who were injured on duty (IOD) may be predisposed to more time off work. See Table 4.13 below.

Table 4.13 Relationship between the cause of injury and SOPA-R scores

Domain	IOD	Mean	Std Error Mean	t	df	p-value	r
Control	**Yes**	11.36	.488	2.12	110	0.37	0.2
	No	9.56	.582				
Emotion	**Yes**	10.32	.520	2.26	110	0.26	0.21
	No	8.06	.907				
Disability	**Yes**	13.49	.406	3.57	110	<.001**	0.32
	No	10.88	.573				
Harm	**Yes**	8.92	.481	-.28	110	.784	0.03
	No	9.16	.609				
Medication	**Yes**	11.36	.371	2.44	110	.016**	0.23
	No	9.63	.642				
Solicitude	**Yes**	13.17	.708	4.3	110	<.001**	0.38
	No	7.59	1.053				
Medical	**Yes**	9.63	.373	1.08	110	.285	0.1
Cure	**No**	8.88	.610				

** = statistically significant p = <0.05

4.7 SUMMARY OF THE CHAPTER

The following fundamental results were obtained from the analysis of quantitative data of the participants:

- The number work days lost by a 110 participants amounted to over two years.
- Problems were experienced in all health domains (Mobility, Self-care, Usual Activities, Pain/Discomfort and Anxiety/Depression) in workers with MSDs with only a minority of problems being experienced in Self-care.
- Pain is a significant factor in overall health as the participants had mean score of 69.68 on the health scale.
- The domain of emotion was found to have a significant association in all domains of health except Pain/Discomfort. Control was the only other domain found to be statistically significant in Self-care. Both Harm and Solicitude had a significant association with Mobility. The strongest correlation with a significant association between the SOPA-R domains and Anxiety/Depression is Solicitude.
- All domains of pain attitudes and beliefs was significantly correlated to overall health status.
- The pain attitudes and beliefs of Emotion, Medication and Solicitude was significantly associated with absenteeism from work due to MSDs. A significant and positive relationship was discovered for the same domains if the cause of the MSD is from a work-related injury.

The next chapter will outline the management experience of workers with MSDs focusing specifically on the impact, treatment and outcomes with HCPs.

CHAPTER FIVE

QUALITATIVE RESULTS

5.1 INTRODUCTION

This chapter contains the results of the thematic analysis of the one-to-one interviews which attempts to answer the objective of the study, namely, to explore workers' experiences of the management of pain attributable to musculoskeletal disorders (MSDs) in Mbombela, South Africa. Purposive sampling was employed where six participants were involved in one-to-one interviews. These participants had indicated that they were willing to participate in an interview after completing the questionnaire in the quantitative phase of the study.

5.2 ONE-TO-ONE INTERVIEWS WITH WORKERS (n = 6)

A total of six (6) one-to-one interviews were conducted with workers from the Mbombela Municipality of South Africa. There was no need for further interviews as saturation was reached. The demographics of the participants are outlined in Table 5.1 The interviews occurred at a time and place convenient to the participant and all COVID-19 precautions were observed. Each participant was encouraged to provide all details relevant to each question. The Thematic Map displaying the development of emerging themes and sub themes are presented in Figure 5.1. A list of emerging themes and sub-themes are presented in Table 5.2.

Table 5.1 Demographics of candidates selected for the interview

ID Code	Gender	Occupation	Area of Concern
A1	Female	Veterinary Nurse	Ankle
E2	Female	IT Administrator	Head/neck
E72	Female	Admin Clerk (Food processing)	Lower back
E18	Male	Security Supervisor	Chest

E152	Female	Practice Administrator	Lower Back
E97	Female	Club/Provincial Hockey Player	Calf

Table 5.2 Emerging Themes and sub themes

THEMES	SUB THEMES
Highlighting the presence of pain attitudes and beliefs in MSDs	-
Psychosocial determinants of pain	- Yellow Flags - Pink Flags - Environmental and Social Factors
Healthcare Professional and the worker relationship	- Biomedicalised healthcare - HCP and worker knowledge of pain - Communication is key
Assessment and treatment of MSDs	-
The worker is always right?	- Worker experience with pain - Impact of pain on the worker - Ideas, concerns and expectations - Response to care - Autonomy and shared decision making - Recommendations

Verbatim quotes will be used to further exemplify the above-mentioned themes.

5.3 HIGHLIGHTING THE PRESENCE OF PAIN ATTITUDES AND BELIEFS IN MUSCULOSKELTAL DISORDERS

The researcher noted that pain attitudes and beliefs are evident amongst workers and are facilitating the responses and actions taken towards their pain experience. These are quite subtle and without understanding pain and that it is a biopsychosocial phenomenon it is often disregarded as an exaggerating individual. It is also clear that workers are not being questioned about their ideas or concerns regarding their symptoms during their consultations with HCPs that elucidates these attitudes and beliefs. It is integral to noting the attitudes and beliefs of workers as it will facilitate clinical decisions regarding the worker's future treatment. These beliefs are capable of both supporting and hindering recovery from MSDs. HCPs not acknowledging them may result in the worker receiving inappropriate care or undergoing unnecessary assessments.

Pain attitudes and beliefs are shaped over time, but HCPs behaviour appear to have immense influence, and this is happening inadvertently which can be counterproductive to the intended care. The adaptive beliefs demonstrated by the workers are Control and Emotions being cogniscent that these beliefs can facilitate recovery or amplify maladaptive beliefs. Maladaptive beliefs demonstrated by the workers are Disability, Harm, Medicating, Medical Cure and Solicitude. The two pain pathways that were also present are Fear-Avoidance and Persistence-Endurance which are held on the foundations of the existing pain attitudes and beliefs. Cognitive behavioural theory supports this observation that pain elicits change in the individuals thinking about pain in the form of maladaptive and adaptive appraisals and the former can lead to subsequent increases in pain (Taylor et al., 2016).

Control is demonstrated by the perceived ability of individuals to manage their symptoms and believe that it will improve. It can facilitate recovery or evidence of low control could indicate the patient is within the fear-avoidance pathway.

> *"In a strange way it actually feels so much better when I exercise."* **(E152)**
>
> *"to actually keep playing because I thought that I was no going to play anymore Mm and she told me I can and I will get better with time and motivation."* **(E97)**

This is showing that participant **E152** understands that exercise and movement can be used to manage pain and participant **E97** believes that the symptoms will improve with time. These are key control traits that could facilitate recovery and prevents ideas of damage or disability. Other workers expressed the opposite of this which prolonged sufferring and held them within the fear-avoidance pathway.

> *"It wasn't easy, it didn't feel good at all you don't know when it's going to start."* **(E2)**
>
> "*I used to run a lot, you know, and do walks and all that but if I do anything and worsen this pain I might cripple myself."* **(E72)**

Pain-related fear is a major explanatory variable for disability and has significant prognostic value regarding the development of persistent musculoskeletal pain (Meier et al., 2018). This loss of control, if unmanaged will develop into worse symptoms over time and further facilitate maladaptive beliefs.

Emotion is a powerful influencer over pain as it can increase or reduce pain. By definition it is always part of the pain experience. It is a strong indicator for recovery or chronicity from pain and many of the workers' choices hinge on it.

> *"Yes, more suffering and frustration than you would ever think, there is a mental and physical part of it, the mental pain was that I would get irritable, you get angry quicker and you don't enjoy anything."* **(A1)**
>
> *"It was very stressful, actually the stress the stressfulness part of it started at work."* **(E72)**
>
> *"shock and the stress that came from it that knowing that there's no other way I just have to go for the surgery and just has to be adjusted somehow."* **(E72)**

The emotional aspect of pain if left unchecked rapidly deprives the individual of their ability to make sense of their pain experience which spills over into other aspects of their life. Their quality of life and performance in activities of daily living takes a massive toll as described by participant **A1**. Emotion is an overlooked and underestimated factor in the pain experience and can also be caused by the emotive impact of our words which is evident in participant **E72**'s dialogue.

Emotion is not all dark as it can be the light that nurtures the individual to surmounting their pain experience.

> *"It made me feel alive again because I was on the verge of collapsing. It made me feel alive and actually love now to have my mum and sister, like besides me, to actually keep my head up high so it was actually good "* **(E97)**
>
> **"***Jah, I feel a lot better when I exercise I go running in the morning like 5k's and then I just feel a lot better about myself, and am not getting any younger so I need to maintain the weight…and the weight (giggled and laughed)* ***I: Are those things important to you.*** *Yes obviously."* **(E152)**

The emotional support experienced by participant **E97** provided ample motivation to pursue recovery and displays that pain is dynamic and we are influencing each other's experience. Emotion is not as superficial as happy or sad but boils down deeper to self-confidence and self-esteem as shown by participant **E152**. This worker's motivation seems odd but it supports improving one's health and managing the pain experience.

The maladaptive beliefs are pure hindrances to recovery. It can be pre-existing within the individual or developed over time based on what society believes. As discovered by Andersen et al. (2017) the site of a MSD has no significance on prognosis but completely by psychosocial determinants that are melded with the existing pain beliefs.

Disability beliefs are fixations that your current symptomatic experience and physical function are permanent (Caneiro et al., 2021). These can develop within days of an injury or only appear after weeks to months. They heavily impact an individual's trust in recovery and motivation to continue working despite their pain.

> *"can't afford not to work and the real thing was for me and was my greatest concern that my ankle will not recover 100% that it would be like I'm just gonna walk and I would step on something uneven and there we go again we start from the beginning."* **(A1)**

> *"The exercise- The going out was not fun anymore as you would be out with people and then this pain just flares up so sometimes I would just be lying down whilst out with people so imagine be out with people and lie down and it hasn't been easy as most of the things."* **(E72)**

Disability beliefs cause individuals to lose sight of the fact that pain and function are amenable to change. This belief is present in participant **A1** as she has the fervent idea that she will injure herself again and that it will repeat itself. The experience of pain is subjective to the individual, which is repeated for their experience of disability, which forces them to withdraw from various activities of daily living.

Harm beliefs are self-constructed facts that the body is damaged in some way or that damage will be done while engaging in a specific activity or something has not healed correctly. These are easily identified by language individuals use in describing their bodily areas and are often just conjecture rather than fact.

> *"No I just thought it's the airbag that caused damage to my chest."* **(E18)**

> *"I needed to apply for something else, something different because I just did not want to be in the Lab anymore and you stand a lot in the lab."* **(E72)**

Statements made that are similar to participant **E18** need to be quickly identified and challenged as they begin to change their entire lifestyle based on the idea. The central nervous system can become easily sensitised after an injury and thorough investigations must be done to confirm or refute the presence of tissue damage (Nijs et al., 2019). Participant **E72** attempted to make changes to her work to prevent further injury which was solely based on the experience of pain. Pain is indicative of a need for protection, not damage and the shift to that understanding must occur to prevent other negative implications.

Medical Cure is a product of the biomedical model, it is believing that there is something that must be fixed for the pain to resolve. It has the highest financial cost to the individual and the economy as efforts are made with expensive assessments and procedures in attempts to solve the problem.

> *"So basically I only had this doctor left and I decided well, come hell or high water I needed to sort this out as I cannot walk like this and I'm not going to sit with a foot that's going to bother me for the rest of my life."* **(A1)**

> *"I used to go for my sessions a lot which were helpful Mm Mm so she mentioned that, she once told me about, that maybe I should see Chiropractor to adjust my spine because she felt like there was, I don't know what you guys call it in your health terms. Hhh I was considering doing that, just the way the pain was too SEVERE."* **(E72)**

Participant **A1** and **E72** are owned by the idea that there is another scan, procedure or treatment that will fix the problem. This belief is endorsed by healthcare systems due to an overflow of medicine into musculoskeletal health (Lewis et al., 2020). If healthcare systems had evidence-based protocols in place for MSDs, similar situations are less likely to occur.

Medicating is believing that only tablets or drugs can treat pain and has become an overused expense to the economy and detriment to the health of the individual.

> *"Because it was not like I could drink a panado and it would stop the pain, it didn't work like that. I did try panado and it didn't work I even tried a muscle relaxer and that also didn't work."* **(A1)**
>
> *"but it hasn't been like a permanent thing or a long time thing, I would just take it when needed and I could not take trypiline all the time because it would just knock me out so that was not very good for me."* **(E2)**
>
> *"So that's the only thing that would give me relief unlike panado which I don't take, the codeine really helps."* **(E2)**
>
> *"I can't remember the name of that – but I think it had 5mg of the active ingredient Okay but then he upped the dosage to 10 because the pain was still there."* **(E72)**
>
> ***I: "After that were you managed to get into control again?*** *Jah. – With pain pills [(laughed, laughed)] yah luckily they prescribed me with pain killers afterwards."* **(E152)**

It is evident in workers that medicating is a primary means to treating pain. The real danger exists when an individual knows exactly what they want, such as with participant **E2**. It develops into a medication seeking crisis displayed by participant **A1** by vehemently searching for something that will work. HCPs are facilitators of this, as seen with participant **E72** where if the first dosage did not work, then a higher one is needed. It is well established that the long-term effects of medication exacerbate symptoms rather than reducing it, but this practice is still enforced (Eberhardt et al., 2021). The archaic label of 'pain killer' used by participant **E152** reinforces the idea that pain is harmful or bad when in fact it is a protector (Moseley & Butler, 2015). The healthcare system has the majority responsibility for the medicating practice of patients as alternatives were not advised by the HCPs.

Solicitude is synonymous with low self-efficacy, the idea that I am in pain therefore I need care from those within environment and I should do less. Society has a profound role in this as we learn to manage pain from each other and repeat the practice of the previous generation (Chen, 2011).

The loss of self leads to low self-efficacy as individuals can be measured by what they can do. Solicitude results in lower activity level and reduced work participation as displayed by the participants below (Knittle et al., 2011). The withdrawal from activity due to pain though there is no risk of further injury from those activities occurs only because social circumstances allow it. The drawback is this behaviour promotes lower self-worth and negative emotional states that impedes recovery from pain. This is confirmed by social learning theory that a behaviour can be labelled as solicitous only when it results in a systemic increase in the patient's pain behaviour (Newton-John, 2002).

> *"Overall I think at first I got someone to help me at my house so that I was not doing a lot of hard work just to give myself rest and manage the pain and honestly"* **(E72)**

> *"Umm It was a bit of both Ah okay, I didn't enjoy anything anymore and then the fact is that I could not even help my Mom physically with anything because I could not stand on my foot, not even the dishes, the washing or anything it would hurt so much."***(A1)**

Pain attitudes and beliefs are influencing the choices regarding participation in ADLs and work made by workers with MSDs. The dilemma is that it more often evident through spoken word and must be appropriately addressed. The healthcare system has a fundamental role in addressing maladaptive pain attitudes and beliefs it but appears to be creating its own dilemma.

5.4 PSYCHOSOCIAL DETERMINANTS OF PAIN

The psychosocial factors are non-physical internal and external factors affecting an individual's perception, responses, and choices regarding their pain (Sheikhzadeh et al., 2021). This can include stress, anxiety/depressive disorders, various interactions with people, financial difficulties or simply their understanding of their pain experience. These factors are closely linked to pain attitudes and beliefs as they constantly overlap one another. The environment the patient is in may also have an effect which differ between individuals based on their understanding of pain.

This level precision of pain based on the weather conditions described by participant E2 can be associated with central sensitisation. The participant clearly believes the sole cause of aggravated experience is the colder temperature. A complexity develops as the brain now perceives winter as harmful and creates a 'neurotag' associated with it that facilitates the experience (Wallwork et al.,2015).

> *"Winter time I SUFFER with my back and I can tell you where exactly in my spine"* **(E2)**

The social dimension of a shared experience must not be underestimated as we constantly influence each other's perception and beliefs of pain.

> *"when we approach the scene of the accident we start to get scared."* **(E18)**

A past experience can easily be reincarnated to a physical symptom due to the fear as a collective 'we' described by participant **E18** could cause the individuals to influence each other's choices and responses to their pain. These can occur as facilitators and inhibitors of recovery in the form of pink and yellow flags. Yellow flags are the barriers to recovery and are often more indicative of a long-term prognosis than objective findings alone (Emilson et al., 2021). Yellow flags present added difficulty to achieving successful outcomes within any healthcare profession and are embedded in the BPS model of health. Sorondo et al. (2021)

affirm that treatment of MSDs must involve assessment and management of yellow flags to ensure successful long-term outcomes. Yellow flags include the psychosocial dimensions Attitudes, Behaviour, Compensation, Diagnosis, Emotions, Family and Work. These dimensions can appear in any combination to any degree within an individual experiencing pain and persistent pain. Pink flags have the same dimensions but the opposite effect as it facilitates recovery and supports goal attainment.

i) Yellow Flags

The yellow flags are psychosocial indicators of potential chronicity of the problem being experienced by the individual. It provides a lens into understanding the individual's beliefs about their problem and provide alternative targets for treatment. These elements are subtle and cannot fully be uncovered by objective testing and would appear through the individual's which are the product of their ideas and beliefs

In the experience of participant **A1** yellow flags relating to attitude, behaviour, work, emotions and family. The participant makes the allusion that her pain experience indicates that her ankle is weak and she is unable to perform her work properly. That belief does not correspond with the modern understanding of pain as a protector not an indicator of the current condition of the body. In her following statements there is definite conflict with the employer which can result in added stress for the participant with perceived unfair treatment. Her last statement provides a clear picture of family concern which is a strong influencer in pain. Social influence from family can rapidly change the beliefs and understanding of a pain experience (Martel & Sullivan, 2018).

> *"When I do run after animals and pick up heavy stuff as I cannot do my job properly if my ankle is weak."* **(A1)**

> *"I would inform the guys that are in charge of the IOD's and I struggled with him a few times I asked him for help and he said it is not his problem."* **(A1)**

> *"Well my Mother is a big stressor, Ah she stressed a lot, and Umm my brother's and sisters were also concerned and would phone me daily to know what's going on with my foot."* **(A1)**

Participant **E2's** statements show higher presence of flags relating to emotion and behaviour. There is clear difficulty with emotional regulation and staunch medicating behaviour that is also self-destructive. The medicating behaviour continues regardless of the already existing ulcers that is described.

> *".hhh, just any type of stress any type of anxiety Ah you know Umm (laughed) I think also a lot of anxiety contributes to everything, maybe I don't know I'm getting anxious."* **(E2)**

> *"I didn't know what works and what does not so I had to find the correct pain medication that was also stressful cos so I also have like ulcers you know."* **(E2)**

Participant **E72** displays dominant work, behaviour and attitude related yellow flags with lesser flags of emotion and diagnosis. There is loss of enjoyment for the work which can be related to the pain itself but also shows that there is a loss of purpose. The second statement is clear fear-avoidance behaviour which carries into her last statement The avoidance behaviour led to belief that the current condition is now fixed until a 'well' stage is reached. The participant experienced a sense of loss mainly due to their choices, a result of her misunderstanding of her pain. The term 'well' is arbitrary as it has different meanings for everybody but in this situation being linked to a pain experience.

> ***I: "So how did you feel about your job at that time? Was it something you really enjoyed, was it difficult, what were overall comments about your work?*** *It, it wasn't difficult it was pretty easy compare to what I was doing in the Lab, Ah because it was*

> *during the time when you know there was, what can I say, <retrenchments> is it) .hhh and, were taking place in my company."* **(E72)**
>
> *"Is wasn't very enjoyable but it was fine, it wasn't a hard job."* **(E72)**
>
> *"after I got injury I avoided exercising altogether."* **(E72)**
>
> *"I am now like not trying forcing myself to do what I can't because you know so I think Umm Umm jus- <I just accepted that I'm not that old person that I was and there are things that I just need to just make a reduce doing for now until I am well."* **(E72)**

In participant **E152** diagnosis is the dominant flag as the belief exists that the current experience is fixed and change is not possible. There is opportunity for the belief to change since the participant has indicated that she is not disturbed by differing opinions of HCPs.

> *"I still don't know what the cause of the problem I don't know if I was born like it, there was different opinions. I never had problems before that horse riding incident. Maybe I just didn't know (laughed) and made it worse." [**I: "and this opinions never bothered you one doctor says one thing and thee other doctor says another thing.** No, not really I just thought it is what it is you know."* **(E152)**

Yellow flags are strong determinants of pain that are subjective but provide insight into the individual's beliefs and their experience with pain.

ii) Pink Flags

Pink flags are the opposite of yellow flags as they facilitate recovery from disease and injury. They share the same labels as yellow flags but often completely missed as HCPs who are aware of psychosocial indicators only assess for the one's that lead to chronicity. Pink flags need to be affirmed as they can be a deciding factor on the participant's overall response to their pain.

In participant **A1's** remarks show a strong presence of work and family related pink flags that can be advantageous for successful recovery. This view demonstrates willingness to work despite pain and can also be considered as work being part of the rehabilitation. If taken too far may result in the participant following a Persistence-Endurance Pathway which may result in worsening of symptoms. This is remarkable to see that workers can find positive experiences within their work during their recovery.

> *"I was brought up with certain work ethic, and Umm (stutters) it was not comfortable but your work has to get done"* **(A1)**

> ***I: "Is that where it comes from that resilience, mind over matter?*** *Jah, Not really, my resilience is more about my work ethics. (Uttering sound was finding it difficult to say the word) My Parents brought up you know, it's a thing from when you got work to do, even if you've got a toothache to work you must go no one else will do it for you. This was grained into me since I was a child."* **(A1)**

Participant **E18** and **E72** take a different approach as they seem to doubt the possibility of recovery but through engagement with their HCPs their beliefs were overturned completely. Their attitude, behaviour and understanding of their diagnosis could have prolonged their symptoms and disability experience. Psychosocial indicators are not static and how workers experience their pain is shaped by those they interact with.

> *"Yes I started to do lot more things. Even though the first time it was hard Mm Mm. Since my physio sessions things became easier."* **(E18)**

> *"She didn't necessarily tell me how long it will take for me to be well but felt that if I continue with the exercises she gave me then it will be fine or it will be better than what it is now. Which by the way it's much better than when it started Umm so I don't know how long it will take. Jah but I am positive that I will be fine."* **(E72)**

The remarks of participant **E197** and participant **E152** show positive impact of family and emotions with their own motivation to continue despite their pain. Participant **E152** does not seem to know where that behaviour comes from it can be a result of social influences within her home and work environment.

> *"also my immediate family cos like it is okay, motivating me to play , in a good way okay as they were also worried but then I told them not to worry its okay, [in a way I lied I should not family (laughing) I lied as cos I knew mum would say you to go now! like "TODAY" to see a Physio. That would have caused me not to PLAY ANYMORE so I was like I will tell them after the game."* **(E197)**

> ***I: "And, This pain experience you having did it affect your work attendance at all?*** *Hmm Mm, No not at all okay. [I: Never did you feel so bad that you have to stay and rest (laughed) at home because of-? No, no.] that's not an option [Never even have that thoughts of doing that, no] that's not an option."* ***I: "How did you manage to do that?*** *(...) don't know I enjoy it."* **(E152)**

> *"– get up and go on, so- it's not an option to stay home and be depressed about it okay but it's not that bad, (laughed) [to press the button, you know what I mean okay.] There's a lot worse things that can happen to you, it's not that bad I learnt to live with it, [a lot of people find lower back pain it's the end of the world, it depends on your personality] so."* **(E152)**

The presence of pink and yellow flags are dynamic and will never be the same between individuals as their experience differs. The dynamism of the worker's experience with pain comes from how their past was shaped and their day-to-day experiences within their environment.

iii) Environmental and Social Factors

The environment and society has its own way of changing that can facilitate or place undue barriers to recovery. The changes to the environment are largely outside the control of any individual and is often a matter of circumstance.

Pain from MSDs is no different from any other condition and the experience is influenced by the environment. In participant **E2's** case, colder temperatures may be aggravating existing central sensitisation change and the participant's behaviour towards their symptoms. She is making a direct link of the pain to the colder temperatures without recognising the complexity of the systems responsible for the aggravation of symptoms. This allows for seasonal changes of the participant's experience of pain.

> *"Winter time I SUFFER with my back and I can tell you where exactly in my spine."* **(E2)**

"Worker's can be placed in the situation where they would have to return to the scene of their injury and re-live the associated trauma. Emotions are embedded into their pain experiences and continuous exposure to it can result in behaviour changes. The 'we' adds a social dimension to the worker's experience that makes it more profound."

> *"When we approach the scene of the accident we start to get scared."* **(E18)**

Social factors and circumstances can be incurred by workers because of someone else's choices but still has great effect of the worker's choices in response to their pain experience.

The ability to obtain care can be arduous and an unnecessary impediment to recovery. Worker **A1's** remarks indicate that funding impacted her ability to receive care. In addition to this there was also resistance from the employer for assistance. Her second indicated limitless care yet still found it difficult. This experience can result in additional time away from work due to the attitudes and decision making of the employer and HCPs picking and choosing who they help.

> *"Doctor number two I did it out of my own pocket, because I realised that there is no way the Government will pay me to go somewhere."* **(A1)**

> *"If you can think about a "Medical Aid Patient", that patient is going to have limits, which I do not. They have limits to the amount of x-rays, amount of MRI's and the amount of blood tests you allowed to do, all of those things."* **(A1)**

> *"I would inform the guys that are in charge of the IOD's and I struggled with him a few times I asked him for help and he said it is not his problem."* **(A1)**

Participant **E18** and **E72** continue with the same theme, forced into difficult decisions due to decisions made by the employer and HCPs. This occurs due to the lack of a consensus on what regulations should be followed and how care should be provided. The lack of employer assistance can drive adverse attitudes and behaviours within the worker that would prolong their recovery. A review by Beales et al. (2016) support the need for employers, healthcare professionals and other stakeholders to be active in the employee's recovery and RTW process to reduce time away from work and burden of care to the employee, more so in the instance of a work-related injury.

> *"Only thing is I reported at work and they never even ask how I am feeling. They only told me that I must come to work today, I had to go to work because no work, no pay."* **(E18)**

> *"I also <felt it was, it was unfair when they told me I should use my own medical aid and do my own cash, I felt it was unfair, <it was>, <it was>. I just didn't FEEL OKAY about this."* **(E72)**

Social factors are not only to the detriment of the worker but can be supportive as well. The experience participant **E152** demonstrates that it can speed up recovery but it is a matter of circumstance.

> *"I don't think it really affected them that much because I just go on okay, so they never actually communicated and given some input what think about it what you should do, well my husband made appointments for me to go to the doctors to go Physio's, well his into Rugby and he knows a lot of people so it was actually one of their Physios at the SA sevens academy In Stellenbosch so he supported me right to the end."* **(E152)**

Psychosocial determinants of pain are impossible to predict and present both consequences and opportunities for workers with MSDs. It is evident that workers' interactions with family, HCP and other stakeholders are at the centre of the spectrum and how they will affect their experience.

5.5 HEALTHCARE PROFESSIONAL AND THE WORKER RELATIONSHIP

Workers with MSDs will consult with an HCP and that amongst all during the recovery is the most essential. This dynamics of the relationship is primarily based on the HCP's approach to care and their understanding of pain and MSDs.

i) Biomedicalised healthcare

It is more than fifty years since the development of the biopsychosocial model but the biomedical approach remains dominant.

The HCP in participant **A1's** experience made a confirmation of recovery of soft tissue structures based on an x-ray. X-rays are used mainly to assess alignment and condition of bone, confirm the position of invasive medical equipment or assess the lungs which makes diagnostic accuracy in this situation questionable. The HCP is also linking pain to healing while it is already well established is about protection, not healing.

> *"He said okay I need to send you for X-Rays; he read the X-Ray and said to me there is no problem all ligaments are healing and you fine."* **(A1)**

> *"When I go to the third doctor here, I did give him the referral letter but I don't even know if he read it. Because he just said to me jump on the bed, let me have a look at your foot and immediately he said to me listen the only way you going to fix this is by operating."* **(A1)**

Participant **E72** had a similar experience to **A1**, as the HCP was developed a diagnosis for pain purely based on a scan. This allows the worker to believe that the cause of their pain is solely based on an 'abnormality' while modern pain science dictates that sociological and psychological factors also influence the pain experience. The experience of participant **E72** exposes the flaws of the biomedical approach in treating MSDs and its 'medicalisation' has become problematic for health consumers.

> *"but one thing was Mmm with the Orthopaedic Surgeon that I saw at first he on the report pointed out on my 1st appointment that < I, I> have mild, Ah, What do you call this: scoliosis, is it scoliosis?"* **(E72)**

> *"I think the Orthopaedic Surgeon that recommended (hiccupped) Sorry that recommended the surgery, was the one that told me the pain was from the pinched nerve."*

> ***1: "And did the Physio that you recently saw now did they give you a diagnosis of what is causing the problem why you were having pain? Was there any explanation in that regard?*** *< She says is the muscle pinching> or something like that jah."* **(E72)**

Biomedicalisation of healthcare is most prominent in the experience of participant **E152**. A twenty-year long pain experience but still believes her pain is related to her nerve. The HCPs she consulted also gave her the impression that it will affect other physiological functions like childbirth. The dilemma here what evidence was presented to support that statement, what is the worker's problem other than a persistent pain experience. The biomedical approach has not been affective in diagnosing and treating pain attributable to MSDs and the health consumers are being punished for it.

> *"It was actually a nerve or something like but that I'm not sure what the problem was."* **(E152)**

> ***I: "So how do you- With this pain over the 20-year period how has your daily activities changed over time home, work, things you do for fun did it have an effect on it, did you have to stop doing things?*** *Not really hey! It was really bad at one stage but that was when I was pregnant when I had my son so actually I didn't have to do anything because I was at home with him. Umm the thing is what they also said is with the problem that I have I won't be able to get normal birth."* **(E152)**

ii) HCP and worker knowledge of pain

The worker and the HCP are both knowledgeable, HCP on the pathology and the worker on their experience. There should be shared understanding of each other's expertise but even unintentionally providing misinformation can have adverse effects for the relationship. It is responsibility of the HCP to ensure that all the information received is complete and accurate and to provide accurate information in response.

The statement of participant **A1** displays how the HCPs knowledge of the pathology, lack of understanding of pain and not respecting the experience of the worker degrades the relationship.

Firstly, the participant has a misconception on pain that bodily tissues have the highest association with pain.

> *"I also realised that the ligaments were also part of my pain and I know if you read about ligaments, it's says ligaments does not have pain. But I do believe there is some pain connected to ligaments."* **(A1)**

The participant clearly had concerns and disagreed with HCP's findings but the symptomatic experience is not enough to make a confirmation on its stability. This is displaying inadequate knowledge of pain from both sides of the relationship but also the lack of validation of concerns is impeding clear communication between them.

> *"No, deep down I did not agree as I could feel on my foot there wasn't no stability."* **(A1)**

The contrast in approaches between the physiotherapist and the doctor demonstrates different understanding of pain. The physiotherapist validates the participants concerns and probably made a conjecture that further evaluation is needed while the doctor just continued with medicating the problem.

Further on she provides insight into the problem that HCP's who are 'higher ranked' are creating for the healthcare system

> *"Then I kept on coming to my Physio and he could see and feel that my foot is still not in a good condition and that there is something is not, I don't think something is lekker there still seriously wrong with my foot."* **(A1)**

> *"Doctor continued giving me pain tablets and anti-inflammatory, every time he seen me or spoke tom it was just about pain medication and this was not getting any better."* **(A1)**

> *"Doctors are put on pedestals like the second guy and I was told that he is the best in the country. This expectation of people like you are going to help them like you are a priority for them."* **(A1)**

HCPs are allowing their knowledge to undermine and disrespect what their patients have. There may not be equal knowledge of the pathology but even the participant in this scenario understood what she was experiencing more than anyone. HCPs may have knowledge gaps that they are unaware of that lead to malfunctioning relationships with their patients. A systematic review by Emerson et al. (2021) emphasise that HCPs with authority on clinical-decision making are prey to their own implicit biases that facilitate inappropriate care of persistent musculoskeletal pain.

The protracted experiences of pain from MSDs arises from the understanding and expectations of the HCP and the worker. There needs to be an accurate understanding of what certain words mean, these should be ground rules of the relationship.

> *"He then said to me that my ankle has been over treated and I need to throw away the crutches, throw away the moon boot, and the brace and just walk normally because there is nothing wrong with my foot."* **(A1)**
>
> *"Yes, I have told him numerous times I told him there's something wrong it hurts a lot my toes it hurts up here on top of the joint and Umm I also told him my both my malleoli are still very sore and am not feeling better and he said to me "No" the stability is looking good. He took my foot hold it in his hand, he turned a bit, and said to me "No" it is stable."* **(A1)**

Participant **E72's** understanding of 'well' is paradoxical as the first rule of pain is that there is no such thing as pain free. Her full response highlights a trust issue that may have developed in her consultations with HCPs. A clear diagnosis and prognosis needs to be given at the start of care so the patient has a realistic idea of their recovery. Carroll et al (2016) affirms this as expectations of recovery is a dynamic cognitive process and goal setting should be negotiated so that there clear understanding what recovery from MSDs is.

> ***1: "What do you mean by well?*** *<(...) Pain free if I ever will be>."* **(E72)**

iii) Communication is key

Communication is the heart the relationship between HCPs and their patients. It is a clinical skill and treatment modality simultaneously as it helps understand the complaints and beliefs of the patient and shift them if necessary.

The experience of communication differs between relationships and can be the defining factor of recovery outcomes from MSDs. Workers will be exposed to this with their HCPs and employers if applicable.

Participant **E72** experienced a significant change in relationship by being allowed to tell her story. Her confidence and trust improved from being listened to but it is not always this simple. HCPs can be their own obstacles to communication or facilitate clear communication to recovery.

> ***1: "So what was the reasons behind that trust being better? What do you feel was different compared to the 1st one?*** *<I think our 1st session she allowed me to tell her exactly how I'm feeling, what went down and like what happened until I got where I was.> Right and then she, I didn't know how long she has been practicing but from our first session I felt like she was more experienced. Okay, yah and I think with her I got that she understands and she is more experienced."* ***(E72)***

The HCP participant **A1** consulted with took a direct approach by completely disagreeing and directing her. Attentiveness would have led to her concerns being validated and addressed but instead the HCP chose to ignore her experience completely.

> *"he comes back to me look me it is 100% there's nothing wrong with you, just stop and do what you supposed to do, leave the boot and crutches and everything, your foot is fine."* **(A1)**

Participant **E72** had a similar experience to **A1** but it extended to her employer as well and in her third statement resulting in a wall being erected by her. There was not only a lack of listening but also very limited options to what she can do to manage and treat her problem. HCPs underestimate the authoritative power they have and how easily they can inadvertently be making massive life decisions for their patients without exploring all options, risks and outcomes.

> *"I had to back to them with the Company Doctor and he said that >this was the same thing that was said but you guys never took it seriously."* **(E72)**

> *"It came as some kind of a shock (laughed/giggled); just knowing that I had to go to surgery which I thought that they will say there is another, okay this how we are going to solve it."* **(E72)**

> *"And then but I wasn't trusting anyone so even some of things that she said was fine I would just think this might just make things worse."* **(E72)**

As with participant **E72**, **E18** was also experiencing the full weight of the authoritative power being used HCPs. Being in this situation can become distressing for individuals, especially in cases where you may not understand what you are experiencing and this drives psychosocial risk factors that impede their ability to recover.

A study by Vangronsveld & Linton (2012) showed that validation of an individual's experience is treatment for the psychological drivers of pain as patients felt they have been seen and heard and invalidation reverses this effect. This is an act that society can perform easily but HCPs are more pressed to use it to achieve effective communication within the relationships with their patients.

> *"No there was no communication. They just said I must go to the other side."* **(E18)**

> *"It felt like I was not welcomed."* **(E18)**

> *"Even if I feel more pain I was going to tell them at Physio certain things the pain SEVERE. The Physio always told me what to do."* **(E18)**

The following accounts of participants **A1**, **E18** and **E97** demonstrate effect of a therapeutic alliance that addresses the concerns of the individual.

> *"ER doctor came in he said to me you don't look comfortable what else is wrong with you, can you tell me what you feeling."* **(A1)**

> *"He also asked me the whole story around the injury, which she did not do. He asked me the whole story around the story."* **(A1)**

> *" I said my score is 100. I was informed by my physiotherapist that recovery would take place within 8 weeks but with my positive mind-set I followed all my instructions from my physio and I was already feeling better in 8 days."* **(E18)**

> *"The physio helped me more than the other's, it helped me a lot, he made me understand more cos he did not just do the activities, like the needles, he explained to me why he was doing it and this made Mm me fully understand more."* **(E18)**

Communication is key and can abruptly halt the worsening experience of MSDs and shift pain attitudes and beliefs. Main et al. (2010) outline that HCP consultations must address the ideas, concerns and expectations, identify the objectives of the patient and provide consistent empathy and support. The doctors and physiotherapists that these participants had seen displayed this in its entirety. The HCPs shifted their attention onto the workers needs and not their own agenda of what they believe the worker is looking for.

5.6 ASSESSMENT AND TREATMENT OF MUSCULOSKELETAL DISORDERS

The general approach to musculoskeletal pain has always been met with controversy due to poor assessment choices and unnecessary treatments that did not resolve the patient's problem (Lin et al., 2017). In a biomedical world the assessment and treatment lies completely within the HCP and overlooks the concerns and expectations of the individual. If relief is not found within the treatment directed by the HCP the individual might consider exploring alternative options. Workers are no different in this regard and their experiences will be compared to a systematic review by Lin et al. (2018) on the best practice for musculoskeletal pain.

The two accounts of participant **A1** were at her first assessment and followed by follow-up assessment with a specialist. Her first assessment encounter already shows poor rapport which is due to the directive approach of the HCP in prescribing her treatment. A similar situation is evident in her second account. Lin et al. (2018) identifies the first step of best practice being person-centred care so that treatment is tailored to the individual and not done generically.

> *"She didn't' really have experience about what was wrong with my foot was and- she was sort of well you know you gonna go home in a boot Umm and make an appointment with the Orthopaedic Surgeon so that you can be evaluated."* **(A1)**

> *"He suggested I wear my "Moon Boot" for another 2 Weeks. Then somma now I'm gonna give you a script to see the Orthopaedic guys for a speed brace."* **(A1)**

Participant **E18** experienced a direct deferral in care from the HCPs he encountered. This sets a strong precedent for what he is perceived as and makes subsequent care arduous.

> *"They said we are not going to give you anything we are not even going to attend you that no doctor will see to me until they received the approval of the paperwork from my company Company. They said that I will not even get a meal." **(E18)***

> *"At Medic-Clinic on the 11th Feb they just give us put us on the drips and give us the pills okay Mm and then drink those pills but still there was those pains."*

Participant **E97** also experienced generic assessment and care for what she later learned was a calf strain. Lin et al (2018) discourages radiological imaging without evidence for suspected serious pathology and the assessment should also include neurological, mobility and strength testing. Her initial assessment's primary tool was an x-ray which affirms that there is a poor understanding of musculoskeletal care in a biomedical world.

> *"When she got back home Umm I took her to the doctor for x-rays, the x-ray didn't show much Mm and said its okay and then gave something to rub but it didn't get better."* **(E97)**

The workers had a variety of self-management approaches that were all based on the biomedical model. Participant **E2** plainly put it as her choice management was just pain medication which would be a practice incited by the HCPs she encountered.

> *"Just take pain medication like uhh sinus medication jah! nothing else just medication okay, that was basically it."* **(E2)**

Participant **E72** decided on learning unsupervised exercises based on a diagnosis that may not be accurate. Lin et al. (2018) advises that patients must be provided with education and information about their condition and management options. HCPs may not be taking care for the words or diagnoses used with their patients as in this case can send them off seeking treatment that is not tailored to them.

> *"on my side and stretching the stretches you know, from your head, let me just stretch my back up. I went onto "You Tube" and follow people that speak about Sciatic Nerve."* **(E72)**

> *"I started the massages and I was I told about the Sciatica Nerve so started researching about it, so even on You Tube I started following people that talk about it, the sciatic nerve and pain relief and stuff like that. So there were exercises some exercises that I*

> *would feel comfortable doing that were recommended in those videos but because they were not for me it was just a general information out there."* **(E72)**

Participant **E152** has twenty year history of pain and the most interesting part is how she elaborated her treatment by exclaiming 'PAIN MEDICATION' as if it were the only effective treatment. The question remains is if the physiotherapy and biokinetics involve active or passive treatment, was there a maintenance plan included. Her second statement details further on passive treatment that is only effective as an adjunct.

> *"I only seen physios and I saw a biokineticist and PAIN MEDICATION, jah, that's basically it."* **(E152)**

> *"but my husband will tell you that every night I make me a heat pack and I will put it on my lower back, okay.* ***I: So it was ongoing management?*** *Jah."* **(E152)**

The assessment, treatment and self-management workers were exposed to were not in-line with best practice. Assessments were not person-centred and maladaptive beliefs were emphasised which led to prolonged or non-recovery of symptoms. Generic treatments were advised that do not correlate with current evidence for musculoskeletal disorders. The current paradigm for the management of musculoskeletal health may be missing mark the completely at the expense of the health consumers looking to understand and manage their pain experience.

5.7 THE WORKER IS ALWAYS, RIGHT?

The person with the MSD is the expert on their associated pain experience but that expertise is not being used in their assessment and treatment. Optimal outcomes in musculoskeletal care are based on a trusting, therapeutic alliance that enables the patient to self-manage successfully based on the knowledge obtained during their consultations with a HCP (Calner et al., 2019). The sub-themes explore the worker's experience of their MSDs and treatment received and is knowledge their HCP may not have been privy to.

i) Worker experience with pain

HCPs may not be wholly aware of what their patients are experiencing unless the right questions are asked. Having this knowledge could be essential to treating their problems.

The worker's experience with pain starts from their first consultation and first impressions can make difference as indicated by participant **A1**. Poor experiences with HCPs can alter the health consumers self-perception and with pain the entire individual matters so HCPs have a responsibility to manage their implicit biases.

> ***I: "How did you feel about the treatment you received?*** *Well, Ah! The the female doctor" wasn't very sympathetic but Aah the male doctor that is head of the ER department, he - brilliant, it is not the first time I seen him. He helped me when the dog bitten I on my elbow a few years back."* **(A1)**

It is not simple feat to obtain appropriate musculoskeletal care and a diagnosis that explains the symptoms. A HCP provided participant **A1** with the same treatment but seeing no difference and treatment that is outside of best practice for musculoskeletal care. Workers like **A1** may be getting exposed to far more poor evidence-based treatment that prolongs suffering.

> *"So I was speaking to my physio and he said I should go for a second opinion because it was an injury on duty and I am only allowed to use people that's on the Central Data Base for suppliers. I struggled to find another Orthopaedic surgeon. Then eventually in March 2021 my doctor continued giving me pain tablets and anti-inflammatory, every time he seen me or spoke tom it was just about pain medication and this was not getting any better. Nothing seem to have improved I then said to my physio I think I'm going for a second opinion."* **(A1)**

The more one searches for answers the harder it can becomes. The HCP was expected to provide answers but did not take the time to listen the her story before making a decision.

> ***I:*** *"[****Did the second doctor touched or felt your foot*** *– "No not even" he did not even look or listen to me.] I was busy taking off my boot and he said my foot has been over treated and he turned around and left the rooms. Physically he did ABSOLUTELY NOTHING. And then My sister said maybe you should just throw away the crutches let's see-."* **(A1)**

There may pre-existing internal struggles that may have developed before the onset of symptoms such as with participant **E2**. She is even uncertain on the cause of the anxiety because it may be that which is facilitating her pain experience. An individuals' past, present and future are all relevant to the person which will have an implication for the pain. The pain itself does not have a chronological state and persistent pain is the body's inability to return to normal.

> " *.hhh, Just any type of stress any type of anxiety Ah you know Umm (laughed) I think also a lot of anxiety contributes to everything, maybe I don't know I'm getting anxious Ah but my body feels it jah.* ***I: Have you suffered with anxiety for a long time or is it also a new thing?*** *Not really hey it's also quite a new thing I haven't had like… Mm or maybe in my pain just didn't know (laughed) jah what it feels like I'd be anxious."* **(E2)**

Obtaining medical care is not straightforward as expected and in the case of participant **E18** receiving full attention from HCPs was delayed until it was approved. The absence of serious pathology must have motivated the HCPs to this action rather than swiftly managing his pain. The participant must have been distraught at the time and being forced to continue experiencing uncontrolled pain without receiving possible explanation as to its cause.

> *"No the way I was expected Mm jah it wasn't, by the time we arrived my chest was too much I wasn't even looking down the pain was too much (Inaudible text segment) they waiting for the company to approve we don't know what they have to approve to be*

> *approve. I was in SEVERE pain whilst awaiting for medical treatment the way I was feeling I was feeling like I was going to die Mm at the same time."* **(E18)**

> ***I: "Did they tell you what was wrong, why you were in so much pain did they ever explain?*** *E18: No nothing. The just gave me those pills. They asked me what is wrong and I told them it's the chest. They didn't tell me what's wrong with the chest nothing, nothing about my chest okay."* **(E18)**

The worker's experience with pain from the start was far less than ideal but still managed to return to his duties before it had completely settled. The reason for this action was the confidence he had received from his physiotherapist. If this kind of care was provided from the beginning purely by communication alone his experience of suffering would have been greatly diminished.

> ***I: "You had some time off but even when you went back to work you had some pains?*** *Yes, Yes I tried to do my best****.*** *On the 12, 13, 15 the I started to drive okay and the physio* ***I: Okay****. Then from there every time I went back the pain went down a little bit****. I: How did you manage to do that even though you were in pain, what made you do that?*** *[The strength, I: strength jah] okay.* ***I: And where did the strength come from?*** *The strength jah the strength that I got by the Physio. Mm I think from the physio as the physio told me I have to exercise often so that the blood can flow. I told myself if I do some of the exercises it would help me to move."* **(E18)**

Participant **E72** had to face the sea of endless HCPs, the same pain experience with multiple causes. The focus of the varying diagnoses was solely on structure of the body. This is ignoring the possibility of other mechanisms being responsible for the experience but only a biomedical view was considered in her case. This behaviour is expediating persistent pain as it results in individuals developing maladaptive beliefs and emotional distress.

> *"The thing is that I have been to a whole lot of doctors, <my, my case got very complicated> because of the accident and from then on I just went to different doctors, I think I saw about 5 if not 6 people about the same thing and they all said different things, but one thing was Mmm with the Orthopaedic Surgeon that I saw at first he on the report pointed out on my first appointment that < I, I> have mild. Ah, What do you call this: scoliosis, is it scoliosis?"* **(E72)**

Her situation did not end there as she was met with the same insensitivity from her employer. Her sluggish recovery that led to all her consultations was being fuelled by a belief that medication will cure her pain. She became a victim of the number one crime of pain, not being validated.

> ***I: "What did it feel like getting all the different information from Mmm different doctors?*** *It was very stressful, actually the stress the stressfulness part of it started at work. I was emotionally stressed because at first when I told them that the back pain was .hhh coming up again after the second physio I felt that I was fine because I was also still on medication. So when the medication was done the pain started gradually came back. So I reported back at work and they didn't believe me I had to use my own medical aid and pay for all my consultations and all that. So it took time and a whole lot of emotional strain on my side and I think that was the hard part about it. And yah I think It longer than It should have and that took a toll on me emotionally especially was not nice to go through pain, you know?"* **(E72)**

Workers have an arduous time moving through the 'recovery' process from MSDs which is primarily being orchestrated by HCPs. There is definitive absence of a patient-centred approach within musculoskeletal care which is driving maladaptive beliefs within workers.

ii) Impact of pain on the worker

Understanding the impact of pain on the worker is crucial to understanding their unique experience. It is possible to encounter the same MSDs in many persons, but each has their own unique experience. A systematic review by Langberg et al. (2019) to define person-centredness identified understanding the experience of the person as one of the primary dimensions.

Participant **A1** experienced a progressive loss in ability to perform her activities of daily living. If HCPs understood this side of her experience, there may have more haste in trying to resolve it. Her loss went as far as social engagement along with clear central sensitisation of her pain has it spread to other bodily areas not initially present or ordinarily expected to be a part of her original injury.

> *"Yes it did, in the beginning when driving I would take off my moon boot and drive without my brace. Now I-, the pass in Barberton is not very nice to drive with a boot on, believe me. Even with the brace it was difficult to drive. As soon as I felt (stutters) the times I was booked off there was basically nothing for me to do because I could not do the washing of the dishes, I could not walk up and down the staircase, I manage to do the washing but I could not hang it up because I couldn't get there because it hurt. and I was getting tired very quickly."* **(A1)**

> *"I was getting tired very quickly Ah (…) I fell twice on a step going through our drying area. It was very frustrating I could not even go to the Mall. I also felt a lot of pain in other areas of my body – My back was sore, my knees, my shoulder's, my feet, my hip. The pain was just more and more and more. So there was nothing I was enjoying anymore."* **(A1)**

Participant **E72** was having side effects of her treatment and an example of how caution must be taken when making treatment choices.

> *"I was also feeling drowsy whilst I had to work shifts and do stuff like that."* **(E72)**

She also reduced her activity level to match her symptomatic experience. Her pain began to dictate what level activity she could have. There is a clear emotional impact due to her limitations because of her pain.

> *"So I-I avoided exercising and if it was very uncomfortable I would most of the time just walk, take light walks."* **(E72)**

> *"There were some where I just feel like, umm, if it causes more pain or if I feel uncomfortable about it. I also think it was an emotional issue I would feel tired Hmm when the pain does not get any better."* **(E72)**

The view of one's overall health is also defined by pain as she described her misery. There is significant loss of self from the pain associated with MSDs.

> ***I: "Yah. You said you were 55 out of 100.*** *(Sighed) Laughed. I think at that time, Mm I was still miserable like the pain was just getting moved jah. WHY SHOULD IT BE 80 if cannot do the things I love anymore."* **(E72)**

Participant **E97** echoed similar reasons as she was not complete while still being in pain.

> ***I: "On that questionnaire I believe you answered Umm on your overall health you scored yourself 85 out of 100 when you answered the questionnaire at that time. Why did you say 85 and not 100? Why was this so? What were you using to determine your overall health.*** *Because I was using the amount of pain I was in and also how it felt <I wasn't totally (...) better Mm> <because of the amount of pain I was having but then with time I was recovering. So that is why I gave it an 85 and not a full 100 because in a way there was still a little pain."* **(E97)**

The impact of pain on workers is illustrated by a loss of ability, identity and participation. Resolving loss within aspects should be included in their care to achieve holistic health.

iii) Ideas, Concerns and Expectations

Ideas, Concerns and Expectations (ICE) reveal to HCPs the understanding that individuals have with presenting problem and what they expect the HCP to do about it. De Haes & Bensing (2009) emphasised the importance of understanding what the patient thinks is the problem (Ideas), what it means for them (Concerns) and what they are looking for (Expectations) in medical communication as the foundation in formulating a treatment plan.

Participant **A1** gives a view of the bodily structures that are causing her pain based on what she has learned about.

> *"Ah where pain comes from it was nerve pain or muscle pain or stuff like that. And I know there was also a certain amount of muscle pain, Umm and the inflammation and ligament pain, I also realised that the ligaments were also part of my pain and I know if you read about ligaments, it's says ligaments does not have pain. But I do believe there is some pain connected to ligaments."* **(A1)**

Participant **E2** indicated that her previous procedures and the weather are causing her pain. This provides a plain biomedical explanation of symptoms which is incomplete.

> *"I think the epidurals and you know."* ***(E2)***

> *"…because I had a C-Section okay for both of them okay so that impacted (Inaudible text segment) the pain in the back."* ***(E2)***

> *"**I: And why do you think that is only in winter the pain increases?** E2: I don't know I think the cold gets into my bones (kind of laughter) jah okay."* ***(E2)***

Participant **E18** demonstrates a direct link of pain to damage.

"No I just thought it's the airbag that caused damage to my chest." **(E18)**

Participant **E2** was the closest to modern neuroscience by indicating that it is all in your head and that people are different.

"I think it's all here, it's all in your head, and I think everyone's different and depends on one's personality." **(E152)**

One of participant **A1's** concerns is that her HCP was not concerned about her. She also indicates that there certain signs one should use to determine whether further assessment is needed.

"I was very upset!, I was very upset!, Cos I felt either he wasn't listening to me or he didn't worry about my pain" **(A1)**

"So If for instance I just come in here, and I say listen my wrist is paining and it does not matter if I rub it with anything or if I drink pain medication. I cannot handle the pain. Then you must know that the person really has a problem. Then you should rather inform you and check by doing an X-ray, MRI or icing the area or whatever." **(A1)**

Participants **E18** and **E72** are expressing concern over their employer's lack of concern for them. They expected more support during their recovery. This information is relevant to HCPs because best practice for musculoskeletal care advises engaging with employers to facilitate RTW.

"The only thing I saw it is difficult, it means all that the employer was more concerned about was their own belongings, properties, their job." **(E18)**

"If you are injured it's your own problem and if you are dead they can employ other people." **(E18)**

> *"It was just frustrating and I think at that time I was I just wanted it to be over and I didn't want to explain a lot things- (laughed) I was just I don't know- but <I think> if they have taken me seriously and everything that I've said and everything my doctor have said it wouldn't of dragged for so long."* **(E72)**

iv) Response to care

The effectiveness of care provided by HCPs directly affect outcomes and RTW timelines. The participant's attitudes and beliefs about the care they receive can be congruent with that towards pain. The critical aspect of care in musculoskeletal health and MSDs is that it must correlate with best practice and be person-centred.

Participant **A1** was not agreeing with one of the treatment options she is received and seems as if medicating the problem was being used as a repeated treatment but yielding no results. HCPs may not have the fullest understanding on pharmacological action of medication in treating the pain of MSDs. The fact the participant identified signs of harm from it is reason enough to be more judicious with it.

I: "Was that something that you wanted to be doing with all this medication? *No, I did not because it's not healthy Umm for (murmurs) your stomach that (stutters) anti-inflammatory medicine thins your blood so I started to get so many bruises so easily and I realise it was due to these inflammatory medicine."* **(A1)**

Participant **E18** was advised a manual approach by his physiotherapist which yielded results as the symptoms began to ease. He was also encouraged to use movement as a treatment which is a more active approach and demonstrates the efficacy of a combination of treatments.

"Yes after the physio told me to do this and try to massage the chest and try to move and then I felt the pain getting easier to better." **(E18)**

Participant **E72** hints at the possibility that she was discharged from care but was still experiencing symptoms. She is also positive about her recovery while losing a HCP to monitor her. The HCP did advise her to continue with the exercises which is an active treatment in-line with best practice for MSDs. This demonstrates what good coaching can do during consultations by providing the patient with tools and confidence to self-manage.

> *"She didn't necessarily tell me how long it will take for me to be well but felt that if I continue with the exercises she gave me then it will be fine or it will be better than what it is now. Which by the way it's much better than when it started Umm so I don't know how long it will take. Jah but I am positive that I will be fine."* **(E72)**

The choice of treatment can alter the attitudes, beliefs and perceptions the worker has of their pain and HCPs have the responsibility to ensure that it follows best practice guidelines. If the treatment is failing as in the case of participant **A1** an alternative approach must be used to prevent further harm.

v) Autonomy and Shared decision-making

Autonomy and shared decision-making provide structure to the patient-centred approach of care. It is one of the pillars of healthcare ethics places healthcare consumers in the driver's seat from the assessment to their recovery or desired outcome. The HCP is responsible for guiding and advising based on best scientific evidence for individual's presenting problem. HCP can experience the right to direct and be authoritative in their approach which has a place but in MSDs keeping them well-informed of their diagnosis and options leads to improved outcomes.

Participant **A1's** autonomy was not being respected as she had to ask to be referred for a second opinion and still being met with animosity by the HCP. A referral to another HCP for further assessment or confirming findings should always be on the table and demonstrates respect to the participant's autonomy. Further along there was clearly information about her diagnosis being concealed which is both harmful and minimises the participant's ability to make her own choices regarding care.

> *"I had to actually ask the 1st doctor to give me a referral letter, he wasn't very friendly about it but he did give it to me the letter."* **(A1)**
>
> *"I was like who is this guy this is not the doctor who treated me in the 1st place (laughing). You can't bring the two stuff together, how can you tell me one moment I'm fine and then when you write the referral letter for another doctor it's completely different to what you telling me is wrong with me."* **(A1)**

Participant **E18** experienced more open channels of communication with his HCP. There needs to be freedom to express concerns as in this case with the participant having confidence to receive information that will address them.

> *"Even if I feel more pain I was going to tell them at Physio certain things the pain SEVERE. The Physio always told me what to do."* **(A1)**

Participant **E97** experienced a textbook example of autonomy and shared decision-making. If there is an explanation for treatment choices where the individual understands the purpose of it and becomes an informed treatment choice. As a result of this HCPs actions experienced greater satisfaction from care because she had knowledge of the care she was received.

> *"The physio helped me more than the other's, it helped me a lot, he made me understand more cos he did not just do the activities, like the needles, he explained to me why he was doing it and this made Mm me fully understand more."* **(E97)**

Preservation of the participant's autonomy throughout their care is a critical component to their recovery. It compels the worker to take responsibility for their own care and treatment which may seem like HCPs are giving away their authority but they are reducing burden of responsibility of the healthcare system. A study by Grant, O-Beirne-Elliman, Froud, Underwood & Seers (2019) examined the challenges of RTW with pain and identified that the level of personal agency maintained through autonomy was a deciding factor on the worker's to adapt and continue working despite their pain

iv) Recommendations

Healthcare is a learning processes and treating MSDs is no exception to that. The health consumers are the only ones who can identify where the healthcare system succeeded and where it failed. It also assists all human beings who may be experiencing a similar problem and best approach to treating it. This information will assist in preventing the same errors from being repeated and support improved outcomes and faster recoveries in future. The only way to obtain this data is to ask the question.

Participant **A1** advises listening to the story being given as not every injury is the same. She also alluded to the fact that not listening results in information being missed that would enable HCPs to be more accurate with their assessment and treatment. HCPs also need to be innovative and unique in their approach to everyone as their presenting complaint may not always be straightforward just from an initial glance.

> "*I, I think listening is a very important story, don't just zone out people just because you've seen this injury before.*" **(A1)**

> *"The thing is we learn in our books, this is what it should look like but humans aren't in boxes, it doesn't work like that. We all at different levels and we all experience everything differently, you understand."* **(A1)**

> *"Yah, absolutely but like I said the thing is to get the root of it is just to listen to the patient. Try stuff because I don't fit into a box, when you get to a doctor he ticks one, tick*

> *two Uh, there's only two ticks in this box it can't be that. Then O look here's four ticks so it must be that."* **(A1)**

Participants **E18** and **E72** suggested communication, support, and consideration during treatment. This is an indication to HCPs that workers are also people who are looking to recover.

> ***I: "Something we can advise healthcare professionals on how we should be working with patients who had experienced traumatic injuries and pain?*** *Jah, The only thing you need if got an accident is communication and how to support them."* **(E18)**

> *"Okay, I think Hmm (unintelligible segment) maybe approaching people with the same condition that I have, try to be more considerate and listen to them. I don't know why people can like, think like a person can just lie about pain right Mm <but just be considerate and listen."* **(E72)**

Participants **E97** and **E152** directed their advice to all may experience a similar problem to theirs. Hope is the antidote to fear and a key insight to understanding that pain can improve. Time should not be wasted in identifying and treating the cause of pain as the recovery becomes more complicated.

> *"At first you should not lose hope Mm as I know how that is like to lose hope at all. That is going to bring them down. They must always keep going. Keep going and not cos you cannot give up something you love."* **(E97)**

> *"just getting treated earlier and not waited for such a long time which I did and if I knew the problem earlier it would have been much better by now."* **(E152)**

The workers' experience of pain is complicated and is predominantly influenced by HCPs. The pain attitudes and beliefs are being inadvertently enforced by the HCPs intended to treat them.

These attitudes and beliefs are powering the choices made by workers regarding their care and work participation. The South African healthcare system is not implementing best practice for musculoskeletal care. There is a dominant biomedical view without a person-centred approach that is enabling suffering amongst the healthcare consumers. The workers were mostly exposed to scientifically invalid assessment and treatment methods that did not improve their understanding of their disorder or resolve their pain experience.

5.8 SUMMARY FOR THE CHAPTER

The results of the qualitative data revealed the evidence that supports pain attitudes and beliefs are influencing the choices made by workers. It also exposed the experience of workers receiving care for MSDs with the successes and failures associated with it. Ultimately it demonstrated that the HCPs creating an iatrogenic disorder with unsuitable treatment choices, poor relationships with patients and a biomedicalised view that is shaping the pain attitudes and beliefs of health consumers. The next chapter will present the discussion of both the quantitative and qualitative results of the study.

CHAPTER SIX

DISCUSSION

6.1 INTRODUCTION

This chapter provides a deliberation based on the results produced in this study concerning the research questions, aim and objectives, as indicated in the first chapter of this study. Triangulation of the quantitative and qualitative results will be addressed in this chapter to present a conclusive discussion. Finally, assimilating the results and empirical evidence revealed in the literature review section will be performed to complete the discussion. The discussion begins with understanding pain and MSDs in the developing context, followed by the pain attitudes and beliefs of workers and impact on absenteeism from work, impact of pain and MSDs on overall health and finally, the experience of workers' management of MSDs concluding with the need to bolster support for workers with MSDs.

As a country, South Africa has a diverse workforce and increased vulnerability to it being hampered by MSDs. This caveat has been niggling at the economic output for decades, and the absence of effective preventative measures has allowed it to grow exponentially (Schierhout & Bridger, 1995). In 1997 the Centres for Disease Control and Prevention's National Institute for Occupational Safety and Health recognised the negative impact of MSDs and its associated pain on health and well-being (CDC, 2020). Since the Global estimates of the need for rehabilitation (Cieza et al., 2020) the World Health Organisation has recognised Musculoskeletal Health as significant concern at all levels of society (WHO, 2022).

6.2 MUSCULOSKELETAL HEALTHCARE

The biomedical approach is the dominant approach in musculoskeletal health and treatment of pain attributed to MSDs. This approach is evident amongst the healthcare professionals attending to some of the participants. It perpetuates the idea that the body is damaged and has often led to many assessments and treatments that do not resolve the individual's concerns. An approach that emphasises therapeutic alliance, education and healthy lifestyle choices aligns with the BPS model of health, delivers a new paradigm and shifts the individual's beliefs about themselves and pain (Lewis & O'Sullivan, 2018). One cause for the dominance of the biomedical model is insufficient knowledge of MSDs amongst first-line practitioners that pursue a pathology-finding mission resulting in delayed care (Barnes et al., 2021). The prevalence and risk of MSDs amongst workers in South Africa is well established for over a decade and have led to extended time off from work with minimal efforts to address it (Naidoo et al. 2009).

Ernstzen et al. (2016) examined the perspectives of healthcare of MSK pain in three patients from South Africa. The patients identified their aims as searching for an understanding of their pain and receiving support and collaboration from their healthcare professionals. The aims of patients have not changed, and they are still not receiving what they are looking for but instead having their experience medicalised and invalidated. A review by Sam et al. (2020) exploring shared decision-making in musculoskeletal pain in LMICs identified improved outcomes where shared decision-making occurred and failed mainly from preconceived ideas that patients and healthcare professionals had of each other underpinned by the biomedical approach. A centuries-old healthcare model produces more failure than success, but it is still the preferred choice. Other non-communicable diseases are rapidly being treated using an approach of education, lifestyle changes and empowering the patient to be responsible for their own health. Still, the same strategy is not being applied towards treating MSDs. Lewis et al. (2021) advised this strategy by stopping the use of diagnostic labels, ceasing judicious use of passive treatment, and increasing consultation times to understand the full biopsychosocial context of the patient. The same beliefs presented by the participants under the first theme are discussed by Caneiro et al. (2021) and are engrained as ‘fundamental truth’ even when presented with scientific evidence that opposes it.

6.3 PAIN ATTITUDES AND BELIEFS AND ABSENTEEISM FROM WORK

Pain attributed to MSDs has been a hindrance to productive workforces for decades, resulting extended time off from work or even permanent disability. The primary drivers of this are more recently being associated with attitudes and beliefs about pain (Fernandes et al, 2016). Knowledge of musculoskeletal health and effective action against the misinterpretation of pain attributable to MSDs will be necessary to reduce its associated disability, lost productivity, and economic liability (Crawford et al., 2020).

As Hoer and Thompson (2022) discovered, pain attitudes and beliefs are intertwined with the dimension of Control determining the level of perceived disability, self-efficacy and emotional predisposition. In the present study the dimension of Control was not found to have a significant association. It still bears implications for other domains. Keyaerts et al. (2022) also elaborated on Control being associated to the work environment as workers view it as the cause of their symptoms.

Emotion like Control, is an adaptive belief but has a greater connection to the cognitive processing response to pain, such as fear of movement, catastrophising and decision-making (Beneka et al., 2010). Yeung et al. (2012) have identified as a key factor to the resource of resilience which allows the individual to persevere despite their pain, finding activity work is beneficial to managing pain as indicated under the sub theme ‘Pink Flags’. The significant association of emotion to absenteeism stems from understanding that influences decision-making, which is treatment, as Vanhaudenhuyse et al. (2018) states, is effective in changing the pain attitudes and beliefs of the individual.

The perceived experience of disability attributed to pain from MSDs is a powerful mediating effect on the absenteeism habits of workers, noted mainly in functional tasks needed to perform their occupation (dos Santos Mota et al., 2020). In this study, disability beliefs was not found to be associated with absenteeism from work ($p = 0.946$) but a causal relationship shown between the MSD developing from a work-related injury ($p = <0.001$) and absenteeism. The causal relationship was similar to that of Alcântara et al. (2010) but cited sociodemographic circumstances as additional causal factors facilitating disability beliefs. Workers who experience an IOD may develop the belief that they cannot work as the injury occurred from a specific task.

Harm and medical cure beliefs did not significantly correlate to absenteeism from work. This does not imply that these beliefs should be wholly excluded as contributing factors, as they still have relevance to Fear-Avoidance Beliefs and the Fear-Avoidance pathway of pain (Vargas-Prada & Coggon, 2015). The bearing is affirmed by Macías-Toronjo et al. (2020) that harm and medical cure beliefs are predisposing factors FAB, catastrophic thinking, low-self efficacy and long-term sickness absence from MSDs and need to be addressed. This may not be apparent in workers during an acute stage but may manifest and worsen over time if symptoms persist (Bostick et al., 2013). This is evident under the theme 'Assessment and treatment of MSDs' that showed persistent symptoms led to more consultations, investigations, procedures and additional time off from work. If these beliefs are risk factors for absenteeism from work, specific screening is needed, and interventions such as education can be applied to mitigate that risk (Boersma et al., 2014).

Medication is a standard short-term treatment for acute musculoskeletal pain but the Biomedical Model advocates its continued use resulting in medication belief which has side effects and potentially blocks any flexibility to adopting non-pharmacological options (Karunamuni et al., 2020). According to Yu et al. (2016) this phenomenon differs between societal and cultural contexts where psychological and social support is seen more effective in treatment, and pharmacological treatments are a modality heavily imposed by the healthcare system. This demonstrates if strides are made to pursue non-pharmacological treatment for MSDs, these will become the norm among workers. This is shown within multiple themes of the qualitative results where HCPs persistently prescribed medication for symptoms that were not improving, resulting in a belief and dependency on it. A similar study by De Sola (2020) demonstrated how biomedicalisation of healthcare facilitated medication beliefs among persons with MSDs from low and middle-income households due to the difficulty of obtaining a ‘higher level’ of care that would involve non-pharmacological treatment modalities. A resolution to this would be top-down with healthcare policy-makers adopting the BPS model of health and applying it to MSK healthcare to alleviate the burden MSDs on the workforce and harmful side-effects of non-evidence-based practices (Ampiah et al., 2020; Ng et al., 2021).

Solicitude is a pain behaviour pertinent to the individual’s social environment as it is reinforced by those responding to the pain and often manifests into lower self-efficacy (Newton-John, 2002). Self-efficacy beliefs are a well-established predictor of absenteeism from work and RTW timelines in workers with MSDs (Busch et al., 2007). In a recent review by Martinez-Calderon et al. (2018), the pattern continues due to the complex multifactorial nature of pain associated with MSDs and self-efficacy. It is directly related to physical function, activity and work participation, health status, lower pain intensity and perceived disability. The workers showed declining ability to function with lower self-efficacy and comparable higher pain threshold. The workers who showed a high self-efficacy in their ability to work and perform ADLs despite having faster RTW had receding symptoms and lowered expectation of threat from the injury. This was consistent with another review by Martinez-Calderon et al. (2018) that showed self-efficacy as the determining belief to alter pain intensity and perceived level of disability. This pain behaviour is unpredictable but rooted firmly within the BPS model, and can easily be shifted for or against the favour of RTW outcomes (Martel & Sullivan, 2018). Early screening of solicitude beliefs or self-efficacy by HCPs in workers with MSDs is necessary to improve RTW timelines and prevent prolonged absenteeism from work (Duong et al., 2022).

6.4 IMPACT OF PAIN AND MSDS ON OVERALL HEALTH

It is already well established that workers experiencing pain attributable to MSDs suffer a decline in their HRQoL (Bultmann et al., 2007; Dibonaventura et al., 2011). The impact to HRQoL may be associated with the individual's pain attitudes and beliefs rather than the experience of pain itself. The present study showed that most participants for health domains except self-care experienced difficulty due to pain associated with MSDs. This is strikingly similar to previous studies by Kabir-Mokamelkhah et al. (2016), Dosea et al. (2016) and Rodriguez-Romero et al. (2015) demonstrating the direct impact MSDs have on the individual and additionally a concern among countries like South Africa with a high incidence of HIV (Van de Ven et al., 2019). This effect was also prevalent within the sub-themes 'Impact of pain on the worker'and 'Worker experience with pain', where workers did not consider themselves healthy or normal while still experiencing pain. This loss of self and depreciation in health state was a prominent theme in a systematic review by Toye et al. (2013), displaying that pain is an indicator of health and musculoskeletal health is a significant factor.

In the present study, at least one domain of pain attitudes and beliefs was associated with the domains of HRQoL, with solicitude prevalent in all except self-care. Previous studies by Alcântara et al. (2010); Bae and Sam (2016) showed that beliefs domains of harm and disability were more prevalent in impacting HRQoL. This finding should not be discounted as the effect being shown could be mediated by other factors such as occupational stress, pre-existing social circumstances and other lifestyle factors (Chakraborty et al., 2017; Vleeshouwers & Christensen, 2019). The beliefs of harm and disability were still evident under the sub-theme 'Ideas, Concerns and Expectations', proving that when counted, it does not exist, but in the worker's experience, it becomes a significant factor. This finding assents to the sometimes enigmatic interrelatedness of psychosocial factors and physical injury, as discovered in studies by Jay et al. (2018) and Broadbent et al. (2019), compelling the choices made by workers. HRQoL of a worker does not exist in a vacuum, and an MSD with a traumatic or non-traumatic origin becomes a disorder due to psychosocial influences; otherwise, pain beliefs and attitudes would have null effect on either.

6.5 THE EXPERIENCE OF WORKERS WITH MSDS

The experience of a disease, disorder or symptom is not an isolated event but develops in response to exposure to constantly shifting change ways (Haslam et al., 2021). The present study explored themes relating to their belief system and how external influences modelled it. The workers that deliberated their experience and management found themselves in a state of limbo, and as discussed is becoming the norm as healthcare systems do not agree on using a biomedical or BPS Model of care (Jull, 2017). The first central theme provided an overview of how pain attitudes and beliefs must be extracted and analysed in consultation. A clear facilitator to recovery and the development of adaptive beliefs by workers that showed recovery seem to be attributed to education. A study by Lacey et al. (2018) proved the importance of health literacy for improved outcomes from musculoskeletal pain. The second central theme explored psychosocial determinants of pain, such as yellow flags, pink flags, and environmental and social factors. Yellow flags and environmental and social factors are commonly known as psychosocial factors and facilitate ongoing pain and impact recovery times but is also not regularly assessed in persons with MSDs (Major-Helsloot et al., 2014; Oraison, 2017). The workers demonstrated influences from their family, ongoing stress and anxiety, disputes with their employer and difficulty understanding their diagnosis. All these factors are known to be associated with worker absenteeism presenting with MSDs (Abdullah et al., 2015), which indicates a need for psychosocial screening in workers to predict recovery and RTW timelines. This resonates with Gross et al. (2016) that assessments of psychosocial factors in workers with MSDs need to be standardised to establish optimal RTW and reduce unnecessary absenteeism. The converse of this would be resilience factors or pink flags that enable to maintenance work attendance while recovering. Workers expressed the influence of a work ethic inspired by their family and HCP that motivated them to continue working during their recovery. Kent et al. (2015) explored a BPS model of goal-directed resilience training that was found to be effective in pain based on developing motivation, emotion regulation and well-being within the individual.

The third theme evaluated workers' relationship with their HCPs based on the healthcare approach, knowledge of contemporary pain science and communication. The relationship quality is highly predictive of positive outcomes during recovery MSDs but requires a person-centred approach and is paramount to the recovery experience of workers (Pinto et al., 2012; Manzoni et al., 2018). HCPs adopt a biomedical approach evident in the reasoning of pain solely to pathoanatomical structures, whether the pain experience is less than three months or over twenty years. This concern previously presented by Malik et al. (2018) preserves pain as biomedical certainty, leading to mismanagement of MSDs, resulting in poor outcomes from treatment and wasteful expenditure of financial and medical resources. Workers who have been given a biomedical diagnosis now fervently search for a ‘fix’ to their pain, develop maladaptive pain beliefs, and become at risk for absenteeism from work. Similar findings were echoed by Blanchette et al. (2016) and Hudon et al. (2019) who investigated the impact of the first healthcare provider in establishing pain attitudes and beliefs in persons with MSDs, but further qualitative investigations are necessary to understand it completely. The findings from the third theme was modelled into the fourth theme through the assessment and treatment of MSDs. The workers predominantly received an assessment involving radiological investigations that may not be justifiable in all their injuries treatment including medication and passive approaches such as massage. One worker did describe exercises but these were found on her own and were not tailored to address her presentation. Management of MSDs requires an individualised approach with sound clinical communication skills, shared decision-making on treatment and education relevant to the presenting concerns (O'Keeffe, 2016). Furthermore, active approaches are needed to address lifestyle concerns, psychosocial barriers to recovery and RTW, empower workers to be responsible for their own health, and reduce the ongoing low-value care derived from biomedicalisation of healthcare (Dean & Söderlund, 2015; Hartvigsen et al., 2022).

6.6 IMPROVING SUPPORT FOR WORKERS WITH MSDS

The final theme of the qualitative results explored the complexity of the worker's experience in managing their pain attributed to MSDs, the overall impact of pain, the relevance of a person-centred approach and recommendations for HCPs. Healthcare professionals, employers and, in some cases, insurers are involved in the care and recovery of workers with MSDs. Improving the approach to addressing MSDs improves RTW and prevents persistent symptoms in workers and associated risk of absenteeism. The system may need to change its beliefs by updating general the publics knowledge on contemporary, as Jacobs et al. (2016) and Beales (2016) state that a biopsychosocially informed practice that extends further than service-level healthcare is needed to curb the burden that MSDs placed on workers. The workers indicated multiple adverse effects of the treatment they received, mainly medication, which was not improving symptoms. This behaviour enhances medicalisation of their problems and provokes development of maladaptive pain attitudes and beliefs. The negative effect of the treatment extended into their ADLs, as discovered by Lakke et al. (2012) which found the development of biomedical beliefs and subsequent psychosocial factors deteriorate the functional capacity of workers. The sub-themes that explored communication, ICE and autonomy and shared decision-making highlighted communication's positives and detriments in recovery from MSDs. Workers are seeking an understanding of the cause of their pain, and maintaining MSDs as an enigma may only preserve maladaptive and catastrophic thinking. Bartys et al. (2017) identified poor communication between the worker and relevant stakeholders as a causal factor in work disability and long-term absenteeism from work. The converse to this is that when communication is used correctly by HCPs, positive health and economic outcomes are achieved, as Wynne-Jones (2017) noted that a vocational advice service from HCPs or employers improves work outcomes. Workers want to improve, and if their autonomy is maintained, there is a higher chance of RTW occurring earlier, which will benefit the worker and associated stakeholders (Kovačević et al., 2018).

To resolve unnecessary absenteeism from work, workers negative experiences in recovery and maladaptive beliefs associated with pain attributed to MSDs, change is needed at all healthcare system levels (Main et al., 2022). The development of novel approaches, such as the Pathway of Care for common musculoskeletal conditions (PACE MSK) that is based on the BPS model of health is needed to ensure that the correct level of care is received at the proper time (Rebbeck et al., 2021). South Africa can develop similar stratified care pathways for MSDs to streamline recovery that emphasises improving worker health and recovery and reducing absenteeism from work.

6.7 SUMMARY OF THE CHAPTER

Per the objectives of this discourse, musculoskeletal healthcare and the management of MSDs in workers are not up to standard and are being addressed using a biomedical approach. The pain attitudes and beliefs of workers with MSDs influence their absenteeism from work which HCPs may perpetuate. Pain attributed to MSDs has a direct negative effect on the HRQoL of workers, and the presence of pain is a determining factor of their perceived state of health. Workers have an arduous experience managing their pain, including judicious use of medication, costly and unnecessary assessments and generally poor management of MSDs because a BPS approach is not being implemented. Workers faced numerous challenges during their recovery from MSDs, with poor communication and support from healthcare professionals and employers as primary sources. Change is needed at all healthcare system levels to reduce the personal burden of MSDs on workers and its economic burden on society.

CHAPTER SEVEN

CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

The final chapter provides a summary and conclusion of the study. The limitations of the study are discussed. Finally, recommendations that emerged based on the findings of this study are outlined.

7.2 SUMMARY OF THE STUDY

Pain is the most widely reported symptom of the global population when seeking care from a HCP. MSDs are the largest contributor to painful experiences and account for a significant portion of disability experienced by the global population. MSDs have also led to an unprecedented and largely overlooked burden on the economic workforce due to absenteeism and the direct cost of attempts to manage and treat it. LMICs, including South Africa are not excluded from this but report far less on it than higher-income countries. The overall aim of this study was to investigate the relationship between pain attitudes and beliefs, absenteeism and health-related quality of life of workers with MSDs. Secondly, the study sought to explore workers' experiences managing their pain attributable to MSDs. The approach to managing pain is still based on dualism and the biomedical model and has been ineffective in explaining pain without significant pathology. To the general public and the majority of healthcare professionals' pain is still enigmatic and regarded as a clear sign of damage which influences how we make decisions during the experience. The decisions made are based on attitudes and beliefs about pain, which are also open to change. The BPS model emphasises that the person is needed to facilitate change in attitudes and beliefs and provides an explanation for pain without significant pathology.

Pain attitudes and beliefs is based on the individual's understanding of the pain that is engrained as fundamental truth, even if there is evidence that opposes it. These attitudes and beliefs manifest into behaviours based on their perceptions and descriptions of what they experience. The challenge to healthcare professionals is understanding the biopsychosocial relationship that develops the perception within the individual experiencing pain. Attitudes and beliefs adopted by workers that are unhelpful such as pain is a sign of harm being done, disability or solicitous beliefs result in absenteeism from work and slower recovery from MSDs, even when there is no risk of further injury from performing their normal work. There is limited research in LMICs exploring the relationship between these attitudes and beliefs and absenteeism from work.

The participants in the present study had a variety of symptomatic experiences, and the majority displayed adaptive and maladaptive beliefs within sub-clinical and clinical ranges with the exception of harm beliefs. The participants accumulated over 800 lost work days resulting from MSDs. Most participants indicated difficulty in all domains of HRQoL and pain was found to be a significant indicator of general health and well-being. Their pain attitudes and beliefs influence the overall health of the participants, indicating the understanding of their pain, the response to pain may be more disabling than the pain itself. The attitudes and beliefs drive workers' experiences managing pain attributed to MSDs. HCPs are a significant contributor to this experience and understanding of pain. The assessment and treatment of MSDs focuses on the symptomatic area and not on the person experiencing it. The inappropriate and ineffective evaluation and treatment methods associated with a symptom-focused approach result in increased costs of care, adverse effects to the worker and delayed RTW in normal duties. The participants indicated a lack of understanding of their symptoms and poor communication with HCPs and other stakeholders to be driving their prolonged experiences with MSDs.

As indicated in the introduction, pain is a biopsychosocial phenomenon and requires a person-centred approach to effectively manage all elements associated with it. The attitudes and beliefs of the individual are one of those elements and influence the decisions they make in work participation. MSDs are no different to any other source of pain and indicators such as yellow flags associated with recovery are not being screened by HCPs.

Systems are facilitating the threat of MSDs on workers within economies they work in that are intended to care for their health and well-being. The relationship between a worker's attitudes and beliefs about pain, MSDs they experience and their health is an interconnected phenomenon that is constantly changing which if not addressed appropriately, can have damaging effects on the individual. The present study also showed that beliefs can change and result in positive outcomes in other aspects of the individual. However it requires a collaborative effort from HCPs and other stakeholders. The most efficient means to achieve this is a system change that extends past healthcare and acknowledges that individuals do not function in isolation.

7.3 LIMITATIONS OF THE STUDY

- Generalisability could not be established due to the survey's low response rate, which may be attributed to lower than normal attendance at research sites due to the COVID-19 pandemic. Reminders were given to the research sites to continue to invite participants that meet the inclusion criteria
- Participants were only recruited from private healthcare facilities. It will be of great interest to see if similar results are obtained from the public health sector
- The study was limited to a small geographical area. This calls for future research in more densely populated metropolitan areas.

7.4 RECOMMENDATIONS

The findings of this study prompt further research into pain attributed to MSDs and their impact on workers. These recommendations also create awareness of the changes needed to the healthcare system and relevant policy makers to reduce the economic burden of MSDs.

- More qualitative research is needed to understand the development of pain attitudes and beliefs.
- The experiences of workers with MSDs are not well understood and larger studies are needed to fill the research gaps in what they believe and experience regarding MSDs.
- A biopsychosocial approach to healthcare is needed that addresses the barriers to recovery from disease or injury. The model of healthcare at national level needs to include contemporary science with the same being educated tertiary institutions.
- Provision of health literacy specific to the prevention of MSDs to empower the general public to be responsible for their health. Implementation of this can start at the primary care level teaching primary care providers to address the causes of symptoms and not the symptoms alone relating to MSDs.
- Workshops are needed for employers and employees to create awareness on MSDs and improve prevention in and outside the work environment. State departments and occupational health services can drive prevention strategies and educate employers on creating safer work environments.
- Healthcare professionals should improve their understanding of contemporary pain science and adopt a person-centred approach.
- Guidelines need to be developed stipulating a streamlined approach to treating MSDs that reduces the wasteful expenditure of financial resources and absenteeism from work and improves worker resilience to MSDs. This can be combined effort between government's

health and finance departments to develop cost-effective methods to treat the countries commonly reported MSDs.

- Access to interdisciplinary healthcare teams needs to increase to ensure that holistic care of the worker is achieved. The number of healthcare workers specifically in rehabilitation services needs to increase substantially. This needs to be addressed at a national government level that MSDs are concern and needs to be addressed to create a healthier workforce.

7.5 SIGNIFICANCE OF THE STUDY

The present study emphasises that pain attributed to MSDs remains a complex phenomenon and is unique to each person. The attitudes and beliefs of the person influence their decisions and response to pain. Applying a mixed-methods approach provided more context into understanding the experience and possible causes relating to pain attitudes and beliefs of workers with MSDs. The experiences of workers with MSDs are not well recognised in literature, and knowing this provides insight into their needs and where healthcare can be improved. The present study highlighted key healthcare practice areas that need to improve to reduce ineffective care for workers with MSDs. It displays obvious negative implications of low-value care that need to be addressed to bolster the workforce and economy.

REFERENCES

Abdullah, M. Z., Othman, A. K., Ahmad, M. F., & Justine, M. (2015). The Mediating Role of Work-Related Musculoskeletal Disorders on the Link between. *Social Work in Public Health*, 30(1):64-74. https://doi.org/10.1080/19371918.2014.938393.

Ahenkorah, J., Moffat, F., Diver, C., & Ampiah, P. K. (2019). Chronic low back beliefs and management practices in Africa: Time for a rethink? *Musculoskeletal Care*, 17:376-381 https://doi.org/10.1002/msc.1424.

Ajayi, O., & Thwala, W. (2014). Assessment of the impact of musculoskeletal disorders on Nigerian construction workers. *Applied Research Conference in Africa (ARCA) Conference* (pp. 46-62). Accra, Ghana: Procs.

Ajidahun, A. T., & Philips, J. (2013). Prevalence of musculoskeletal disorders among instrumental musicians at a Center for Performing Artists in South Africa. *University of the Western Cape Research Repository*, 28:96-99.

Alavinia, S. M., Molenaar, D., & Burdorf, A. (2009). Productivity Loss in the Workforce: Associations with Health, Work Demands, and Individual Characteristics. *American Journal of Industrial Medicine*, (42):49-56.

Alcântara, M. A., Sampaio, R. F., Pereira, L. S., Fonseca, S. T., Silva, F. C., Kirkwood, R. N., & Mancini, M. C. (2010). Disability associated with pain—A clinical approximation of the mediating effect of belief and attitudes. *Physiotherapy Theory and Practice*, 26(7):459-467. https://doi.org/10.3109/09593980903580233.

Ampiah, P. K., Hendrick, P., Moffatt, F., & Ahenkorah, J. (2020). Operationalisation of a biopsychosocial approach for the non- pharmacological management of patients with chronic musculoskeletal pain in low- and middle-income countries: A systematic review. *Musculoskeletal Care*, 18:227-244. https://doi.org/10.1002/msc.1462.

Andersen, L. L., Fallentin, N., Thorsen, S. V., & Holterman, A. (2016). Physical workload and risk of long-term sickness absence in the general working population and among blue-collar workers: prospective cohort study with register follow-up. *Occupational and Environmental Medicine*, 1-8. https://doi.org/10.1136/oemed-2015-103314.

Andersen, N.-B. d., Kent, P., Hjort, J., & Christiansen, D. H. (2017). Clinical course and prognosis of musculoskeletal pain in patients referred for physiotherapy: does pain site matter? *BMC Musculoskeletal Disorders*, 18:130. https://doi.org/10.1186/s12891-017-1487-3.

Anney, V. N. (2015). Ensuring the Quality of the Findings of Qualitative Research: Looking at Trustworthiness Criteria. *Journal of Emerging Trends in Educational Research and Policy Studies*, 5(2):272-281.

Bae, Y.-H., & Sam, K. (2016). Associations between work-related musculoskeletal disorders, quality of life, and workplace stress in physical therapists. *Industrial Health*, 54:347-353.

Barnes, R. Y., Janse van Rensurg, A., & Raubenheimer, J. E. (2021). Referral practices of medical practitioners in central South Africa to physiotherapy services for patients living with musculoskeletal conditions. *South African Journal of Physiotherapy*, 77(1): a1563. https://doi.org/10.41.2/sajp.v77i1.1563.

Bartys, S., Pernille, F., Bendix, T., & Burton, A. K. (2017). System influences on work disability due to low back pain: an international evidence synthesis. *Journal of Health Policy*, 121(8):903-912. https://doi.org/10.1016/j.healthpol.2017.05.011.

Beales, D., Fried, K., Nicholas, M., Blyth, F., Finniss, D., & Moseley, G. L. (2016). Management of musculoskeletal pain in a compensable environment: Implementation of helpful and unhelpful Models of Care in supporting recovery and return to work. *Best Practice & Research Clinical Rheumatology*, 30:445-467. doi:10.1016/j.berh.2016.08.011.

Beales, D., Mitchell, T., Pole, N., & Weir, J. (2016). Brief biopsychosocially informed education can improve insurance workers' back pain beliefs: Implications for improving claims management behaviours. *Journal of Work*, 55:625-633. https://doi.org/10.3233/WOR-162428.

Bebetsos, E., & Kouli, O. (2010). Evaluating the emotions of patients with chronic low back pain. A preliminary examination. *Sport Science Health*, 1:17-22. https://doi.org/10.1007/s11332-010-0091-9.

Belita, A., Mbindyo, P., & English, M. (2013). Absenteeism amongst health workers - developing a typology to support empiric work in low-income countries and character associations. *Human Resources for Heealth*, 11:34. https://doi.org/10.1186/1478-4491-11-34.

Belton, J., Birkinshaw, H., & Pincus, T. (2022). Patient-centered consultations for persons with musculoskeletal conditions. *Chiropractic and Manual Therapies*, 30(1):53 https://doi.org/10.1186/s12998-022-00466-w.

Beneka, A., Malliou, P., Kouli, O., Gioftsidou, A., Papadopoulou, M., Bebestos, E., & Godolias, G. (2010). Evaluating the emotions of patients with chronic low back pain. A preliminary examination. *Sport Science Health*, 1:17-22. https://doi.org/10.1007/s11332-010-0091-9.

Besen, E., Young, A. E., & Shaw, W. S. (2015). Returning to Work following Low Back Pain: Towards a Model of Individual Psychological Factors. *Journal of Occupational Rehabilitation*, (25):25-37. https://doi.org/10.1007/s10926-014-9522-9.

Bevan, S. (2015). Economic impact of musculoskeletal disoders (MSDs) on work in Europe. *Best Practice and Research Clinical Rheumatology*, (29):356 - 373. https://doi.org/10.1016/j.berh.2015.08.002.

Bevers, K., Watts, L., Kishino, N. D., & Gatchel, R. J. (2016). The Biopsychosocial Model of the Assessment, Prevention, and Treatment of Chronic Pain. *US Neurology*, 12(2):98-104. https://doi.org/10.17925/usn.2016.12.02.98.

Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: a tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health Research*, 26(13):1802-1811. https://doi.org/10.1177/1049732316654870.

Blackwell, D. L., Lucas, J. W., & Clarke, T. C. (2014). *Summary Heath Statics for U.S. Adults: National Health Interview Survey*. Hyattsville: Centers for Diseas Control and Prevention.

Blaikie, N. (2003). Social Research and Data Analysis: Demystifying Basic Concepts. In N. Blaikie, *Analyzing Quantitative Data* (pp. 10-38). Thousand Oaks: SAGE Publications.

Blanchette, M.-A., Rivard, M., Dionne, C. E., Hogg-Johnson, S., & Steenstra, I. (2016). Workers' characteristics associated with the type of healthcare provider first seen for occupational back pain. *BMC Musculoskeletal Disorders*, 17:428. https://doi.org/10.1186/s12891-016-1298-y.

Bloomfield, J., & Fisher, M. J. (2019). Quantitative research design. *Journal of the Australasian Rehabilitation Nurses' Association*, 22(2):27-30. https://doi.org/10.33235/jarna.22.2.27-30.

Blyth, F. M., Briggs, A. M., Scheider, C. H., Hoy, D. G., & March, L. M. (2019). The Global Burden of Musculoskeletal Pain - Where to From Here. *AJPH Pain Management*, 109(1):35-40. https://doi.org/10.2105/AJPH.2018.304747.

Boersma, K., Carstens-Söderstrand, J., & Linton, S. J. (2014). From Acute Pain to Chronic Disability: Psychosocial Processes in the Development of Chronic Musculoskeletal Pain and Disability. In R. J. Gatchel, & I. Z. Schultz, *Handbook of Musculoskeletal Pain and Disability Disorders in the Workplace* (pp. 205-218). New York: Springer.

Bolton, D., & Gillet, G. (2019). Biopsychosocial Conditions of Health and Disease. In D. Bolton, & G. Gillet, *The Biopsychosocial Model of Health and Disease new philosophical and scientific developments* (pp. 109-119). Gewerbestrasse: Palgrave Pivot.

Bonzini, M., Bertu, L., Veronesi, G., Ferrario, M. M., Conti, M., & Coggon, D. (2015). Is musculoskeletal pain a consequence or a cause of occupational stress? A logitudinal study. *Arch Occup Environ Health*, 88(5):607-612. https://doi.org/10.1007/s00420-014-0928-1.

Booyens, S. J., van Wyk, P. J., & Postma, T. C. (2009). Musculoskeletal disorders amongst practising South African oral Hygienists. *South African Dentisty Journal*, 64(9):400-403.

Borrell-Carrio, F., Suchman, A. L., & Epstein, R. M. (2004). The Biopsychosocial Model 25 years later: Principles, Practice, and Scientific Inquiry. *Annals of Family Medicine*, 2(6):576-582. https://doi.org/10.1370/afm.245.

Bostick, G. P., Carroll, L. J., Brown, C. A., Harley, D., & Gross, D. P. (2013). Predictive capacity of pain beliefs and catastrophizing in Whiplash Associated Disorder. *Injury*, 44:1465-1471. https://doi.org/10.1016/j.injury.2012.10.007.

Braun, V., & Clark, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3:77-101.

Braun, V., & Clarke, V. (2020). One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qualitative Research in Psychology*, https://doi.org/10.1080/14780887.2020.1769238.

Braun, V., & Clarke, V. (2022). Conceptual and design thinking for thematic analysis Virginia. *Qualitative Psychology*, 9(1):3-26. https://doi.org/10.1037/qup0000196.

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 Aging: A report for the 2015 World Health Organisation World Report on Ageing and Health. *Gerontologist*, 56(s2):S243-S245. https://doi.org/10.1093/geront/gnw002.

Britten, N. (1995). Qualitative interviews in medical research. *BMJ Clinical Research*, 311:251-3.

Broadbent, J., Fuller-Tyszkiewicz, M., Bertino, M., & Staiger, P. K. (2018). A Network Analysis of the Links Between Chronic Pain Symptoms and Affective Disorder

Symptoms. *International Journal of Behavioural Medicine*, 1-10. https://doi.org/10.1007/s12529-018-9754-8.

Brooke, R. (2018). Descartes' dualism and the phenomenological tradion: a response to Elizabeth Urban's 'On matters of mind and body: regarding Descartes'. *Analytical Psychology*, 63(5):656-660. https://doi.org/10.1111/1468-5922.12450.

Brown, C. A., El-Deredy, W., & Jones, A. K. (2014). When the brain expects pain: common neural responses to pain anticipation are related to clinical pain and distress in fibromyalgia and osteoarthritis. *European Journal of Neuroscience*, (39):663-672. https://doi.org/10.1111/ejn.12420.

Buchholz, I., Janssen, M. F., Kohlmann, T., & Feng, Y.-S. (2018). A Systematic Review of Studies Comparing the Measurement Properties of the Three-Level and Five-Level Versions of the EQ-5D. *PharmacoEconomics*, 36:645-661.

Bultmann , U., Franche, R.-L., Hogg-Johnson, S., Cote, P., Lee, H., Severin, C., . . . Carnide, N. (2007). Health status, work limitations, and return-to-work trajectories in injured workers with musculoskeletal disorders. *Quality of Life Research*, 16:1167-1178. https://doi.org/10.1007/s11136-007-9229-x.

Bunzli, S., Smith, A., Schutze, R., & O'Sullivan, P. (2015). Beliefs underlying pain-related fear and how they evolve: a qualitative investigation in people with chronic back pain and high pain-related fear. *BMJ Open*, 5:E008847. https://doi.org/10.1136/nmjopen-2015-008847.

Bunzli, S., Watkins, R., Smith, A., Schutze, r., & O'Sullivan, P. (2013). A Qualitative Synthesis Exploring the Experience of Chronic Low-Back Pain. *Clinical Journal Pain*, 29(10):907-916.

Burmistr, I. (2018). Theories of pain, up to Descartes and after neuromatrix: what role do they have to develop future paradigms? *Pain Medicince*, 3(1).

Busch, H., Göransson, S., & Melin, B. (2007). Self-Efficacy Beliefs Predict Sustained Long-Term Sick Absenteeism in Individuals With Chronic Musculoskeletal Pain. *Pain Practice*, 7(3):234-240. https://doi.org/10.1111/j.1533-2500.2007.00134.x.

Butler, D., & Moseley, G. L. (2017). You and your Sneaky Theories. In D. Butler, & G. L. Moseley, *Explain Supercharged* (pp. 9-26). Adelaide: Noigroup Publications.

Calner, T., Isaksson, G., & Michaelson, P. (2019). Physiotherapy treatment experiences of persons with persistent musculoskeletal pain: A qualitative study. *Physiotherapy Theory and Practice*, 37(1):28-37. https://doi.org/10.1080/09593985.2019.1622162.

Caneiro, J. P., Bunzli, S., & O'Sullivan, P. (2021). Beliefs about the body and pain: the critical role in musculoskeletal pain management. *Brazilian Journal of Physical Therapy*, 25:17-29. https://doi.org/10.1016/j.bjpt.2020.06.003.

Caneiro, J. P., Smith, A., Linton, S. J., Moseley, G. L., & O'Sullivan, P. (2019). How does change unfold? an evaluation of the process of change in four people with chronic low back pain and high pain-related fear managed with Cognitive Functional Therapy: A replicated single-case experimental design study. *Behaviour Research and Therapy*, https://doi.org/10.1016/j.brat.2019.02.007.

Carleton, N. R., & Asmundson, G. J. (2012). Dispositional Fear, Anxiety Sensitivity, and Hypervigilance. In M. I. Hasenbring, A. C. Rusu, & D. C. Turk, *From Acute to Chronic Back Pain* (pp. 231-250). Croydon: Oxford University Press.

Carroll, L. J., Lis, A., Weiser, S., & Torti, J. (2015). How Well do You Expect to Recover and What Does Recovery mean, Anyway? Qualitative Study of Expectations After A

Musculoskeletal Injury. *American Physical Therapy Association*, 96:797-807. https://doi.org/10.2522/ptj.20150229.

CDC. (2020, February 12). *Work-Related Musculoskeletal Disorders & Ergonomics*. Retrieved from Centres for Disease Control and Prevention: https://www.cdc.gov/workplacehealthpromotion/health-strategies/musculoskeletal-disorders/index.html#

Chabane, S. M., Coutinho, F., Laliberte, M., & Feldman, D. (2018). Outpatient physiotherapists' attitudes and beliefs toward patients with chronic pain: A qualitative study. *Physiotherapy Theory and Practice*, https://doi.org/10.1080/09593985.2018.1481161.

Chakraborty, T., Das, S. K., Pathak, V., & Mukhopadhyay, S. (2017). Occupational stress, musculoskeletal disorders and other factors affecting the quality of life in Indian construction workers. *International Journal of Construction Management*, https://doi.org/10.1080/15623599.2017.1294281.

Chapman, C. R., Tuckett, R. P., & Woo Song, C. (2009). Pain and Stress in a Systems Perspective: Reciprocal Neural, Endocrine and Immune Interactions. *Journal of Pain*, 9(2):122-145.

Charmaz, K., Thornberg, R., & Keane, E. (2018). Evolving Grounded Theory and Social Justice Inquiry. In N. K. Denzin, & Y. S. Lincoln, *The SAGE Handbook of Qualitative Research fifth edition444* (pp. 720-776). Thousand Oaks: SAGE Publications Inc.

Chen, J. (2011). History of pain theories. *Neuroscience Bulletin*, 27(5):343-350. https://doi.org/10.1007/s12264-011-0139-0.

Cieza, A., Causey, K., Kamenov, K., Hanson, S. W., Chatterji, S., & Vos, T. (2020). Global estimates of the need for rehabilitation based on the Global Burden of Disease study 2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*, https://doi.org/10.1016/S0140-6736(20)32340-0.

Cilliers, L., & Maart, S. (2013). Attitudes, knowledge and treatment of low back pain amongst nurses in the Eastern Cape, South Africa. *African Journal of Primary Health Care and Family Medicine*, 5(1): doi:10.4102/phcfm.v5i1.535.

Clark, J., Yeowell, G., Nijs, J., & Goodwin, P. (2017). What are the predictors of altered central pain modulation in chronic musculoskeletal pain populations? A Systematic review. *Pain Physician*, (6)487-500.

Coggon, D., Ntani, G., Palmer, K. T., Felli, V. E., Harari, R., Barrero, L. H., . . . Gray, A. (2013). Disabling musculoskeletal pain in working populations: Is it the job, the person, or the culture? *PAIN*, 154(6):856-863. https://doi.org/10.1016/j.pain.2013.02.008.

Coggon, D., Ntani, G., Walker- Bone, K., Felli, V. E., Harari, R., Barrero, L. H., . . . Harcombe, H. (2020). Associations of sickness absence for pain in the low back, neck and shoulders with wider propensity to pain. *Occupational and Environmental Medicine*, 77:301-308 https://doi.org/10.1136/oemed-2019-106193.

Cohen, M., Quintner, J., & Buchanan, D. (2013). Is Chronic Pain a Disease. *Pain Medicine*, 14:1284-1288.

Coole, C., Drummond, A., Watson, P. J., & Radford, K. (2010). What Concerns Workers with Low Back Pain? Findings of Qualitative Study of Patients Referred for Rehabilitation. *Journal of Occupational Rehabilitation*, 20:472-480. https://doi.org/1010.1007/s/10926-010-9237-5.

Cope, D. G. (2014). Methods and Meanings: Credibility and Trustworthiness of Qualitative Research. *Oncology Nursing Forum*, 41(1):89-91.

Crawford, J. O., Berkovic, D., Erwin, J., Copsey, S. M., Davis, A., Giagloglu, E., . . . Woolf, A. (2020). Musculoskeletal health in the workplace. *Best Practice & Research Clinical Rheumatology*, 34:101558. https://doi.org/10.1016/j.berh.2020.101558.

Cresswell, C., Galantino, M. L., & Myezwa, H. (2020). The prevalence of fear avoidance and pain catastrophising amongst patients with chronic neck pain. *South African Journal of Physiotherapy, 76*(1), 1-9.

Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and Conducting Mixed Methods Research.* Thousand Oaks, CA: Sage Publications.

Creswell, J. W., & Plano Clark, V. L. (2018). Chapter 6 Collecting Data in Mixed Methods Research. In J. W. Creswell, & V. L. Plano Clark, *Designing and Conducting Mixed Methods Research* (pp. 264-312). Thousand Oaks: SAGE Publications.

Cridland, K., Pritchard, S., Rathi, S., & Malliaras, P. (2021). 'He explains it in a way that I have confidence he knows what he is doing': A qualitative study of patients' experiences and perspectives of rotator-cuff-related shoulder pain education. *Musculoskeletal Care*, 19:216-230. https://doi.org/10.1002/msc.1528.

Crombez, G., Eccleston, C., van Damme, S., Vlaeyen, J. W., & Karoly, P. (2012). The Fear Avoidance Model of Chronic Pain: The Next Generatio. *Clinical Journal of Pain*, (6):475-483.

Cuckler, G. A., Sisko, A. M., Keehan, S. P., Madison, A. J., Poisal, J. A., Wolfe, C. J., . . . Stone, D. A. (2013). National Health Expenditure Projections, 2012-22: Slow Growth Until Coverage Expands and Economy Improves. *Health Affairs*, 32(10):1820-1831.

da Silva Nascimento, L., & Steinbruch, F. K. (2019). “The interviews were transcribed", but how? Reflections on management research. *RAUSP Management Research*, 54(9):413-429. https://doi.org/10.1108/RAUSP-05-2019-0092.

Damasio, A. R. (1995). Ten: The Body-Minded Brain. In A. R. Damasio, *Descartes' Error Emotion, Reason and the Human Brain* (pp. 225-244). New York: Avon Books.

Darlow, B., Fullen, B. M., Dean, S., Hurley, D. A., Baxter, G. D., & Dowell, A. (2011). The association between health care professional attitudes and beliefs and the attitudes and beliefs, clinical management, and outcomes of patients with low back pain: A systematic review. *European Journal of Pain*, 16:3-17. https://doi.org/j.epain.2011.06.006.

de Andrade, D. C. (2019). Introduction for special issue on pain in developing countries. *Pain Reports*, https://doi.org/10.1097/PR9.0000000000000800.

de Beer, P., & Maja, T. M. (2016). Assessment of musculoskeletal disroders and absenteeism at a foundry. *Occupational Health Southern Africa*, 22(1): 24-29.

de Haes, H., & Bensing, J. (2009). Endpoints in medical communication research, proposing a framework of functions and outcomes. *Patient Education and Counseling*, 74:287-294. https://doi.org/10.1016/jpec.2008.12.006.

de Oliveira, B. I., Smith, A. J., O'Sullivan, P. P., Haebich, S., Fick, D., Khan, R., & Bunzli, S. (2020). ‘My hip is damaged’: a qualitative investigation of people seeking care for persistent hip pain. *British Journal of Sports Medicine*, 54:858. https://doi.org/10.1136/bjsports-2019-101281.

De Sola, H., Maquibar, A., Failde, I., Salazar, A., & Goicolea, I. (2020). Living with opioids: A qualitative study with patients with chronic low back pain. *Health Expectations*, 23:1118-1128. https://doi.org/10.1111/hex.13089.

de Vries, H. J., Reneman, M. F., Groothoff, J. W., Geertzen, J. H., & Brouwer, S. (2012). Self-reported Work ability and work performance in Work Performance in Workers with Chronic Nonspecific Musculoskeletal Pain. *Journal of Occupational Rehabilitation*, (23):1-10. https://doi.org/10.1007/s10926-012-9373-1.

Dean, E., & Söderlund, A. (2015). What is the role of lifestyle behaviour change associated with non-communicable disease risk in managing musculoskeletal health conditions with special reference to chronic pain? *BMC Musculoskeletal Disorders*, 16:87. https://doi.org/10.1186/s12891-015-0545-y.

Dibonaventura, M. d., Gupta, S., McDonald, M., & Sadosky, A. (2011). Evaluating the health and economic impact of osteoarthritis pain in the workforce: results from the National Health and Wellness Survey. *BMC Musculosketal Disorders*, 12:83. https://doi.org/10.1186/1471-2474-12-83.

Diener, I., Kargela, M., & Louw, A. (2015). Listening is therapy: Patient interviewing from a pain science perspective. *Physiotherapy Theory and Practice*, https://doi.org/10.1080/09593985.2016.1194648.

Domenichiello, A. F., & Ramsden, C. E. (2019). The silent epidemic of chronic pain in older adults. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, 93: 284-290 https://doi.org/10.1016/j.pnpbp.2019.04.006.

dos Santos Mota, P. H., de Lima, T. A., Berach, F. R., & Schmitt, A. C. (2020). Impact of musculoskeletal pain in functional disability. *Fisioterpaia e Pesquisa*, 27(1):85-92. https://doi.org/10.1590/1809-2950/19006327012020 85.

Dosea, G. S., Olivera, C. C., & Lima, S. O. (2016). Musculoskeletal symptomatology and quality of life of patients with work-related musculoskeletal disorders. *Escola Anna Nery*, 20(4) https://doi.org/10.5935/1414-8145.20160103.

Driscoll, D. L., Appiah-Yeboah, A., Salib, P., & Rupert, D. J. (2007). Merging Qualitiative and Quantitative Data in Mixed Methods Research: How To and Why Not. *Ecological and Environmental Anthropology*, 3(1):19-28.

Duffield, S. J., Ellis, M. B., Goodson, N., Walker-Bone, K., Conaghan, P. G., Margham, T., & Loftis, T. (2017). The contribution of musculoskeletal disorders in multimorbidity: Implications for practice and policy. *Best Practice and Research Clinical Rheumatology*, (31):129-144. https://doi.org/10.1016/j.berh.2017.09.004.

Duong, H. P., Garcia, A., Hilfiker, R., Léger, B., & Luthi, F. (2022). Systematic Review of Biopsychosocial Prognostic Factors for Return to Work After Acute Orthopedic Trauma: A 2020 Update. *Frontiers in Rehabilitation Sciences*, 2:791351. https://doi.org/0.3389/fresc.2021.791351.

Eberhardt, M. J., Schillers, F., Eberhardt, E. M., Risser, L., de la Roche, J., Herzog, C., . . . Leffler, A. (2021). Reactive metabolites of acetaminophen activate and sensitise the capsaicin receptor TRPV1. *Scientific Reports*, 7:12775 https://doi.org/10.1038/s41598-017-13054-3.

Emerson, A. J., Chandler, L. E., Oxendine, R. H., Huff, C. M., Harris, G. M., Baxter, G. D., & Jones, E. C. (2021). Systematic review of clinical decision-makers' attitudes, beliefs, and biases that contribute to a marginalized process of care in persistent musculoskeletal pain. Part II: case vignettes. *Physical Therapy Reviews*, https://doi.org/10.1080/10833196.2021.200289.

Engel, G. L. (1977). The need for a new medical model: a challenge for biomedicine. *Science*, 8;196(4286):129-136. https://doi.org/10.1126/science.847460.

Engel, G. L. (2012). The need for a New Medical Model: A Challenge for Biomedicine. *Psychodynamic Psychiatry*, 40(3): 377-396.

Ernstzen, D., Louw, Q., & Hillier, S. (2016). Patient perspectives about the healthcare of chronic musculoskeletal pain: Three patient cases. *African Journal of Disability*, 5(1):a216. https://doi.org/10.4102/ ajod.v5i1.216.

Etuknwa, A., Daniels, K., & Eib, C. (2019). Sustainable Return to Work: A Systemaic Review Focusing on Personal and Social Factors. *Journal of Occupational Rehabilitation*, (29):679-700.

EuroQol, G. (2017, April 18). *EQ-5D-5L, About*. Retrieved from EuroQol: https://euroqol.org/eq-5d-instruments/eq-5d-5l-about/

Fernandes, R. d., Pataro, S. M., Brasileiro de Carvalho, R., & Burdorf, A. (2016). The concurrence of musculoskeletal pain and associated work-related factors: a cross sectional study. *BMC Public Health*, 16:628. https://doi.org/10.1186/s12889-016-3306-4.

Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving Integration in Mixed Methods Designs-Principles and Practices. *Health Services Research*, 2134-2156. https://doi.org/10.1111/1475-6773.12117.

Finlay, L. (2012). 'Writing the Pain': Engaging First- Person Phenomenological Accounts. *Indo-Pacific Journal of Phenomenology*, 12: doi:10.2989/IPJP.2012.12.1.5.1113.

Finset, A. (2012). Clinician-patient interaction and health outcome: A potential impact on symptoms and quality of life in patients with pain? *Patient Education and Counseling*, 89:217-218. https://doi.org/10.1016/j.pec.2012.10.0006.

Foster, N. E., Anema, J. R., Cherkin, D., Chou, R., Cohen, S. P., Gross, D. P., . . . Maher, C. G. (2018). Prevention and treatment of low back pain: evidence, challenges, and promising directions. *The Lancet*, 391(10137):2368-2383. https://doi.org/10.1016/S0140-6736(18)30489-6.

Fraser, L. D. (2020). The past, present, and future of the biopsychosocial model: A review of The Biopsychosocial Model of Health and Disease: New philosophical and scientific developments by Derek Bolton and Grant Gillett. *New Ideas in Psychology*, 57:100755. https://doi.org/10.1016/j.newideapsych.2019.100755.

Garnett, J., Made, F., Tlotleng, N., Wilson, K., & Naicker, N. (2020). Work Related Musculoskeletal Pain in Golf Caddies-Johannesburg, South Africa. *International Journal of Environmental Research and Public Health*, 17:3617. https://doi.org/10.3390/ijerph17103617.

Gaskin, D. J., & Richard, P. (2012). The Economic costs of Pain in the United States. *The Journal of Pain*, 13(8):715 -724. https://doi.org/1010.1016/j.pain.2012.03.009.

Gatchel, R. J., McGeary, D. D., McGeary, C. A., & Lippe, B. (2014). Interdisciplinary Chronic Pain Management. *American Psychological Association*, 69(2):119-130. https://doi.org/:10.1037/a0035514.

Gcelu, A., & Kalla, A. A. (2015). Musculoskeletal disorders – disease burden and challenges in the developing world. *South African Medical Journal*, 105(12):1070-1071. https://doi.org/10.7196/SAMJ.2015.v105i12.10260.

GBD 2019 Risk Factors Collaborators (2020). Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet*, 3969(10258):1223-1249. https://doi.org/10.1016/S0140-6736(20)30752-2.

Geere, J.-A., Bartram, J., Bates, L., Danquah, L., Evans, B., Fisher, M. B., . . . Hunter, P. R. (2018). Carrying water may be a major contributor to disability from musculoskeletal disorders in low income countries: a cross-sectional survey in South Africa, Ghana and Vietnam. *Journal of Global Health*, 8(1):010406. https://doi.org/10.7189/jogh.08.010406.

Gordon, D. B., Watt-Watson, J., & Hogans, B. B. (2018). Interprofessional pain education—with, from, and about competent, collaborative practice teams to transform pain care. *Pain Reports*, 3(3):e663 https://doi.org/10.1097/PR9.0000000000000663.

Grant, M., O-Beirne-Elliman, J., Froud, R., Underwood, M., & Seers, K. (2019). The work of return to work. Challenges of returning to work when you have chronic pain: a meta-ethnography. *BMJ Open*, 9:e025743. https://doi.org/10.1136/bmjopen-2018-025743.

Gross, D. P., Bostick, G. P., & Carroll, L. J. (2016). Risk Identification and Prediction of Return to Work in Musculoskeletal Disorders. In I. Z. Schultz, & R. J. Gatchel, *Handbook of Return to Work* (pp. 207-222). New York City: Springer Science+Business.

Gupta, S. (2018). Methods and Materials in a Thesis. In S. C. Parija, & V. Kate, *Thesis Writing for Master's and Ph.D. Program* (pp. 141-151). Singapore: Springer Nature Singapore.

Gusmini, C. (2020). Should you frist cure your ignorance, healthcare professionals? *British Journal of Sports Medicine*, 54:753-754. https://doi.org/10.1136/bjsports-2019-101038.

Gustafsson, M., Ekholm, J., & Ohman, A. (2004). From Shame to Respect: Musculoskeletal Pain Patients' Experience of a Rehabilitation Programme, A Qualitative Study. *Journal of Rehabilitation Medicine*, 36:97-103. https://doi.org/10.1080/16501970310018314.

Hadi, M. A. (2016). Ensuring rigour and trustworthiness of qualitative research in clinical pharmacy. *International Journal of Clinical Pharmacy*, 38(3):641-646. https://doi.org/10.1007/ss11096-015-0237-6.

Hadi, M. A., McHugh, G. A., & Closs, S. J. (2019). Impact of Chronic Pain on Patients' Quality of Life: A Comparative Mixed-Methods Study. *Journal of Patient Experience*, 6(2):133-141 https://doi.org/10.1177/2374373518786013.

Hainline, B., Turner, J. A., Caneiro, J. P., Stewart, M., & Moseley, G. L. (2017). Pain in elite athletes—neurophysiological, biomechanical and psychosocial considerations: a narrative review. *British Journal of Sports Medicine*, 51:1259-1264. https://doi.org/10.1136/bjsports-2017-097890.

Halcomb, E. J., & Hickman, L. (2015). Mixed methods research. *Faculty of Science, Medicine and Health - Papers*, part A. 2656.

Halkoaho, A., Pietila, A.-M., Ebbesen, M., Karki, S., & Kangasniemi, M. (2015). Cultural aspects related to informed consent in health research: A systematic review. *Nursing Ethics*, 1-15. https://doi.org/10.1177/0969733015579312.

Hammersley, M. (2010). Reproducing or contructing? Some questions about transcription in social research. *The Open University Repository*, 10(5):553-569. https://doi.org/10.1177/1468794110375230.

Hartvigsen, J., Kamper, S. J., & French, S. D. (2022). Low- value care in musculoskeletal health care: Is there a way forward? *Pain Practice*, 22(Suppl. 2):65-70. https://doi.org/10.1111/papr.13142.

Haslam, S. A., Haslam, C., Jetten, J., Cruwys, T., & Bentley, S. V. (2021). Rethinking the nature of the person at the heart of the biopsychosocial model: Exploring social changeways not just personal pathways. *Social Science & Medicine*, 272:113566. https://doi.org/10.1016/j.socscimed.2020.113566.

Henschke, N., Kamper, S. J., & Maher, C. G. (2015). The Epidemiology and Economic Consequences of Pain. *Mayo foundation for Medical Education and Research*, 90(1):139-147. https://doi.org/10.1016/j.mayocp.2014.09.010.

Himalowa, S., & Frantz, J. (2012). The effect of occupationally-related low back pain on fuctional activities among male manual workers in a construction company in Cape Town, South Africa. *Occupational Health Southern Africa*, https://.handle.net/10520/EJC126278.

Hoer, J., & Thompson, K. (2022). An exploration into patients' views and beliefs about Chronic Musculoskeletal Pain (CMP). *Physiotherapy*, 114:E205-E206. https://doi.org/10.1016/j.physio.2021.12.188.

Holloway, I., Sofaer-Bennett, B., & Walker, J. (2007). The stigmatisation of people with chronic back pain. *Disability and Rehabilitation*, 29(18):1456-1464. https://doi.org/10.1080/09638280601107260.

Hoy, D., Geere, J.-A., Davatchi, F., Meggit, B., & Barrero, L. H. (2014). A time for action: Opportunities for preventing the growing burden of disability from musculoskeletal conditions in low-and-middle-income countries. *Best Practice & Research Clinical Rheumatology*, 28:377-393 doi:10.1016/j.berh.2014.07.006.

Hudon, A., Lippel, K., & MacEachen, E. (2019). Mapping first-line health care providers' roles, practices, and impacts on care for workers with compensable musculoskeletal disorders in four jurisdictions: A critical interpretive synthesis. *American Journal of Industrial Medicine*, 62:545-558. https://doi.org.10.1002/ajim.22972.

Hutting, N., Caneiro, J. P., Ong'wen, O. M., Miciak, M., & Roberts, L. (2022). Patient-centered care in musculoskeletal practice: Key elements to support clinicians to focus on the person. *Musculoskeletal Science and Practice, 57*, 102434.

Israel, G. D. (1992). Determing Sample Size. *University of Florida IFAS Extension*, PEOD6.

Ivankova, N. V., Cresswell, J. W., & Stick, S. L. (2006). Using Mixed-Methods Sequential Explanatory Design: From Theory to Practice. *Field Methods*, 18(1):3-20 https://doi.org/10.1177/1525822X05282260.

Jacobs, C. M., Guildford, B. J., Travers, W., Davies, M., & McCracken, L. M. (2016). Brief psychologically informed physiotherapy training is associated with changes in physiotherapists' attitudes and beliefs towards working with people with chronic pain. *British Journal of Pain*, 10(1):38-45. https://10.1177/2049463715600460.

Jamison, R. N., & Edwards, R. R. (2012). Integrating Pain Management in Clinical Practice. *Clinical Psychology and Medical Settings*, (19):49-64. https://doi.org/10.1007/s10880-012-9295-2.

Jamshed, S. (2014). Qualitative research method-interviewing and observation. *Journal of Basic and Clinical Pharmacy*, 5(4):87-88.

Janssens, H., Clays, E., De Clercq, B., Casini, A., De Bacquer, D., Kittel, F., & Braeckman, L. (2014). The relation between psychosocial risk factors and cause-specific long-term sickness absence. *European Journal of Public Health*, 24(3):428-433. https://doi.org/10.1093/eurpub/cku009.

Jay, K., Thorsen, S. V., Sundstrup, E., Aiguadé, R., Casaña, J., Calatayud, J., & Andersen, L. L. (2018). Fear Avoidance Beliefs and Risk of Long-Term Sickness Absence: Prospective Cohort Study among Workers with Musculoskeletal Pain. *Pain Research and Treatment*, https://doi.org/10.1155/2018/8347120.

Jensen, M. P., Turner, J. A., & Romano, J. M. (2000). Pain belief assessment: A comparison of the short and long version of the survey of pain attitudes. *Journal of Pain*, 1(2):138-150. https://doi.org/10.1016/S1526-5900(00)90099-3.

Jensen, M. P., Turner, J. A., & Romano, J. M. (2004). Pain belief assessment: A comparison of the short and long versions of the survey of pain attitudes. *The Journal of Pain*, 1(2):138-150.

Jinks, C., Ong, B. N., & O'Neil, T. (2010). "Well, it's nobody's responsibility but my own." A qualitative study to explore views about the determinants of health and prevention of knee pain in older adults. *BMC Public Health*, 10:148.

Jull, G. (2017). Biopsychosocial model of disease: 40 years on. Which wa is the pendulum swinging? *British Journal of Sports Medicine*, https://doi.org/10.1136/bjsports-2016-097362.

Kabir-Mokamelkhah, E., Bahrami-Ahmadi, A., & Aghili, N. (2016). Work-related stress and quality of life among Iranian blue-collar workers with self-reported low back pain. *Medical Journal of Islamic Republic of Iran*, 30:474.

Kalfoss, M. (2019). Translation and Adaption of Questionnaires: A Nursing Challenge. *SAGE Open Nursing*, 5:1-13. https://doi.org/10.1177/2377960818816810.

Karimi, M., & Brazier, J. (2016). Health, health-related quality of life, and quality of life: what is the difference? *White Rose Research Repository*, https://doi.org/10.1007/s40273-016-0389-9.

Karunamuni, N., Imayama, I., & Goonetilleke, D. (2020). Pathways to well-being: Untangling the causal relationships among biopsychosocial variables. *Social Sciences and Medicine*, https://doi.org/10.1016/j.socscimed.2020.112846.

Kataria, K. K., Sharma, M., Kant, S., Suri, N. M., & Luthra, S. (2021). Analyzing musculoskeletal risk prevalance among workers in developing countries: an analysis of small-scale cast-iron foundries in India. *Archives of Environmental & Occupational Health*, https://doi.org/1010.1080/19338244.2021.1936436.

Katz, J., & Rosenbloom, B. N. (2015). The golden anniversary of Melzack and Wall's gate control theory of pain: Celebrating 50 years of pain research and management. *Pain Research Managament*, 20(6):285-286.

Kent, M., Rivers, C. T., & Wrenn, G. (2015). Goal-Directed Resilience in Training (GRIT): A Biopsychosocial Model of Self-Regulation, Executive Functions, and Personal Growth

(Eudaimonia) in Evocative Contexts of PTSD, Obesity, and Chronic Pain. *Behavioural Sciences*, 5:264-304. https://doi.org/10.3390/bs5020264.

Keogh, E. (2018). Sex and Gender as Social-Contextual Factors in Pain. In T. Vervoort, K. Karos, Z. Trost, & K. M. Prkachin , *Social and Interpersonal Dynamics in Pain we don't suffer alone* (pp. 433-453). Gewerbestrasse: Springer International Publishing.

Kerns, R. D., Sellinger, J., & Goodin, B. R. (2011). Psychological Treatment of Chronic Pain. *Annual Reviews Clinical Psychology*, 7:411-434. https://doi.org/10.1146/annyrev-clinpsy-090310-120430.

Keyaerts, S., Godderis, L., Delvaux, E., & Daenen, L. (2022). The association between work-related physical and psychosocial factors and musculoskeletal disorders in healthcare workers: Moderating role of fear of movement. *Journal of Occupational Health*, 64:e12314. https://doi.org/10.1002/1348-9585.12314.

Khan, M. A., Raza, F., & Khan, I. A. (2015). Pain: History, Culture and Philosophy. *Acta medico-historica Adriatica*, 13(1):113-130.

Knittle, K. P., de Gucht, V., Hurkmans, E. J., Vlieland, T. P., Peeters, A. J., Ronday, H. K., & Maes, S. (2011). Effect of Self-Efficacy ad Physical Activity Goal Achievement on Arthritis Pain and Quality of Life in Patients with Rheumatoid Arthritis. *American College of Rheumatology*, 63 (11):1613-1619. https://doi.org/10.1002/acr.20587.

Kocakulah, M. C., Kelley, A. G., Mitchell, K. M., & Ruggieri, M. P. (2016). Absenteeism Problems And Costs: Causes, Effects and Cures. *International Business & Economics Research Journal* , 15(3): 89-96.

Koechlin, H., Coakley, R., Schechter, N., Werner, C., & Kossowsky, J. (2017). The role of emotion regulation in chronic pain: A systematic literature review. *Journal of Psychosomatic Research*, 107:38-45 doi:10.1016/j.psychores2018.02.002.

Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, 24(1):120-124. https://doi.org/10.1080/13814788.2017.1375092.

Kovačević, I., Kogler, V. M., Turković, T. M., Dunkić, L. F., Ivanec, Ž., & Petek, D. (2018). Self-care of chronic musculoskeletal pain – experiences and attitudes of patients and health. *BMC Musculoskeletal Disorders*, 19:76. https://doi.org/10.1186/s12891-018-1997-7.

Kroenke, K., Outcalt, S., Krebs, E., Bair, M. J., Wu, J., Chumbler, N., & Yu, Z. (2013). Association between anxiety, health-related quality of life and functional impairment in primary care patients with chronic pain. *General Hospital Psychiatry*, (35):359-365. https://doi.org/10.1016/j.genhosppsych.2013.03.020.

Krohm, G. (2009). Universal Health Insurance and Workers' Compensation. *Industrial Accident Boards and Commissions*, 46(2):191-208.

Kumaraveloo, K. S., & Kolstrup, C. L. (2018). Agriculture and musculoskeletal disorders in low- and middle income countries. *Journal of Agromedicine*, 23(3):227-248. https://doi.org/10.1080/1059924X.2018.1458671.

Lacey, R. J., Campbell, P., Lewis, M., & Protheroe, J. (2018). The Impact of Inadequate Health Literacy in a Population with Musculoskeletal Pain. *Health Literacy Research and Practice*, 2(4):e214-e220. https://doi.org/10.3928/24748307-20181101-01.

Lakke, S. E., Wittink, H., Geertzen, J. H., van der Schans, C. P., & Reneman, M. F. (2012). Factors That Affect Functional Capacity in Patients With Musculoskeletal Pain: A Delphi Study Among Scientists, Clinicians, and Patients. *Archives of physical medicine and rehabilitation*, 93:446-457. https://doi.org/10.1016/j.apmr.2011.10.016.

Langberg, E. M., Dyhr, L., & Davidsen, A. S. (2019). Development of the concept of patient-centredness - A systematic review. *Patient Education and Counseling*, 102:1228-1236. https://doi.org/10.1016/jpec.2019.02.023.

Langley, P., Muller-Schwefe, G., Nicolaou, A., Liedgens, H., Pergolizzi, J., & Varrassi, G. (2010). The impact of pain on labor force participation, absenteeism and presenteeism in the European Union. *Journal of Medical Economics*, (13):662-672. https://doi.org/10.3111/13696998.201.529379.

Leake, H. B., Moseley, G. L., Stanton, T. R., O'Hagan, E. T., & Heathcote, L. C. (2021). What do patient value learning about pain" A mixed-methods survey on the relevance of target concepts after pain science education. *Pain*, 162:2558-2568. doi:10.1097/j.pain.0000000000002244.

Lehman, B. J., David, D. M., & Gruber, J. A. (2017). Rethinking the biopsychosocial model of health: Understanding health as a dynamic system. *Social, Personal, Psychological Compass*, 11:e12328. https://doi.org/10.1111/spc3.12328.

Lewis, J. S., Cook, C. E., Hoffman, T. C., & O'Sullivan , P. (2020). The Elephant in the Room: Too Much Medicine in Musculoskeletal Practice. *Journal of Sports Physical Therapy*, 50(1):1-4. https://doi.org/10.2519/jspt.2020.0601.

Lewis, J. S., Stokes, E. K., Gojanovic, B., Gellatly, P., Mbada, C., Sharma, S., . . . O'Sullivan, P. (2021). Reframing how we care for people with persistent non-traumatic musculoskeletal pain. Suggestions for the rehabilitation community. *Physiotherapy*, 112:143-149.

Lewis, J., & O'Sullivan, P. (2018). Is it time to reframe how we care for people with non-traumatic musculoskeletal pain? *British Journal of Sports Medicine*, 0:1-2. https://doi.org/10.1136/bjsports-2018-099198.

Lin, I. B., O' Sullivan, P. B., Coffin, J. A., Mak, D. B., Toussaint, S., & Straker, L. M. (2013). Disabling chronic low back pain as an iatrogenic disorder: a qualitative study in Aboriginal Australians. *British Medical Journal Open*, 3: https://doi.org/bmjopen-2013-002654.

Lin, I., Wiles, L. K., Waller, R., Goucke, R., Nagree, Y., Gibberd, M., . . . O'Sullivan, P. P. (2017). Poor overall quality of clinical practice guidelines for musculoskeletal pain: a systematic review. *British Journal of Sports Medicine*, 0:1-8. https://doi.org/10.1136/bjsports-2017-098375.

Lin, I., Wiles, L., Waller, R., Goucke, R., Nagree, Y., Gibberd, M., . . . O'Sullivan, P. P. (2018). What does best practice care for musculoskeletal pain look like? Eleven consistent recommendations from high- quality clinical practice guidelines: systematic review. *British Journal of Sports Medicine*, 54:79-86. https://doi.org/10.1136/bjsports-2018-099878.

Loisel, P., Buchbinder, R., Hazard, R., Keller, R., Scheel, I., van Tulder, M., & Webster, B. (2005). Prevention of Work Disability due to Musculoskeletal Disorders: The Challenge of Implementing Evidence. *Journal of Occupational Rehabilitation*, 15(4):507-524. https://doi.org/101007/s10926-005-8031-2.

Lourens, A., Hodkinson, P., & Parker, R. (2020). Acute pain assessment and management in the prehospital setting, in the Western Cape, South Africa: a knowledge, attitudes and practices survey. *BMC Emergency Medicine*, 20:31. https://doi.org/10.1186/s12873-020-00315-0.

Louw, A., & Puentedura, E. J. (2014). Therapeutic Neuroscience Education, Pain, Physiotherapy and the Pain Neuromatrix. *Internation Journal of Health Sciences*, 2(3):33-45. https://doi.org/10.15640/ijhs.v2n3a4.

Louw, A., Diener, I., Butler, D. S., & Puentedura, E. J. (2011). The Effect of Neuroscience Education on Pain, Disability, Anxiety, and Stress in Chronic Musculoskeletal Pain. *Archives of Physical and Medical Rehabilitation*, 92:2041-2056. https://doi.org/10.1016/j.apmr.2011.07.198.

Lowvelder. (2017, November 6). *Nelspruit, a history of the town's name*. Retrieved from Lowvelder: ://lowvelder.co.za/561662/nelspruit-history-towns-name

Lumley, M. A., Cohen, J. L., Borszcz, G. S., Cano, A., Radcliffe, A. M., Porter, L. S., . . . Keefe, F. J. (2011). Pain and Emotion: A Biopsychosocial Review of Recent Research. *Journal of Clinical Psychology*, 67(9):942-968. https://doi.org/10.1002/jclp.20816.

Macías-Toronjo, I., Sánchez-Ramos, J. L., Rojas-Ocaña, M. J., & García-Navarro, E. B. (2020). Fear-Avoidance Behavior and Sickness Absence in Patients with Work-Related Musculoskeletal Disorders. *Medicina*, 56:646. https://doi.org/10.3390/medicina56120646.

Mack, N., Woodsong, C., MacQueen, K. M., Guest, G., & Namey, E. (2005). *Qualitative Research Methods: A data Collector's Field Guide.* North Carolina: Familty Health International.

Madden, V. J., O'Sullivan, P., Fisher, J., & Malambule, B. (2013). 'Our Training Left us Unprepared' - Two Physiotherapists' Reflections After Working With Women With L Back Pain in a Rural Zulu Community in South Africa. *Journal of Community and Health Sciences*, 8(2).

Main, C. J., Buchbinder, R., Porcheret, M., & Foster, N. (2010). Addressing patient beliefs and expectations in the consultation. *Best Practice & Research Clinical Rheumatology 24*, 24:219-225. https://doi.org/10.1016/j.berh.2009.12.013.

Main, C. J., Kendall, N. A., & Hasenbring, M. I. (2012). Screening of Psychosocial Risk Factors (Yellow Flags) for Chronic Back Pain and Disability. In M. I. Hasenbring, A. C. Rusu, & D. C. Turk, *From Actute to Chronic Back Pain* (pp. 203-230). Croydon: Oxford University Press.

Main, C. J., Shaw, W. S., Nicholas, M. K., & Linton, S. J. (2022). System-level efforts to address pain-related workplace challenges. *PAIN*, 163(8): https://doi.org/10.1097/j.pain.0000000000002548.

Major-Helsloot, M. E., Crous, L. C., Grimmer-Somers, K., & Louw, Q. A. (2014). Management of LBP at primary care level in South Africa: up to standards? *African Health Sciences*, 14(3):698-706 doi:10.4314/ahs.v14i3.28.

Malfliet, A., Kregel, J., Meeus, M., Roussel, N., Danneels, L., Cagnie, B., . . . Nijs, J. (2018). Blended-Learning Pain Neuroscience Education for People with Chronic Spinal Pain: Randomised Controlled Multicenter Trial. *American Physcial Therapy Association*, (98):357-368. https://doi.org/10.1093/ptj/pzx092.

Malik, K. M., Beckerly, R., & Imani, F. (2018). Musculoskeletal Disorders a Universal Source of Pain and Disability Misunderstood and Mismanaged: A Critical analysis Based on the U.S. Model of Care. *Anesthesiology and Pain Medicine*, 8(6):e85532. https://doi.org/10.5812/aapm.85532.

Mallick-Searle, T., Sharma, K., Toal, P., & Gutman, A. (2021). Pain and Function in Chronic Musculoskeletal Pain —Treating the Whole Person. *Journal of Multidisciplinary Heathcare*, 14:335-347.

Manjiani, D., Paul, D. B., Kunnumpurath, S., Kaye, A. D., & Vadivelu, N. (2014). Availability and utilisation of Opiods for Pain Management: Global Issues. *The Ochsner Journal*, 14(2):208-215.

Marshall, D., Khudairy, A. A., Dunbar, M. J., & Noseworthy, T. (2015). Reliability and validity of the EQ-5D-5L compared to the EQ-5D-3L in patients with osteoarthiritis referred for hip and knee replacement. *Quality of Life Research*, https://doi.org/10.1007/s11136-014-0910-6.

Martel, M. O., & Sullivan, M. J. (2018). Chapter 5 Pain Behaviour: Unitary or Multidimensional Phenomenon? In T. Vervoort, K. Karos, Z. Trost, & K. M. Prkachin, *Social and Interpersonal Dynamics in Pain* (pp. 79-100). Cham: Springer International Publishing AG.

Martinez-Calderon, J., Struyf, F., Meeus, M., & Luque-Suarez, A. (2018). The association between pain beliefs and pain intensity and/or disability in people with shoulder pain: a systematic review. *Musculoskeletal Science & Practice*, 37:29-57. https://doi.org/10.1016/J.MSKSP.2018.06.010.

Martinez-Calderon, J., Zamora-Campos, C., Navarrro-Ledesma, S., & Luque-Suarez, A. (2018). The Role of Self-Efficacy on the Prognosis of Chronic Musculoskeletal Pain:

A Systematic Review. *The Journal of Pain*, 19(1):10-34. https://doi.org/10.1016/j.jpain.2017.08.008.

McCluskey, S., de Vries, H., Reneman, M., Brooks, J., & Brouwer, S. (2015). 'I think positivity breed positivity': a qualitative exploration of the role of family members in supporting those with chronic musculoskeletal pain to stay at work. *BMC Family Practice*, 16:85.

McGrath, C., Palmgren, P. J., & Liljedahl, M. (2019). Twelve tips for conducting qualitative research interviews. *Medical Teacher*, 41(9):1002-1006. https://doi.org/10.1080/0142159X.2018.1497149.

McKenna, L., & Gray, R. (2018). The importance of ethics in research publications. *Collegian*, 25:147-148. https://doi.org/10.1016/j.colegn.2018.02.006.

Mead, N., & Bower, P. (2000). Patient-centredness: a conceptual framework and review of the empirical literature. *Social Science & Medicine*, 51:1087-1110.

Meagher, M. W., Arnau, R. C., & Rhudy, J. L. (2001). Pain and Emotion: Effects of Affective Picture Modulation. *Psychosomatic Medicine*, 63:79-90.

Meier, M. L., Vrana, A., Humphreys, B. K., Seifritz, E., Stämpfli, P., & Schweinhardt, P. (2018). Pain-Related Fear-Dissociable Neural Sources of Differenct Fear Constructs. *eNeuro*, 5(6):e107-18. https://doi.org/10.1523/ENEURO.0107-18.2018.

Meisingset, I., Vasseljen, O., Vøllestad, N. K., Robinson, H. S., Engebretsen, K. B., Glette, M., . . . Skarpsno, E. S. (2020). Novel approach towards musculoskeletal phenotypes. *European Journal of Pain*, 24:921-932. https://doi.org/10.1002/ejp.1541.

Michaelis, C., Kristiansen, M., & Norredam, M. (2015). Quality of life and coping strategies among immigrant women living with pain in Denmark: a qualitative study. *British Medical Journal Open*, 5:e008075. https://doi.org/10.1136/bmjopen-2015-008075.

Moayedi, M., & Davis, K. D. (2013). Theories of pain: from specificity to gate control. *Journal of Neurophysiology*, 109:5-12. https://doi.org/10.1152/jn.00457.2012.

Mohammadi, S., Alinajimi, F., Esmaeilian, N., Dehghani, M., & Khatibi, A. (2020). Pain Catastrophizing Thoughts Explain the Link Between Perceived Caregiver Responses and Pain Behaviors of Patients With Chronic Musculoskeletal Pain. *Frontiers in Psychology*, 11:1386. https://doi.org/10.3389/fpsyg.2020.01386.

Mona, G. G., Chimbari, M. J., & Hongoro, C. (2019). A systematic review on occupational hazards, injuries and diseases among police officers worldwide: Policy implications for the South African Police Service. *Journal of Occupational Medicine and Toxicology*, 14(1):1-15. https://doi.org/10.1186/s12995-018-0221-x.

Moradi-Lakeh, M., Forouzanfar, M. H., Vollset, S. E., Bcheraoui,, C. E., Daoud, F., Afshin, A., . . . Mokdad, A. H. (2017). Burden of musculoskeletal disorders in the Eastern Mediterranean Region, 1990–2013: findings from the Global Burden of Disease Study 2013. *Annals of Rheumatology Disorders*, 76:1365-1373. https://dpi.org/10.1136/annrheumdis-2016-210146.

Moseley, G. L., & Butler, D. S. (2015). Fifteen Year of Explaining Pain: The Past, Present, and Future. *The Journal of Pain*, 16(9):807-813. https://doi.org/10.1016/j.pain.2015.05.005.

Moseley, G. L., Thacker, M., & Walton, D. (2015). Critical updates in chronic pain. *World Confederation for Physical Therapy Congress.* Singapore: World Confederation for Physical Therapy.

Mukul, S., Jones, M., & Kumar, S. (2014). Physiotherapists' assessment of patients' psychosocial status: Are we standing on thin ice? A qualitative descriptive study. *Manual Therapy*, doi:10.1016/j.math.2014.10.004.

Murgatroyd, D. F., Casey, P. P., Cameron, I. D., & Harris, I. A. (2015). The Effect of Financial Compensation on Health Outcomes following Musculoskeletal Injury: Systematic Review. *PLOS One*, https://doi.org/1010.1371/journal.pone.0117597.

Naidoo, S., Kromhout, H., London, L., Naidoo, R., & Burdorf, A. (2009). Musculoskeletal Pain in Women Working in Small-Scale Agriculture in South Africa. *American Journal of Industrial Medicine*, 52:202-209. https://doi.org/10.1002/ajim.20662.

Naughton, C. A. (2018). Patient-Centered Communication. *Pharmacy*, 6:18. https://doi.org/10.3390/pharmacy6010018.

Navratilova, E., & Porreca, F. (2014). Reward and motivation in pain and pain relief. *Natural Neuroscience*, 17(10):1304-1312. https://doi.org/10.1038/nn.3811.

Neogi, T. (2013). The epidemiology and impact of pain in osteoarthritis. *Journal of Osteotharthritis and Cartilage*, 21:1145-1153. https://doi.org/1010.1016/joca.2013.03.018.

Neupane, S., Leino-Arjas, P., Nygård, C.-H., Miranda, H., Siukola, A., & Virtanen, P. (2014). Does the association between musculoskeletal pain and sickness absence due to musculoskeletal diagnoses depend on biomechanical working conditions?

International Archives of Occupational and Environmental Health, https://doi.org/1010.1007/s00420-014-0957-2.

Newton-John, T. (2002). Solicitousness and chronic pain: a critical review. *Pain Reviews*, 9:7-27. https://doi.org/10.1191/0968130202pr186ra.

Newton-John, T. (2002). Solicitousness and chronic pain: a critical review. *Pain Reviews*, 9:7-27. doi:10.1191/0968130202pr186ra.

Ng, W., Slater, H., Starcevich, C., Wright, A., Mitchell, T., & Beales, D. (2021). Barriers and enablers influencing healthcare professionals' adoption of a biopsychosocial approach to musculoskeletal pain: a systematic review and qualitative evidence synthesis. *Pain*, 00:1-32. https://doi.org/10.1097/j.pain.0000000000002217.

Ng, Y. M., Voo, P., & Maakip, I. (2019). Psychosocial factors, depression, and musculoskeletal disorders among teachers. *BMC Public Health*, 19:234. https://doi.org/10.1186/s12889-019-6553-3.

Nijs, J., Leysen, L., Vanlauwe, J., Logghe, T., Ickmans, K., Polli, A., . . . Huysmans, E. (2019). Treatment of central sensitisation in patients with chronic pain: time for change? *Expert Opinion on Pharmacoptherapy*, https://doi.org/10.1080/14656566.2019.1647166.

Nijs, J., Roussel, N., van Wilgen, C. P., Koke, A., & Smeets, R. (2013). Thinking beyond muscles and joints: Therapists' and patients' attitudes and beliefs regarding chronic musculoskeletal pain are key to applying effective treatment. *Manual Therapy*, 18:96-102. https://doi.org/10.1016/jmath.2012.11.001.

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analyis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*, 16:1-13. https://doi.org/10.1177/1609406917733847.

Nulty, D. D. (2008). The adequacy of reponse rates to oline and paper surveys what can be done. *Assessment and Evaluation in Higher Education*, 33(3):301-314. doi:10.1080/02602930701293231.

OCSA. (2014, August 11). *Economy: The true price of absenteeism*. Retrieved March 11, 2018, from OCSA: http://www.ocsa.co.za/economy-the-true-price-of-absenteeism/

O'Keeffe, M., Cullinane, P., Hurley, J., Leahy, I., Bunzli, S., O'Sullivan, P. B., & O'Sullivan, K. (2016). What Influences Patient-Therapist Interactions in Musculoskeletal. *American Journal of Physical Therapy*, 96(5):609-622 https://doi.org/10.2522/ptj.20150240.

Omair, A. (2015). Selecting the appropriate study design for your research: Descriptive study designs. *Journal of Health Specialties*, 3(3):153-156.

Ong, W.-Y., Stohler, C. S., & Herr, D. R. (2019). Role of the Prefrontal Cortex in Pain Processing. *Molecular Neurobiology*, 56:1137-1166. https://doi.org/10.1007/s12035-018-1130-9.

Onyeka, T. C., & Chukwuneke, F. N. (2014). Pain research in Africa: a ten year bibliometric survey. *Journal of Anesthesia*, 28:511-516 https://doi.org/10.1007/s00540-013-1767-5.

Oraison, H. M. (2017). Living with Back Pain; a Biopsychosocial Analysis of Contributing Factors. *Victoria University Research Repository*, https://doi.org/10.13140/RG.2.2.31190.91200.

Orhan, C., Van Looveren, E., Cagnie, B., Mukhtar, N. B., Lenoir, D., & Meeus, M. (2018). Are Pain Beliefs, Cognitions, and Behaviours Influenced by Race, Ethnicity, and Culture in Patients with Chronic Musculosketal Pain: A Systematic Review. *Pain Physician*, 21:541-558.

Outcalt, S. D., Kroenke, K., Krebs, E. E., Chumbler, N. R., Wu, J., Yu, Z., & Bair, M. J. (2015). Chronic pain and comorbid mental health conditions: independent associations of posttraumatic stress disorder and depression with pain, disability and quality of life. *Journal of Behavioural Medicine*, 38:535-543. https://doi.org/10.1007/s10865-015-9628-3.

Parker, R., & Jelsma, J. (2010). The prevalence and functional impact of musculoskeleta conditions amongst clients of a primary health care facility in an under-resourced are of Cape Town. *BMC Musculoskeletal disorders*, 11:2. https://doi.org/10.1186/1471-2474-11-2.

Parker, R., Stein, D. J., & Jelsma, J. (2014). Pain in people living with HIV/AIDS: a systematic review. *Journal of the International AIDS Society*, 17: https://doi.org/10.1/7448/IAS.17.1.18719.

Perl, E. R. (2011). Pain mechanisms: A commentary on concepts and issues. *Progress in Neurobiology*, 94:20-38. https://doi.org/10.1016/j.pneurobio.2011.03.001.

Phairah, K., Brink, M., Chirwa, P., & Todd, A. (2016). Operator Work-Related Musculoskeletal Disorders during forwarding operations in South Africa: An ergonomic assessment. *Southern Forests*, 78(1):1-9. https://doi.org/10.2989/20702620.2015.1126781.

Pierobon, A., Villalba, F., Ferreira, G., & Maher, C. G. (2021). Insights into low back pain management in Argentina. *Brazillian Journal of Physical Therapy*, 25:659-663. https://doi.org/1010.1016/j.bjpt.2021.02.005.

Ploner, M., Sorg, C., & Gross, J. (2017). Brain Rhythms of Pain. *Journal of Trends in Cognitive Sciences*, 21(2):100-110. https://doi.org/10.1016/j.tics.2016.12.001.

Polit, D. F., & Beck, C. T. (2010). Generalisation in quantitative and qualitative research: Myths and strategies. *International Journal of Nursing Studies*, 47:1451-1458. https://doi.org/10.1016/j.inurstu.2010.06.004.

Poulain, C., Kerneis, S., Rozenberg, S., Fautrel, B., Bourgeois, P., & Foltz, V. (2010). Long-term return to work after a functional restoration program for chronic low-back pain patients: a prospective study. *European Spine Journal*, 19:1153-1161. https://doi.org/10.1007/s00586-010-1361-6.

Prang, K.-H., Newnam, S., & Berecki-Gisolf, J. (2018). "That's what you do for people you love": A qualitative study of social support and recovery from a musculoskeletal injury. *PLOS One*, https://doi.org/10.1371/journal.pone.0196337.

Rabie, H., Malakoutikhah, M., Vaziri, M. H., & Sahlabadi, A. S. (2021). The Prevalence of Musculoskeletal Disorders among Miners around the World: A Systematic Review and Meta-Analysis. *Iranian Journal of Public Health*, 50(4):676-688.

Raja, S. N., Carr, D. B., Cohen, M., Finnerup, N. B., Flor, H., Gibson, S., . . . Vader, K. (2020). The Revised IASP definition of pain: concepts, challenges, and compromises. *Pain*, 161(9):1976-1982 https://doi.org/10.1097/j.pain.0000000000001939.

Rasmussen, B., Sweeny, K., & Sheehan, P. (2017). *Economic Costs of Absenteeism, Presenteeism aand Early Retirement Due to Ill Health: A Focus on South Africa.* Melbourne: Victoria Institue of Strategic Economic Studies.

Rauf, W. N., Meyer, H. P., & Marcus, T. S. (2014). The impact of chronic pain on the quality of life of patients attending primary healthcare clinics. *South African Journal of Anaesthesiology and Analgesia*, 20(2):122-126.

Rauscher, L., & Greenfield, B. H. (2009). Advancements in Contemporary Physical Therapy Research: Use of Mixed Methds Designs. *American Physical Therapy Association*, 89(1):91-100. https://doi.org/10.2522/ptj.20070236.

Rebbeck, T., Evans, K., Ferreira, P., Beales, D., Sterling, M., Bennell, K. L., . . . Simic, M. (2021). Implementation of a novel stratified PAthway of CarE for common musculoskeletal (MSK) conditions in primary care: protocol for a multicentre pragmatic randomised controlled trial (the PACE MSK trial). *BMJ Open*, 11:e057705. https://doi.org/10.1136/ bmjopen-2021-057705.

Rethorn, Z. D., Rethorn, T. J., Cook, C. E., Sharpe, J. A., Hastings, N., & Allen, K. F. (2022). Association of Burden and Prevalence of Arthritis with Disparities in Social Risk Factors, Findings From 17 US States. *Preventing Chronic Disease*, 19:210277. https://doi.org/10.5888/ped19.210277.

Rhudy, J. L., Williams, A. E., McCabe, K. M., Rambo, P. L., & Russell, J. L. (2006). Emotional modulation of spinal nociception and pain: The impact of predictable noxious stimulation. *Pain*, 126:221-233. https://doi.org/10.1016/j.pain.2006.06.027.

Riley III, J. L., Cruz-Almeida, Y., Glover, T. L., King, C. D., Goodin, B. R., Sibille, K. T., . . . Fillingim, R. B. (2014). Age and race effects on pain sensitivity and modulation among middle-aged and older adults. *Journal of Pain*, 15(3):272-282. https://doi.org/10.1016/j.pain.2013.10.015.

Rios, R., & Zautra, A. J. (2011). Socioeconomic Disparities in Pain: Role of Economic Hardship and Daily Financial Worry. *Health Psychology*, (1):58-66.

Robinson, V., King, R., Ryan, C. G., & Martin, D. J. (2016). A qualitiative exploration of people's expereinces of pain neurophysiological education for chronic pain: The importance of relevance for the individual. *Manual Therapy*, 22:56-61. https://doi.org/10.1016/j.math.2015.10.001.

Rodriguez-Romero, B., Pita-Fernández, S., & Pértega-Díaz, S. (2015). Impact of musculoskeletal pain on health-related quality of life among fishing sector workers. *Clinical Rheumatology*, 34(6):1131-1139. https://doi.org/10.1007/s10067-014-2550-1.

Roelen, C. A., van Hoffen, M. F., Waage, S., Schaufeli, W. B., Twisk, J. W., Bjorvatn, B., . . . Pallesen, S. (2018). Psychosocial work environment and mental health-related long-term sickness absence among nurses. *International Archives of Occupational and Environmental Health*, 91:195-203. https://doi.org/10.1007/s00420-017-1268-1.

Roldan, C., & Hu, N. (2015). Myofascial Pain Syndromes in the Emergency Department: What are we Missing? *The Journal of Emergency Medicine*, 49(6):1004-1010. https://doi.org/10.1016/j.jemermed.2015.04.027.

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. https://doi.org/10.17159/2078-516X/2016/v28i2a1109.

Rusu, A. C., & Pincus, T. (2012). Cognitive Processing and Self-Pain Enmeshment in Chronic Back Pain. In M. I. Hasenbring, A. C. Rusu, & D. C. Turk, *From Acute to Chronic Back Pain* (pp. 315-338). Croydon: Oxford University Press.

Ryan, F., Coughlan, M., & Cronin, P. (2009). Interviewing in qualitative research: The one-to-one interview. *International Journal of Therapy and Rehabilitation*, 16(6):309-314.

Sagan, D., Margulis, L., & Guerrero, R. (1997). Descartes, Dualism, and Beyond. In L. Margulis, & D. Sagan, *Slanted Truths, essays on Gaia, Symbiosis and Evolution* (pp. 171-184). New York: Springer-Verlag.

Sam, S., Sharma, R., Corp, N., Igwesi-Chidobe, C., & Babatunde, O. O. (2020). Shared decision making in musculoskeletal pain consultations in low- and middle-income countries: a systematic review. *International Health*, 12:445-471. http://doi:10.1093/inthealth/ihz077.

Scharwz, J., Rief, W., Radkovsky, A., Berking, M., & Kleinstäuber, M. (2017). Negative affect as mediator betweem emotion regulation and medically unexplained symptoms. *Journal of Psychsomatic Research*, 101:114-121. https://doi.org/10.1016/j.psychores.2017.08.010.

Schierhout, G., & Bridger, R. S. (1995). Work related musculoskeletal disorders and ergonomic stressors in the South African workforce. *Occupational and Environmental Medicine*, 52:46-50. https://doi.org/10.1136/oem.52.1.46.

Schirbel, A., Reichert, A., Roll, S., Baumgart, D. C., Büning, C., Wittig, B., . . . Sturm, A. (2010). Impact of pain on health-related quality of life in patients with inflammatory bowel disease. *World Journal of Gastroenterology*, 16(25):3168-3177. https://doi.org/10.3748/wjg.v16.i25.3168.

Sears, J. M., Blanar, L., Bowman, S. M., Adams, D., & Silverstein, B. A. (2013). Predicting Work-related Disability and Medical Cost Outcomes: Estimating Injury severity scores from workers' compensation Data. *Journal of Occupational Rehabilitation*, 23:19-31. https://doi.org/10.1007/s10926-012-9377-x.

Sheikhzadeh, A., Wertli, M. M., Weiner, S. S., Rassmussen-Barr, E., & Weiser, S. (2021). Do psychological factors affect outcomes in musculoskeletal shoulder disorders? A systematic review. *BMC Musculoskeletal Disorders*, 22(1):560. https://doi.org/10.1186/s12891-021-04359-6.

Sibille, K. T., Chen, H., Bartley, E. J., Riley III, J., Glover, T. L., King, C. D., . . . Fillingim, R. B. (2017). Accelerated aging in adults with knee osteoarthritis pain: consideration for frequency, intensity, time, and total pain sites. *Pain Reports*, 2:e591. https://doi.org/10.1097/PR9.0000000000000591.

Singla, M., Jones, M., Edwards, I., & Kumar, S. (2014). Physiotherapists' assessment of patients' psychosocial status: Are we standing on thin ice? A qualitative descriptive study. *Manual Therapy*, 1-7. https://dx.doi.org/10.1016/jmath.2014.10.004.

Smith, R. C. (2021). Making the biopsychosocial model more scientific—its general and specific models. *Social Science & Medicine*, https://doi.org/10.1016/j.socscimed.2020.113568.

Sorondo, D., Delpierre, C., Côté, P., Salmi, L.-R., Cedraschi, C., Taylor-Vaisey, A., & Lemeunier, N. (2021). Determinants of clinical practice guidelines' utilization for the management of musculoskeletal disorders: a scoping review. *BMC Musculoskeletal Disorders*, 22:507. https://doi.org/10.1186/s12891-021-04204-w.

Stats SA. (2021). *Mid-year population estimates.* Pretoria: Department of Statisics South Africa.

Stewart, W. F., Ricci, J. A., Chee, E., Morganstein, D., & Lipton, R. (2003). Lost Productive TIm and Cost due to Common Pain conditions in the US Workforce. *Journal of the American Medical Association*, 290(18):2443-2454.

Sundstrup, E., Seeberg, K. G., Bengsten, E., & Andersen, L. L. (2020). A Systematic Review of Workplace Interventions to Rehabilitate Musculoskeletal Disorders Among Employees with Physical Demanding Work. *Journal of Occupational Rehabilitation*, 30:588-612. https://doi.org/10.1007/s10926-020-09879-x.

Sutherland, S. (2017). Introduction to Quantitative Research. In J. R. Gray, S. K. Grove, & S. Sutherland, *Burns and Grove's The Practice of Nursing Research: appraisal, synthesis and generation of evidence* (pp. 83-121). St Louis: Elsevier.

Taibi, Y., Metzler, Y. A., Bellingrath, S., & Müller, A. (2021). A systematic overview on the risk effects of psychosocial work characteristics on musculoskeletal disorders, absenteeism, and workplace accidents. *Applied Ergonomics*, 95:103434. https://doi.org/10.1016/j.apergo.2021.103434.

Takura, T., Ushida, T., Kanchiku, T., Ebata, N., Fujii, K., DiBonaventura, M. d., & Taguchi, T. (2015). The societal burden of chronic pain in Japan: an internet survey. *The Japanese Orthopaedic Association*, 20:750-760 https://doi.org/10.1007/s00776-015-0730-8.

Tarimo, N., & Diener, I. (2017). Knowledge, attitudes and beliefs on contributing factors among low back pain patients attending outpatient physiotherapy physiotherapy treatment in Malawi. *South African Journal of Physiotherapy*, 73(1):a395. https://doi.org/10.42102/sajp.v73i1.395.

Taylor, S. S., Davis, M. C., Yeung, E. W., Zautra, A. J., & Tennen, H. A. (2016). Relations between adaptive and maladaptive pain cognitions and within-day pain exacerbations in individuals with fibromyalgia. *Journal of Behavioural Medicine*, 40:458-467. https://doi.org/10.1007/s/10865-016-9811-1.

Temesgen, M. H., Belay, G. J., Gelaw, A. Y., Janakiraman, B., & Animut, Y. (2019). Burden of shoulder and/neck pain among school teachers in Ethiopia. *BMC Musculoskeletal Disorders*, 20:18. https://doi.org/1010.1186/s12891-019-2397-3.

Tetteh, E. K. (2012). Responding to challenges of social health insurance in African countries. *Development of Southern Africa*, 29(5):657-681. https://doi.org/10.1080/0376835X.2012.730964.

Theodore, B. R., Mayer, T. G., & Gatchel, R. J. (2015). Cost-Effectiveness of Early Versus Delayed Functional Restoration for Chronic Disabling Occupational Musculoskeletal Disorders. *Journal of Occupational Rehabilitation*, 25:303-315. https://doi.org/1010.1007/s10926-014-9539-0.

Timans, R., Wouters, P., & Heilbron, J. (2019). Mixed methods research: what it is and what. *Theory and Society*, 48:193-216. https://doi.org/10.1007/s11186-019-09345-5.

Toye, F. (2015). 'Not everything that can be counted counts and not everything that counts can be counted. *British Journal of Pain*, 9(1):7. https://doi.org/1010.1177/2049463714565569.

Toye, F., Belton, J., Hannink, E., Seers, K., & Barker, K. (2021). A Healing Journey with Chronic Pain: A Meta-Ethnography Synthesising 195 Qualitative Studies. *Pain Medicine*, 22(6):1333-1344. https://doi.org/1010.1093/pm/pnaa373.

Toye, F., Seers, K., & Barker, K. L. (2017). Meta-ethnography to understand healcare professionals' experience of treating adults with chronic non-malignant. *BMJ Open*, 7:e018411. https://doi.org/1010.1136/bmjopen-2017-018411.

Toye, F., Seers, K., Allcock, N., Briggs, M., Carr, E., & Barker, K. (2014). Meta-ethnography 25 years on: challenges and insights for synthesising a large number of qualitative studies. *BMC Medical Research Methodology*, 14:80. https://doi.org/1010.1186/1471-2288-14-80.

Tsagareli, M. G. (2017). Pain medicine: general view to the problem. *Pain Medicine Journal*, 2(1).

Turk, D. C., Fillingim, R. B., Ohrbach, R., & Patel, K. V. (2016). Assessment of Pschyosocial and Functional Impact of Chronic Pain. *The Journal of Pain*, 17(9):T21-T49. https://doi.org/10.1016/j.pain.2016.02.006.

Van de Ven, N. S., Ngalamika, O., Martin, K., Davies, K. A., & Vera, J. H. (2019). Impact of musculoskeletal symptoms on physical functioning and quality of life among treated people with HIV in high and low resource settings: A case study of the UK and Zambia. *PLoS ONE*, 14(5):e0216787. https://doi.org/10.1371/jornal.pone.0216787.

Van Eerd, D., Munhall, C., Rempel, D., Brewer, S., van der Beek, A. J., Dennerlein, J. T., . . . Amick, B. (2016). Effectiveness of workplace interventions in the prevention of upper extremity musculoskeletal disorders and symptoms: an update of the evidence. *Occupational and Environmental Medicine*, 73:62-70. https://doi.org/10.1136/oemed-2015-102992.

Van Teijlingen, E. R., & Hundley, V. (2002). The Importance of Pilot Studies. *Nursing Standard*, 16(40):33-36. https://doi.org/10.7748/ns2002.06.16.40.33.c3214.

van Vreede, J. J., Parker, R., & van Nugteren, J. (2022). A histroy of depression in patients attending a chronic pain management clinic in South Africa: A retrospective chart review. *South African Journal of Psychiatry*, 28(0): https://doi.org/104102/sajpsychiatry.v28i0.1673.

Vangronsveld, K. L., & Linton, S. J. (2012). The effect of validating and invalidating communication on satisfaction, pain and affect in nurses suffering from low back pain during a semi-structured interview. *European Journal of Pain*, 16:239-246. https://doi.org/10.1016/j.ejpain.2011.07.009.

Vanhaudenhuyse, A., Gillet, A., Malaise, N., Salamun, I., Grosdent, S., Maquet, D., . . . Faymonville, M.-E. (2018). Psychological interventions influence patients' attitudes and beliefs about their chronic pain. *Journal of Tradional and Complementary Medicine*, 8:296-302. https://doi.org/10.1016/j.jtcme.2016.09.001.

Vargas-Prada, S., & Coggon, D. (2015). Psychological and Psychosocial Determinants of Musculoskeletal Pain and Associated Disability. *Best Practice Research Clinical Rheumatology*, 29(3):374-390. https://doi.org/10.1016/j.berh.2015.03.003.

Varghese, A., & Panicker, V. V. (2022). Impact of musculoskeletal disorders on various agricultural operations: a systematic review. *Sådhanå*, 47:46. https://doi.org/10.1007/s12046-022-01809-2.

Vleeshouwers, J., Knardahl, S., & Christensen, J. O. (2019). A prospective study of work-private life confilct and number of pain sites: moderated mediation by sleep problems and support. *Journal of Behavioural Medicine*, 42:234-245. https://doi.org/10.1007/s10865-018-9957-0.

Vranceanu, A.-M., Elbon, M., & Ring, D. (2011). The Emotive Impact of Orthopedic Words. *Journal of Hand Therapy*, https://doi.org/10.1016/j.jht.2010.10.010.

Waddell, G. (1996). Low Back Pain: A Tentieth Century Health Care Enigma. *Spine*, 21(24):2820-2825.

Wallwork, S. B., Bellan, V., Catley, M. J., & Moseley, G. L. (2015). Neural representations and the cortical body matrix: implications for sports medicine and future directions.

British Journal of Sports Medicine, 0:1-8. https://doi.org/10.1136/bjsports-2015-095356.

Wang, C., PuR., Ghose, B., & Tang, S. (2018). Chronic Musculoskeletal Pain, Self-Reported Health and Quality of Life among Older Populations in South Africa and Uganda. International Journal of Environmental and Public Health Research, 15(12):2806 https://doi.org/10.3390/ijerph15122806

Whitehead, D., & Whitehead, L. (2016). Sampling data and data collection in qualitative research. In Z. Schneider, D. Whitehead, G. LoBiondo-Wood, & J. Haber, *Nursing and Midwifery Research 5th Edition* (pp. 111-126). Chatswood: Elsevier.

WHO. (2022, July 14). *Musculoskeletal health*. Retrieved from World Health Organization: https://www.who.int/news-room/fact-sheets/detail/musculoskeletal-conditions

Woolf, A. (2015). Global burden of oseoarthritis and musculoskeletal diseases. *Musculoskeletal Health*, 16(Suppl 1):S3. https://doi.org/10.1186/147-2474-16-S1-S3.

Woolf, C. J. (2011). Central sinsitization: Implications for the diagnosis and treatment of pain. *Pain*, 152(3 Suppl):S2-15. https://doi.org/10.1016/j.pain.2010.09.030.

Wynne-Jones, G., Artus, M., Bishop, A., Lawton, S. A., Lewis, M., Jowett, S., . . . Foster, N. E. (2017). Effectiveness and costs of a vocational advice service to improve work outcomes in patients with musculoskeletal pain in primary care: a cluster randomised trial (SWAP trial ISRCTN 52269669). *PAIN*, https://doi.org/10.1097/j.pain.0000000000001075.

Yeung, E. W., Arewasikporn, A., & Zautra, A. J. (2012). Resilience and Chronic Pain. *Journal of Social and Clinical Psychology*, 31(6):593-617 https://doi.org/10.1521/jscp.2012.31.6.593.

Yu, A., Devine, C. A., Kasdin, R. G., Orizondo, M., Perdomo, W., Davis, A. M., . . . Katz, J. N. (2016). Pain management among Dominican patients with advanced osteoarthritis: a qualitative study. *BMC Musculoskeletal disoders*, 17:211. https://doi.org/10.1186/s12891-016-1075-y.

LIST OF APPENDICES

APPENDIX A1: PARTICIPANT INFORMATION SHEET - ENGLISH

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INFORMATION SHEET

Research Title: The relationship between pain attitudes and beliefs, absenteeism and health-related quality of life of workers with musculoskeletal disorders: a mixed methods study

What is this study about?

This study is being conducted by Brent Petersen, a Masters student at the University of the Western Cape, South Africa. The purpose of this research is to determine your attitudes and beliefs about pain and how it has affected your work and daily life. Understanding how you think about pain and the impact that your painful condition has had in your life could provide valuable information to health care professionals during your treatment. The data acquired from this study will provide health care professionals with more tools to understanding and treating patients presenting with pain due to a musculoskeletal disorder.

Please note that if you have had surgery relating to your painful condition, experienced a stroke, traumatic brain injury or permanent spinal cord injury you are not permitted to participate in this study. You must also be working fulltime or part-time to participate in this study.

What will I be asked to do if I agree to participate?

You will be asked to:

- Complete a self-administered questionnaire regarding your attitudes and beliefs about pain and how it has affected your daily life. The completion of the questionnaire will take approximately 15 minutes.
- Participate in a face-to-face interview at a time and place convenient to you. Participation in the interview is optional but will greatly aid in attaining the objectives of the study. Only a limited number of interviews are required for this study so even if you volunteer you may not necessarily be called to do an interview. The interview will take about 30 to 45 minutes. The information from the recordings will assist the researcher to comprehend what had transpired during the interview.

Will my participation in this study be kept confidential?

Your participation in this study will remain confidential and to ensure this confidentiality, the following measures have been implemented.

- Questionnaires: will not contain any information that will identify you personally as your name will not be included. Only codes known to the researcher will be used for identification purposes. The researcher will be the only one with access to this information. All physical data will be kept in locked box only accessible to the researcher. All electronic data will be kept in a password protected device within password protected folders.
- Face-to-Face Interviews: You will be de-identified from recordings on any devices used during the interview, written notes or related transcription. Only codes will be used to identify you. All recordings will be destroyed once the data has been transcribed and documented. The transcribed data will be stored on password protected devices within password protected folders of which only the researcher will have access to and discard after five years.

If a report or article about this study is published, you will be de-identified, and pseudonyms used to protect the participants' identities when results are published.

What are the risks of this research?

Minimal risks are anticipated in this study. However, all human interactions and talking about one's history and pain experience and the impact it has had can carry some amount of risk. Risks will be reduced through the confidentiality measures that will be implemented and only questions pertinent to achieving the study objectives will be asked during the interviews. If any sensitive issues or questions arise, they will be referred to your attending health care professional.

What are the benefits of this study?

This research is not intended to benefit you personally, but your participation and the results of this study may assist your attending health care professional in understanding your condition. It will also help the researcher to learn more about your attitudes and beliefs regarding pain and the impact it has had in your life. The information you provide may prompt health care professionals in future to address any concerns identified by your answers earlier in the treatment process. Furthermore, this study could be used a background for future research of a similar nature

Do I have to be part of this research and can I withdraw my participation at any time?

You are free to decide on your participation in this study. If you decide to participate, you are free to withdraw from the study at any time and you will not be penalised in anyway

What if I have questions?

This research is being conducted by Brent Petersen, a Masters student in the Physiotherapy Department at the University of the Western Cape. If you have any questions about this research, contact Brent Petersen on 084 404 8240 or email me at 3219668@myuwc.ac.za.

Who to call if you have questions or problems with this study?

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RESEARCH ETHICS NUMBER: BM20_8_20

APPENDIX A2: PARTICIPANT INFORMATION SHEET - AFRIKAANS

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Inligtingsblad

Navorsing Titel : The relationship between pain attitudes and beliefs, absenteeism and health-related quality of life of workers with musculoskeletal disorders: a mixed methods study

Waaroor handel die studie ?

Die studie word gelei deur Brent Petersen, ‘n Meestersgraad student aan die Universiteit van die Wes Kaap, Suid- Afrika. Die doel van die studie is om jou houding en oortuiging rondom pyn te bepaal asook hoe dit jou werk en lewe daagliks beïnvloed het. Om te verstaan hoe jy voel oor pyn en die impak wat dit het op jou daaglikse lewe kan waardevolle inligting aan die professionele gesondheidsorg bied tydens jou behandeling.. Die inligting verkry deur die studie sal professionele gesondheidsorg werkers beter kan toerus in die behandeling van pasiënte met kroniese pyn as gevolg van ‘n muskuloskeletale toestand.

Neem asseblief kennis dat indien jy ‘n operasie ondergaan het wat verband hou met jou kondisie, ‘n beroerte gehad het, traumatiese breinbesering of permanente spinaalkoordbesering opgedoen het, jy nie toegelaat sal word om aan die studie deel te neem nie.

Wat sal van my verwag word indien ek sou instem om aan die studie deel te neem?

Jy sal gevra word om: (die volgende instruksies te voltooi)

- Voltooi ‘n selftoepaslike vraelys oor jou houding en oortuigings rondom pyn en hoe dit jou daaglikse lewe affekteer. Die voltooiing van die vraelys sal ongeveer 15 minute duur. Jy kan ook die vraelys aanlyn voltooi by die volgende skakel:
- Neem deel aan ‘n een-tot-een onderhoud op ‘n tyd en plek wat vir jou gerieflik is. Deelname aan die onderhoud is opsioneel maar sal ‘n groot bydrae lewer om die doelwit van die studie te behaal. Slegs ‘n beperkte aantal onderhoude word benodig vir die studie wat beteken dat jy nie noodwendig gekontak gaan word vir ‘n onderhoud nie al het jy vrywilliglik ingestem. Die onderhoud sal ongeveer 30 tot 45 minute duur. Die inligting van die opnames sal die navorser help om te bepaal wat in die onderhoud bespreek was.

Sal my deelname aan die studie konfidensieel gehou word?

Jou deelname aan die studie sal konfidensieel gehou word en om konfidensialiteit te verseker is die volgende maatreels.geïmplementeer

- Vraelyste: sal geen inligting bevat waarmee jy geïdentifiseer kan word nie aangesien jou naam nie op die vraelys voltooi word nie. Slegs kodes wat net aan die navorser bekend is sal gebruik word vir identifikasie doeleindes. Die navorser sal die enigste persoon wees met toegang tot die inligting. Alle geskrewe data sal in ‘n geslote boks gestoor word waartoe net die navorser toegang sal hê. Alle elektroniese data sal gestoor word in lêers binne ‘n sisteem wat beide deur wagwoorde beskerm sal word.
- Een-tot-een onderhoude: Jou naam sal op geen toestel, notas of transkripsies verskyn nie. Slegs kodes sal gebruik word om jou te identifiseer. Alle opnames sal vernietig word sodra die data verwerk en gedokumenteer is. Alle geskrewe data sal gestoor word in wagwoord beskermde sisteme waartoe slegs die navorser toegang sal hê. Alle data sal na 5 jaar vernietig word.

Indien ‘n verslag of artikel oor die studie gepubliseer word sal alle inligting wat jou kan identifiseer verwyder word. Skuilname sal gebruik word om die identiteit van deelnemers te beskerm wanneer resultate gepubliseer word.

Wat is die risikos verbonde aan die studie?

Minimale risikos word verwag in die studie. Alle menslike interaksies en gesprekke oor die geskiedenis van pyn ervarings en die impak wat dit het, kan ‘n sekere mate van risikos dra. Risikos sal verminder deur die konfidensiële maatreëls wat geïmplementeer sal word. Slegs vrae wat sal bydra tot die bereiking van die studie doelwit sal gedurende die onderhoude gevra word. Indien enige sensitiewe vrae en situasies voorkom sal dit dadelik na die professionele gesondheidsorg werker verwys word.

Wat is die voordele van die studie?

Die navorsing is nie daarop gemik om jou persoonlik te bevoordeel nie, maar om jou kondisie beter te kan verstaan deur jou deelname aan en die resultate van die studie. Dit sal die navorser ook help om meer te leer oor jou houding en oortuigings oor pyn en hoe dit jou daaglikse lewe beïnvloed. Die inligting wat jy verskaf kan professionele gesondheidsorg werkers help om enige bekommernisse wat spruit uit jou antwoorde vir toekomstige gevalle vroeër in die behandelingsproses te identifiseer. Verder kan die studie as agtergrond gebruik word vir verdere navorsing van soortgelyke aard.

Moet ek aan die navorsing deelneem en kan ek my deelname enige tyd onttrek?

Jy is welkom om te besluit of jy aan die studie wil deelneem. Indien jy besluit om deel te neem is jy vry om op enige stadium te onttrek en jy sal nie daarvoor gepenaliseer word nie.

Wat as ek vrae het?

Die navorsing word gelei deur Brent Petersen, ‘n Meestersgraad student in die Fisioterapie department aan die Universiteit van die Wes-Kaap. Indien jy enige navrae oor die studie het, kontak Brent Petersen by 084 404 8240 of per epos na 3219668@myuwc.ac.za.

Wie kan gekontak word vir verdere navrae of probleme met die studie?

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NAVORSINGS ETIEK NOMMER: BM20_8_20

APPENDIX A3: PARTICIPANT INFORMATION SHEET - SISWATI

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LIKHASI LEMNININGWANE

Sihloko Senhlololuvo:

Lumayelana nani Loluhlolo/Lucwaningo?

Loluhlolo lwentiwa ngu Brent Petersen, lowenta ticu temfundvo lephakeme yeMasters enyuvesi yase Nshonalanga Kapa eNingizimu Akrika. Injongo yalolucwaningo ingukutfola indlela lobona ngayo tintfo nalokholelwa kuyo mayelana nebuhlungu nangendlela umsebenti nemphilo yamalanga onkhe itsintseka ngakhona. Ngekuvisisa kutsi ucabangani ngebuhlungu nemtselela lobakhona esimweni sakho, kunganiketa lwati lolubalulekile kubocwepheshe betekunakekela ngetemphilo.ngalesikhatsi welashwa. Imininingwane letawutfolakala kuloluhlolo itawuhlomisa bocwepheshe betekunakekela ngetemphilo ngetinsita letengetekile tekuvisisa nekwelapha tigulane letibonakalisa kuba netinhlungu ngenca yekuphazamiseka kweticubu temtimba, imizwa ematsambo nalapho ahlangana khona.

Caphela kutsi uma uke wahlindvwa ngenca yalobo buhlungu, sifo sekufa luhlangotsi, kulimala ingcondvo noma kulimala umgogodla wangapholi, awunakuvunyelwa kubayincenye yaloluhlolo.

Kufanele ube ucashwe ngalokuphelele noma kwesikhashana kute ube yicenye yaloluhlolo

Ngitawucelwa kutsi ngenteni uma ngivuma kubamba lichaza?

Utawucelwa kutsi u-:

- Cedzele ngekwakho lenhlololuvo mayelana nendlela lobona ngayo nalokholelwa kuko ngebuhlungu, nekutsi kuyitsintse kanjani imphilo yakho yamalanga onkhe. Kucedzela lenhlololuvo kutawutsatsa cishe imizuzu leli-15. Ungakwati nekutsi ulugcwalise ngendlela ye-theknoloji ngekuchumana kulelikheli ----
- Ungatibandzakanya ngekuchumana buso nebuso, uphendvule imibuto yemcwaningi endzaweni nangesikhatsi lesivuna wena. Awukaphoceleleki kubamba lichaza kuloluhlolo ngemibuto, kodvwa kutawusita kakhulu ekufezekiseni tinhloso talo.Kudzingaka inhlololuvo kubantfu labambalwa, ngalokoke nanobe ungalungenela ngekutsandza kwakho, kungenteka ungabutelwa kutsi kuhlanganwe nawe buso nebuso. Uma ungabitwa, lokuhlangana kutawutsatsa imizuzu lengema-30 kuya ku-45. Imininingwane

letawutsetjulwa kulowomhlangano itawisita umcwaningi kutsi akucondze kahle lokutawube kukhulunywe kuleyo-nhlololuvo.

Ingabe kutibandzakanya kwami kuloluphenyo kutawugcinwa kuyimfihlo?

Kutibandzakanya kwakho kuloluhlolo kutawuba yimfihlo, kantsi kute kucinisekiswe loku, sitsetse tinyatselo letilandzelako:

- Inhlololuvo lebhaliwe: - angete ibe nemininingwane letokuchaza wena sicu sakho ngobe libito lakho lingeke livetwe. Kutawubhalwa tinhlavu temagama letitawatiwa ngumhlatiyi kuphela, esikhundleni selibito lakho. Ngumhlatiyi yedvwa lotawuba nalemininingwane yakho. Leyo mininingwane lephatsekako itawukhiyelwa ebhokisini lelitawuvulwa ngumhlatiyi kuphela. Imininingwane leniketwe nge theknoloji, itawufihlwa ngetinhlavu letingukhiye (password) kungcondvomshini lonalobo buciko.
- Inhlolovo yebuso nebuso: - libito lakho angeke litsetjulwe nanome ngayiphi inhlobo yemishini yekutsebula emavi, nangesikhatsi kubhalwa emanothi. Tinhlavu letikhetsekile letitatiwa ngumcwaningi kuphela letitawisetjentiselwa bunikati balengcikitsi letakube ivela kuwe.Konkhe lokutsetjuliwe kutawusulwa uma sekubhalwe phasi kwashicilelwa. Lawomavi latsetjuliwe lesewabhaliwe atawugcinwa kubongcondvomshini, afihlwe kulifayela lelitawuvulwa ngetinhlavu letikhetsekile letitawatiwa ngumcwaningi yedvwa. Kutawugcinwa lapho bese kuyashabalaliswa ngemuva kweminyaka lesihlanu.

Kutawutsi lapho sekwetfulwa lombiko, libito lakho litawuhociswa bese kusetjentiswa lokungesilo mbamba, kute kuvikelwe bonkhe labatibandzakanye naloluhlolo.

Buyini bungoti balolucwaningo?

Buncane kakhulu bungoti lobulindzelekile kuloluhlolo. Nanome kunjalo, konkhe kuchumana kwebantfu netinkhulumo letiphatselene nemlandvo wemuntfu, buhlungu lekandlule kubo nobe lekabuvako, kungaba nebungoti lobutsite. Bungoti butawuncishiswa ngetinyatselo tekuvikela lwati lolutawusetjentiswa, kantsi futsi kutawubutwa leyomibuto lecondzene nekuphumelelisa tinhloso taloluhlolo kuphela. Uma kungavuka imibutonemininingwane leyimfihlo, itawubhekiswa kudokotela wakho.

Tiyini tinzuzo taloluhlolo?

Loluphenyo alukahlosi kuzuzisa wena sicu sakho, kodvwa kutibandzakanya kwakho nemiphumela yakhona ingahle isite dokodela wakho kutsi acondzisise simo sakho. Kutomsita nemcwaningi kutsi afundze kabanti ngesimo sengcondvo nalokholelwa kuko lokuphatselene nebuhlungu kanye nemphumela wako emphilweni yakho. Imininingwane lotayiveta ingahle ikhutsate bocwepheshe betekunakekela ngetemphilo kutsi ngalokutako bakutsatsele enhloko lotawube ukuvetile kutimphendvulo takho. Lokwedlula lapho, loluhlolo lungasetjentiswa njengesisekelo selucwaningo lolufana nalolu, lolungahle lwentiwe ngalokutako.

Ingabe kufanele ngibe yincenye yalolucwaningo, futsi ngingahoca kulo noma ngasiphi sikhatsi na?

Ukhululekile kutikhetsela kutibandzakanya nekungatibandzakanyi kuloluhlolo. Uma ukhetsa kutibandzakanya, ukhululekile kuhoca nome ngabe ngasiphi sikhatsi, futsi angeke ujeziswe nobe ngayiphi indlela.

Uma nginemibuto ke?

Lolucwaningo lwentiwa ngu Brent Petersen lowenta ticu temfundvo lephakeme kulitiko le – Physiotherapy enyuvesi yase Nshonalanga Kapa. Nangabe uba nemibuto mayelana nalolucwaningo, tsintsana naye kuletinombolo 084 404 8240 noma kule e-mail: 3219668@myuwc.ac.za .

Ngubani longatsintfwa nangabe unemibuto nobe tinkinga ngalolucwaningo?

Prof Michael Rowe
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Tel: 021 959 4111
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RESEARCH ETHICS NUMBER: BM20_8_20

APPENDIX B1: CONSENT FORM - ENGLISH

UNIVERSITY OF THE WESTERN CAPE
Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2549 Fax: 27 21-959 1217
E-mail: tsteyl@uwc.ac.za

CONSENT FORM

The study has been described to me in language that I understand. All my questions about the study have been answered. I understand what my participation will involve, and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits.

Participant's name……………………….

Participant's signature……………………………….

Date………………………

If you would like to be part of an interview process in order to gather more detail on your painful condition and how it has affected your daily life, please continue reading and complete below.

- Participation in the interview will involve answering questions relating to the injury and the barriers to your activities of daily living that has developed as a result. I would also like to know how you have or are managing your symptoms.
- I agree to my interview being recorded
- I understand that the report on the results of this research, my identity will remain anonymous. This will be done by disguising the details of any persons discussed in the interview
- I understand that disguised extracts from my interview may be quoted in a thesis, conference presentation and published papers
- I understand that I am entitled to access the information I have provided at any time
- I understand that I am free to contact any persons involved in the research to seek further clarification and information

Contact details

Contact number:.......................................

Email address:..

Questionnaire ID Code: ....

Participant’s signature:..

Date: ……………………

APPENDIX B2: CONSENT FORM - AFRIKAANS

Universiteit van die Wes-Kaapland
Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2549 Fax: 27 21-959 1217
E-mail: tsteyl@uwc.ac.za

TOESTEMMING VORM

Die studie is aan my verduidelik in ‘n taal wat ek verstaan. Al my vrae oor die studie is beantwoord. Ek verstaan wat my deelneme behels en dat ek uit eie keuse en vrywe wil sal deelneem. Ek verstaan dat my identiteit aan niemand bekend gemaak sal word nie. Ek verstaan dat ek enige tyd uit die studie mag onttrek sonder om ‘n rede te verskaf en nie hoef te vrees vir negatiewe nagevolge of verlies van voordele nie.

Deelnemer naam……………………………………

Deelnemer handtekening…………………………

Datum………………………

Indien jy wil deelneem aan ‘n onderhoudsproses om meer inligting in te win oor jou pynvflak en hoe dit jou daaglikse lewe beïnvloed, lees asseblief verder en voltooi die onderstaande.

- Deelname aan die onderhoud sal tot gevolg hê dat jy vrae moet beantwoord oor jou besering en die struikelblokke wat dit tot gevolg gehad het in jou daaglikse aktiwiteite. Hoe het jy en jou simptome behandel en of jy steeds nodig het om jou simptome te behandel
- Ek gee toestemming dat my onderhoud opgeneem mag word
- Ek verstaan dat my identiteit anoniem gehou sal word in die verslag oor die resultate van die navorsing. Dit sal gedoen word deur alle inligting van persone wat in die onderhoud bespreek was te verberg.
- Ek verstaan dat verskuilde uittreksels van my onderhoud aangehaal kan word in ‘n tesis, konferensie aanbiedings asook in publikasies.
- Ek verstaan dat ek enige tyd geregtig is tot toegang van die inligting wat ek verskaf het.
- Ek verstaan dat ek vrylik enige persoon wat betrokke was in die navorsing kan kontak vir verdere inligting of meer duidelikheid.

Kontak Besonderhede

Kontak nommer ....

Epos adress: ....

Vraelys ID kode: ....

Deelnemer handtekening ....

Datum: ………………….

APPENDIX B3: CONSENT FORM – SISWATI

INYUVESI YASE NSHONALANGA KAPA

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959 2549 Fax: 27 21-959 1217
E-mail: tsteyl@uwc.ac.za

LIFOMU LEKUVUMA

Loluhlolo luchazwe kimi ngelulwimi lengiluvisisako. Yonkhe imibuto yami mayelana naloluhlolo iphendvulekile. Ngiyavisisa kutsi kutokwentekani ngekutibandzakanya kwami, kantsi futsi ngivuma ngekutsandza kwani nangekutikhetsela. Ngiyavisisa kutsi imininingwane yami angeke yiniketwe muntfu. Ngiyavisisa kutsi ngingatikhipha kuloluhlolo nobe ngabe kunini ngaphandle kwekuniketa sizatfu nangaphandle kwekusabela imiphumela lengaba mihle noma lengaba mibi.

Ligama lalotsatsa lichaza ……………………….

Singcivito salotsatsa lichaza ………………………………

Lusuku ………………………

Nangabe utsandza kuba yincenye yalenkhulumoluphenyo/inthavyu kute uhlanganiswe imininingwane mayelana nesimo lesibuhlungu nekutsi siyitsintse kanjani imphilo yakho yemihla ngemihla, ngicela uchubeke nekufundza bese ucedzela ngalokulandzelako:

- Kubamba lichaza kulenkhulumoluphenyo kutawudzinga kutsi uphendvule imibuto lemayelana nekulimala kanye nekuvimbeleka kwenta imisebenti yemalanga onkhe lebangelwe nguloko. Ngifuna nekwati kutsi bewu noma uphumelela kanjani kumelana netimphawu taloko.
- Ngivumela kutsi inkhulumoluphenyo itsetjilwe.
- Ngiyavisisa kutsi umbiko wemiphumela yaloluphenyo, kanye nemininingwane ngami iyohlala iyimfihlo. Loku kuyowentiwa ngekutsi kungavetwa imininingwane nganobe ngabe ngubani lekukhulunyiswane naye kuloluphenyo.
- Ngiyavisisa kutsi kungacashunwa kulenkhulumoluphenyo kube kungavetwa kutsi kwashiwo ngubani loko, bese kusetjentiswa emibhalweni, kutetfulo etinkomfeni nekushicilela kumaphephandzaba.
- Ngiyavisisa kutsi nginalo ligunya lekutfola lemininingwane yami nobe kunini.
- Ngiyavisisa kutsi ngikhululekile kuchumana nanobe ngubani lotsintsekako kuloluhlolo, kute ngitfole kucaciseleka kabanti nelwati lengingaludzinga.

Imininingwane yekuchumana:

Tinombolo tekuchumana: ....

Likheli le-imeyli: ....

Ikhodi yebumatisi benhlololuvo: ....

Singcivito salobambe lichaza: ....

Lusuku: ………………

APPENDIX C1: RESEARCH INSTRUMENT - ENGLISH

Questionnaire **ID Code……….**

The purpose of this questionnaire is to understand what you think about your present painful experience and how it has affected your daily life. It contains 3 sections, A, B and C. Please complete the questionnaire in full and if there are any questions or concerns you may ask your attending health care professional or contact the researcher at the details provided. Your participation and contribution will be very helpful in attaining the objectives of this study. If you are currently receiving treatment it will also assist your attending health care professional.

Section A: Demographic Profile (Please ✓tick the appropriate box)

1. **Age of the participant:**

   ☐18–25 years ☐26–30 years ☐31-35 years ☐36-40 year

   ☐41-45 years ☐46-50years ☐51-60years ☐60+ years

2. **Gender of the participant:** ☐Male ☐Female

3. **Marital Status:** ☐Never Married ☐Married ☐Divorced

4. **Residential Area:** ☐Rural ☐Urban

5. **Highest level of education:**

   ☐Grade 7 ☐Matric/Grade 12 ☐Diploma/Degree ☐Post-Graduate

6. **Number of income earners in the household:** ☐1 ☐2 ☐More than 2

7. **Is your painful condition the result of an injury on duty (IOD)?** ☐Yes ☐No

8. **Area of concern**

☐Head/Neck ☐Shoulder ☐Elbow ☐Wrist ☐Hand ☐Upper back ☐Lower back ☐Abdomen ☐Pelvis ☐Hip ☐Thigh

☐Knee

☐Calf ☐Ankle ☐Foot ☐Chest

9. **How many days of work have you missed due to your pain in the last 2 years?**

☐0 days ☐1-2 days ☐3-7 days ☐8-14 days ☐15-30 days

☐1-2 months ☐3-6 months ☐6-12 months ☐over a year

10. **In total how long have you had the painful condition(s)?**

☐0-1 week ☐1-2 weeks ☐3-4 weeks ☐1-2 months

☐3-6 months ☐6-12 months ☐over a year

Section B: EQ-5D-5L (Please ✓tick the most appropriate box)

11. **Mobility**

☐ I have no problems in walking about

☐ I have slight problems in walking about

☐ I have moderate problems in walking about

☐ I have severe problems in walking about

☐ I am unable to walk about

12. **Self-care**

☐ I have no problems washing or dressing myself

☐ I have slight problems washing or dressing myself

☐ I have moderate problems washing or dressing myself

☐ I have severe problems washing or dressing myself

☐ I am unable to wash or dress myself

13. Usual Activities (e.g. work, study, housework, family or leisure activities)

☐ I have no problem doing my usual activities

☐ I have slight problems doing my usual activities

☐ I have moderate problems doing my usual activities

☐ I have severe problems doing my usual activities

☐ I am unable to do my usual activities

14. Pain / Discomfort

☐ I have no pain or discomfort

☐ I have slight pain or discomfort

☐ I have moderate pain or discomfort

☐ I have severe pain or discomfort

☐ I have extreme pain or discomfort

15. Anxiety / Depression

☐ I am not anxious or depressed

☐ I am slightly anxious or depressed

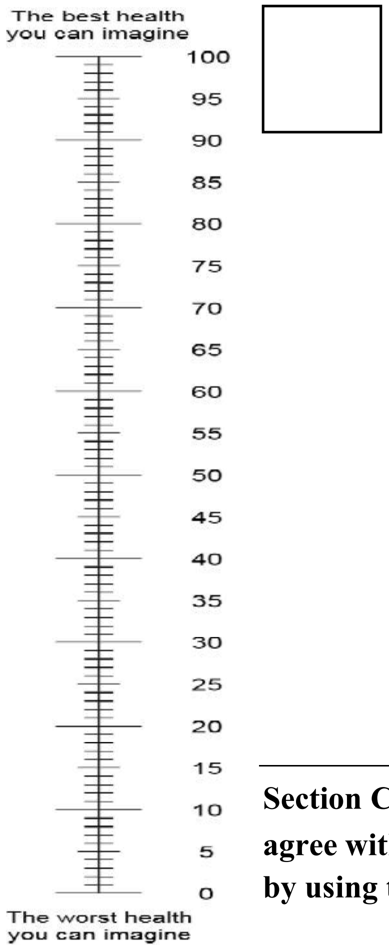
☐ I am moderately anxious or depressed

☐ I am severely anxious or depressed

☐ I am extremely anxious or depressed

16. Health Scale

- We would like to know how good or bad your health is TODAY
- This scale is numbered from 0 to 100
- 100 means the best health you can imagine. 0 means the worst health you can imagine
- Mark and X on the scale to indicate how your health is today.
- Now, please write the number you marked on the scale in the box below.



Section C: SOPA-R: Please indicate (circling O) how much you agree with each of the following statements about your pain problem by using the response key below.

<u>Response Key</u>: 0 = This is very untrue for me.

1 = This is somewhat untrue.

2 = This is neither true nor untrue for me (or it does not apply to me).

3 = This somewhat true for me.

4 = This is very true for me.

1.	The pain I feel is a sign that damage is being done.	0	1	2	3	4
2.	I will probably always have to take pan medications.	0	1	2	3	4
3.	When I hurt, I want my family to treat me better.	0	1	2	3	4
4.	If my pain continues at its present level, I will be unable to work.	0	1	2	3	4
5.	The amount of pain I feel is out of my control.	0	1	2	3	4
6.	I do not expect a medical cure for my pain.	0	1	2	3	4

7.	Pain does not have to mean that my body is being harmed.	0	1	2	3	4
8.	I have had the most relief from pain with the use of medications.	0	1	2	3	4
9.	Anxiety Increases the pain I feel.	0	1	2	3	4
10.	There is little that I can do to ease my pain.	0	1	2	3	4
11.	When I am hurting, I deserve to be treated with care and concern.	0	1	2	3	4
12.	I pay doctors so they will cure me of my pain.	0	1	2	3	4
13.	My pain problem does not need to interfere with my activity level.	0	1	2	3	4
14.	It is the responsibility of my family to help me when I feel pain.	0	1	2	3	4
15.	Stress in my life increases the pain I feel.	0	1	2	3	4
16.	Exercise and movement are good for my pain problem.	0	1	2	3	4
17.	Medicine is one of the best treatments for chronic.	0	1	2	3	4
18.	My family needs to learn how to take better care of me when I am in pain.	0	1	2	3	4
19.	Depression increases the pain I feel.	0	1	2	3	4
20.	If I exercise, I could make my pain problem much worse.	0	1	2	3	4
21.	I can control my pain by changing my thoughts.	0	1	2	3	4
22.	I need more tender loving care than I am now getting when I am in pain.	0	1	2	3	4
23.	I consider myself to be disabled.	0	1	2	3	4
24.	I have learned to control my pain.	0	1	2	3	4
25.	I trust that doctors can cure my pain.	0	1	2	3	4
26.	My pain does not stop me from leading a physically active.	0	1	2	3	4
27.	My physical pain will never be cured.	0	1	2	3	4

28.	There is a strong connection between my emotions and my pain level.	0	1	2	3	4
29.	I am not in control of my pain.	0	1	2	3	4
30.	No matter how I feel emotionally, my pain stays the same.	0	1	2	3	4
31.	When I find the right doctor, he or she will know how to reduce my pain.	0	1	2	3	4
32.	If my doctor prescribed pain medications for me, I would throw them away.	0	1	2	3	4
33.	I will never take pain medications again.	0	1	2	3	4
34.	Exercise can decrease the amount of pain I experience.	0	1	2	3	4
35.	My pain would stop anyone from leading an active life.	0	1	2	3	4

Thank you for completing the questionnaire.

APPENDIX C2: RESEARCH INSTRUMENT - AFRIKAANS

Vraelys **ID Kode……….**

Die doel van hierdie vraelys is om te verstaan wat jy dink van jou huidige pynvlak en hoe dit jou alledaagste lewe beinvloed. Dit bestaan uit 3 afdelings, A, B en C. Voltooi asseblief die vraelys volledig. As daar enige vrae of bekommernisse is aangaande die vraelys mag jy die aanwesige gesondheidssorgwerker vra of die navorser kontak deur die besonderhede verskaf. Jou deelname en bydrae sal baie waardevol wees in die bereiking van die studie doelwitte. Dit sal ook die gesondheidsorgwerker help met die behandeling van jou pynlike kondisie.

Afdeling A: Demografiese Profiel (Merk ✓ asseblief die toepaslike blokkie)

6. **Ouderdom**

☐18-25 jaar ☐25-30 jaar ☐30-35 jaar ☐35-40 jaar

☐40-45 jaar ☐45-50 jaar ☐50-60 jaar ☐60+ jaar

7. **Geslag van die deelnemer:** ☐Manlik ☐Vroulik

8. **Huweliks status** ☐Ongetroud ☐Getroud ☐Geskei

9. **Residensiele Area** ☐Platteland ☐Stedelik ☐Informele nedersetting/ lokasie

10. **Hoogste vlak van onderrig**

☐Graad 7 ☐ Matriek/ Graad 12 ☐Diploma/ Graad ☐ Nagraads

6. **Hoeveelheid werkende persone in die huishouding** ☐1 ☐2 ☐ Meer as 2

16. **Is jou pynlike kondisie as gevolg van 'n besering aan diens?** ☐Ja ☐Nee

17. **Betrokke area/ Area van pyn**

☐Kop/Nek ☐Skouer ☐Elmboog ☐Pols ☐Hand ☐Rug ☐Lae rug

☐ Heup ☐ Bobeen ☐ Knie ☐Kuit ☐ Enkel ☐Voet ☐Bekken

☐Maag ☐Bors

18. Gedurende die afgelope 2 jaar hoeveel werksdae het jy al gemis as gevolg van jou pyn?

☐0 dae ☐1-2 dae ☐3-7 dae ☐8-14 dae ☐15-30 dae

☐1-2 maande ☐3-6 maande ☐6-12 maande ☐meer as 1 jaar

19. Hoe lank in total het jy al die pynlike kondisie(s)?

☐0-1 week ☐1-2 weke ☐3-4 weke ☐1-2 maande ☐ 3-6 maande ☐6-12 maande ☐meer as 1 jaar

Afdeling B: EQ-5D-5L (Merk asseblief die mees toepaslike blokkie)

20. Mobiliteit

☐ Ek het geen probleme met rondloop nie

☐ Ek het effens probleme om rond te loop

☐ Ek het matige probleme om rond te loop

☐ Ek het erge probleme om rond te loop

☐ Ek kan nie rondloop nie

21. Selfsorg

☐ Ek het geen probleme om myself te was of aan te trek nie

☐ Ek het effens probleme om myself te was en aan te trek

☐ Ek het matige probleme om myself te was en aan te trek

☐ Ek het erge probleme om myself te was of aan te trek

☐ Ek kan nie myself was en aantrek nie

22. Alledaagse Aktiwiteite (bv. werk, studies, huiswerk, familie of ontspannings aktiwiteite)

☐ Ek het geen probleme met die uitvoer van my normale aktiwiteite nie

☐ Ek het effens probleme met die uitvoer van my normale aktiwiteite

☐ Ek het matige probleme met die uitvoer van my normale aktiwiteite

☐ Ek het erge probleme met die uitvoer van my normale aktiwiteite

☐ Ek kan nie my normale aktiwiteite uitvoer nie

23. Pyn / Ongemak

☐ Ek het geen pyn of ongemak nie

☐ Ek het effens pyn en ongemak

☐ Ek het matige pyn en ongemak

☐ Ek het erge pyn en ongemak

☐ Ek het baie erge pyn en ongemak

24. Angs/ Depressie

☐ Ek is nie angstig of depressief nie

☐ Ek is effens angstig en depressief

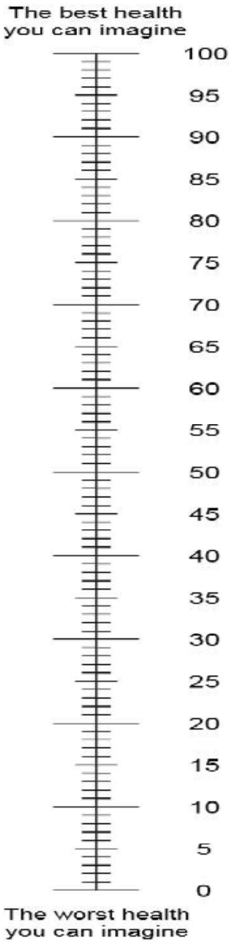
☐ Ek is matig anstig en depressief

☐ Ek is baie angstig en depressief

☐ Ek is uiters angstig en depressief

16. Gesondheids skaal

- Ons wil weet hoe goed of sleg jou gesondheid VANDAG is
- Hierdie skaal is genommer van 0 tot 100
- 100 beteken die beste gesondheid wat jy jouself kan indink. 0 beteken die slegste gesondheid wat jy jouslef kan indink.
- Merk ‘n X op die skaal om aan te dui hoe jou gesondheid vandag is
- Skryf daarna asseblief die nommer wat jy op die skaal gemerk het in die blokkie onderaan.



Afdeling C: SOPA-R Dui asseblief aan (sirkel O) tot watter mate jy met elkeen van die volgende stellings saamstem aangaande jou huidige pyn. Gebruik die sleutel onderaan

Sleutel 0 = Dit is baie onwaar vir my

1 = Dit is ietwat onwaar vir my

2 = Dit is nie waar of onwaar vir my nie(of dit is nie van toepassing op my nie)

3 = Dit is ietwat waar vir my

4 = Dit is baie waar vir my

1.	Die pyn wat ek voel is ‘n teken van skade wat aangerig word	0	1	2	3	4
2.	Ek gaan seker altyd pyn medikasie moet gebruik	0	1	2	3	4
3.	Wanneer ek seer het wil ek hê my familie moet my beter hanteer	0	1	2	3	4
4.	As my pyn aanhou soos wat dit huidiglik is sal ek nie kan werk nie	0	1	2	3	4
5.	Die hoeveelheid pyn wat ek ervaar is buite my beheer	0	1	2	3	4
6.	Ek verwag nie ‘n mediese oplossing vir my pyn nie	0	1	2	3	4
7.	Pyn hoef nie te beteken dat my liggaam beskadig/beseer word nie	0	1	2	3	4
8.	Ek kry die meeste pyn verligting met die gebruik van pyn medikasie	0	1	2	3	4
9.	Angs vererger my pynvlak	0	1	2	3	4
10.	Daar is min wat ek kan doen om my pyn te verlig	0	1	2	3	4
11.	Wanneer ek seer het verdien ek om met sorg en simpatie behandel te word	0	1	2	3	4
12.	Ek betaal dokters om my te genees van my pyn	0	1	2	3	4
13.	My pyn hoef nie met my aktiwiteits vlakke in te meng nie	0	1	2	3	4

14.	Dit is die verantwoordelikheid van my familie om my te help wanneer ek pyn ervaar	0	1	2	3	4
15.	Spanning verhoog my pynvlak	0	1	2	3	4
16.	Oefening en beweging is goed vir my pyn	0	1	2	3	4
17.	Medikasie is een van die beste behandelings vir kroniese pyn	0	1	2	3	4
18.	My familie moet leer hoe om beter na my om te sien wanneer ek in pyn is.	0	1	2	3	4
19.	Depressie vererger die pyn wat ek voel	0	1	2	3	4
20.	As ek oefen kan ek my pyn vererger	0	1	2	3	4
21.	Ek kan my pyn beheer deur my gedagtes te verander	0	1	2	3	4
22.	Ek het meer meer liefdevolle sorg nodig as wat ek huidiglik kry wanneer ek pyn het.	0	1	2	3	4
23.	Ek beskou myself as gestremd	0	1	2	3	4
24.	Ek het geleer hoe om my pyn te beheer	0	1	2	3	4
25.	Ek vertrou dat dokters my pyn kan genees	0	1	2	3	4
26.	My pyn verhoed my nie om 'n fisiese aktiewe lewenstyl te volg nie	0	1	2	3	4
27.	My fisiese pyn sal nooit genees word nie	0	1	2	3	4
28.	Daar is 'n sterk verband tussen my emosies en my pyn	0	1	2	3	4
29.	Ek is nie in beheer van my pyn nie	0	1	2	3	4
30.	My pyn bly dieselfde ongeag my emosionele toestand.	0	1	2	3	4
31.	Wanneer ek die regte dokter kry sal hy of sy weet hoe om my pyn te verminder	0	1	2	3	4
32.	As my dokter vir my pyn medikasie voorskryf sal ek dit weggooi	0	1	2	3	4

33.	Ek sal nooit weer pyn medikasie gebruik nie.	0	1	2	3	4
34.	Oefening kan die hoeveelheid pyn wat ek ervaar verminder	0	1	2	3	4
35.	My pynvlak sal enige iemand stop om ‘n aktiewe lewe te hê.	0	1	2	3	4

Dankie dat jy die vraelys voltooi het

APPENDIX C3: RESEARCH INSTRUMENT - SISWATI

Inhlololuvo. Ikhodi yebumatisi: ……….

Inhloso yalenhlololuvo kucondzisisa kutsi ucabangani ngesimo lesibuhlungu, lewukuso manje nekutsi siyitsintsa kanjani imphilo yakho yamalanga onkhe. Inetigaba letintsatfu A, B, na C. Uyacelwa kutsi ugcwalise lenhlololuvo ngalokuphelele, uma unemibuto noma ungacondzisisi kahle ungabuta kudokotela wakho noma uchumane nemcwaningi kuletindlela tekuchumana naye letiniketiwe. Kuhlanganyela kwakho nekufaka sandla kutawusita kuphumelelisa tinjongo taloluphenyo. Kutawuphindze kusite ekwelapheni simo setinhlungu lekabhekane naso dokotela wakh.

Sigaba A: Imininingwane ngetibalobalo nesimonhlalo (Uyacelwa kutsi ukhombise nge – (thik ✓) ebhokisini lekungilo)

11. Budzala balobamba lichaza:

☐18–25 iminyaka ☐25–30 iminyaka ☐30-35 iminyaka ☐35-40 iminyaka

☐40-45 iminyaka ☐45-50 iminyaka ☐50-60 iminyaka ☐60+ iminyaka

12. **Bulili balobamba lichaza:** ☐Mdvuna ☐Msikati

13. **Simo semshado:** ☐Angikashadi ☐Ngishadile ☐Sehlukene

14. **Uhlalaphi:** ☐Emakhaya ☐Edolobheni ☐Elokishini

15. Lizinga leliphakeme lemfundvo:

☐Libanga ☐Matekuletjeni / Libanga ☐Imfundvo lephakeme

☐Ngenhla kwemfundvo lephakeme

6. Bangaki labemukela liholo ekhaya: ☐1 ☐2 ☐Ngenhla kwa

25. Ingabe buhlungu lobuvako bubangelwe kulimala emsebentini? ☐Yebo ☐Cha

26. Indzawo lekukhatsatako

☐Inhloko/Intsamo ☐Siphanga ☐Ingcoza ☐Sihlakala ☐Sandla ☐Ngenhla kwemhlane ☐Entasi kwemhlane ☐Licolo ☐Ingculu ☐Lidvolo ☐Sitfo ☐Licakala ☐Lunyawo ☐Sitfo semtimba lesingentasi ☐Sitfo semtimba lesisemkhatsini ☐Sifuba

27. Mangaki emalanga longapumelelanga kuya emsebentini ngawo ngenca yetinhlungu eminyakeni lemibili leyengcile?

☐0 malanga ☐1-2 malanga ☐3-7 malanga ☐8-14 malanga ☐15-30 malanga

☐1-2 tinyanga ☐3-6 tinyanga ☐6-12 tinyanga ☐ngetulu kwemnyaka

28. Ngalokuphelele sekusikhatsi lesingakanani ukulesimo setinhlungu?

☐0-1 liviki ☐1-2 emaviki ☐3-4 emaviki ☐1-2 tinyanga ☐3-6 tinyanga ☐6-12 tinyanga ☐ngenhla kwemnyaka

Sigaba B: EQ-5D-5L (Uyacelwa kutsi ukhombise nge – (thik ✓) ebhokisini lekungilo)

29. Kunyakata

☐ Anginatinkinga uma ngihambahamba

☐ Nginaletincane tinkinga uma ngihambahamba.

☐ Nginetinkinga letiphakatsi nendzawo uma ngihambahamba

☐ Nginetinkinga letimatima uma ngihambahamba

☐ Ngiyahluleka kuhambahamba

30. Kutinakekela

☐ Anginatinkinga tekutigezisa nekutigcokisa

☐ Nginaletincane tinkinga tekutigezisa nekutigcokisa

☐ Nginetinkinga letiphakatsi nendzawo tekutigezisa nekutigcokisa

☐ Nginetinkinga letimatima tekutigezisa nekutigcokisa

☐ Ngiyehluleka kutigezisa nekutigcokisa

31. Imisebenti leyetayelekile, (e.g.kusebenta, kufundza, umsebenti wasekhaya, umndeni noma tekukhibika)

☐ Anginankinga uma ngenta imisebenti yami leyetayelekile

☐ Nginenkinga lencane uma ngenta imisebenti yami leyetayelekile

☐ Nginnnkinga lephakatsi nendzawo uma ngenta imisebenti yami leyetayelekile

☐ Nginetinkinga letimatima uma ngenta imisebenti yami leyetayelekile

☐ Ngiyehluleka kwenta imisebenti yami leyetayelekile

32. Buhlungu/Kungativa kahle

☐ Anginabuhlungu noma kungativa kahle

☐ Nginalobuncane buhlungu noma kungativa kahle

☐ Nginalobusekhatsi nendzawo buhlungu noma kungativa kahle

☐ Nginalubumatima buhlungu noma kungativa kahle

☐ Nginalobudlulele buhlungu noma kungativa kahle

33. Kukhatsateka /Kucindzeteleka

☐ Angikakhatsateki noma kucindzeteleka

☐ Ngikhatsateke nekucindzeteleka kancane

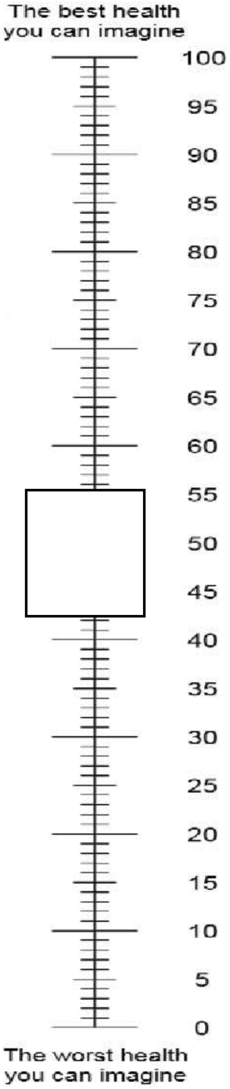
☐ Ngikhatsateke nekucindzeteleka ngalokusekhatsi nendzawo

☐ Ngikhatsateke nekucindzeteleka kakhulu.

☐ Ngikhatsateke nekucindzeteleka ngalokwedlulele

16. Silinganiso setemphilo

- Sifuna kwati kutsi yikahle noma yimbi kangakanani imphilo yakho namuhla.
- Lesilinganiso sinetinombolo letisukela ku 0 kuya ku 100
- 100 lisho imphilo lenhle. 0 asho imphilo lembhi longayicabanga.
- Bhala X kulesilinganiso kute ukhombise kutsi injani imphilo yakho namuhla.
- Manje sicela ubhale lenombolo loyikhetse kulesilinganiso ebhokisini lelingentasi.



Sigaba C: SOPA-R: Sicela ubonise ngeku (biyela O) kutsi uvumelana kangakanani naletitatimende letilandzelako, mayelana yetinhlungu takho ngekusebentisa indlela yekuphendvula lengentasi.

Indlela yekuphendvula 0 = Loku akusilo liciniso ngami.

1 = Loku kucishe kungabi liciniso ngami.

2 = Loku akusilo liciniso nobe emanga ngami.

3 = Loku kicishe kube liciniso ngami.

4 = Loku kuliciniso mbamba ngami.

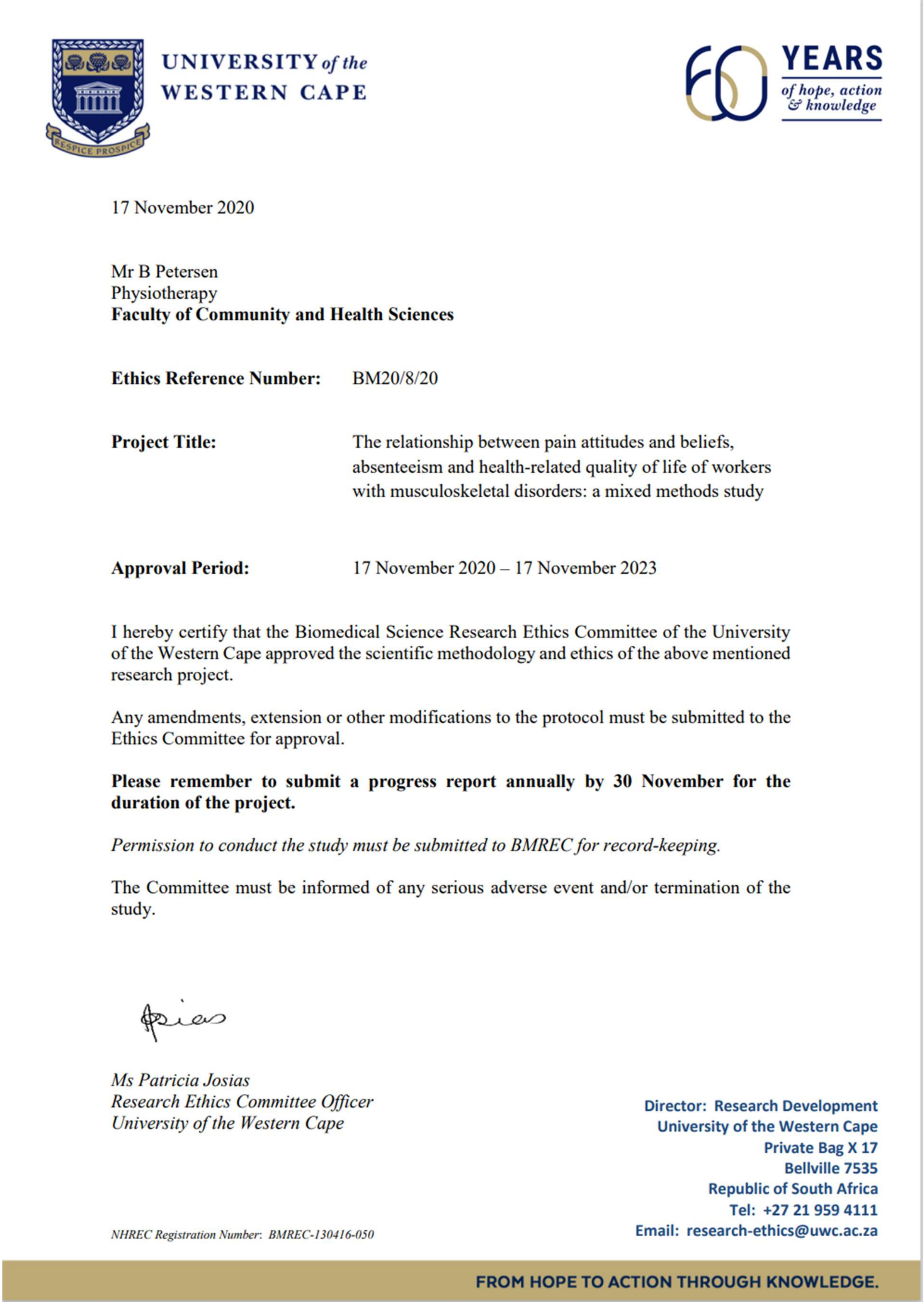
1.	Buhlungu lengibuvako buyinkomba yekutsi kunemonakalo lowentekako.	0	1	2	3	4
2.	Kungahle kudzingeke kutsi nginatse umutsi wetinhlungu.	0	1	2	3	4
3.	Uma nguva buhlungu ngidzinga kutsi umndeni wami ungiphatse kahle.	0	1	2	3	4
4.	Uma buhlungu buchubeka ngalelizinga, angeke ngikhone kusebenta.	0	1	2	3	4
5.	Lelizinga lebuhlungu lengibuvako lingenhla kwemandla ami.	0	1	2	3	4
6.	Angikalindzeli kwelapheka ngemutsi kuletinhlungu.	0	1	2	3	4
7.	Buhlungu abukafeneli kutsi busho kutsi umtimba wami uyalimala.	0	1	2	3	4
8.	Ngitfole kukhululeka lokukhulu etinhlungwini ngekusebentisa umutsi.	0	1	2	3	4
9.	Kukhatsateka kwengeta buhlungu lengibuvako.	0	1	2	3	4
10.	Kuncane lengingakwenta lokungadzambisa lobuhlungu.	0	1	2	3	4
11.	Uma ngiva buhlungu ngidzinga kunakekelwa ngesineke.	0	1	2	3	4
12.	Ngiyabakhokhela bodokotela kute bangelaphe kulobuhlungu.	0	1	2	3	4

13.	Inkinga yetinhlungu lenginayo akukafaneli kutsi iphazamise lizinga leminyakato yami.	0	1	2	3	4
14.	Kusemahlombe emndeni wami kutsi bangisite uma ngiva buhlungu.	0	1	2	3	4
15.	Kucindzeteleka emoyeni kwengeta buhlungu lengibuvako.	0	1	2	3	4
16.	Kutivocavoca nekunyakanyakata kuyangisita kulenkinga yetinhlungu.	0	1	2	3	4
17.	Umutsi ungulokunye lukolungele kwelapha tifo letingelapheki.	0	1	2	3	4
18.	Umndeni wami udzinga kufundziswa kutsi unganginakekela kanjani uma ngisetinhlungwini.	0	1	2	3	4
19.	Kucindzeteleka emoyeni kwengeta tinhlungu lengitivako.	0	1	2	3	4
20.	Uma ngingativocavoca, ngingahle ngente simo setinhlungu sibe simbi kakhulu.	0	1	2	3	4
21.	Ngingalawula simo setinhlungu ngekugucula indlela lengicabanga ngayo	0	1	2	3	4
22.	Uma ngiva buhlungu ngidzinga kunakekelwa ngelutsandvo nesineke lesikhulu.	0	1	2	3	4
23.	Ngititsatsa njengemuntfu lokhubatekile.	0	1	2	3	4
24.	Sengifundzile kulawula tinhlungu tami.	0	1	2	3	4
25.	Ngiyatsemba kutsi bodokotela bangangelapha.	0	1	2	3	4
26.	Buhlungu lengibuvako abungivimbi kutsi ngiphile imphilo yekutivocavoca	0	1	2	3	4
27.	Buhlungu lengibuvako emtimbeni wami angeke bulapheke.	0	1	2	3	4
28.	Kunekuchumana lokucinile imphela emkhatsini wekuphakama kwemoya nelizinga letinhlungu lengitivako.	0	1	2	3	4
29.	Angeke ngibulawule buhlungu lengibuvako.	0	1	2	3	4

30.	Nanome ngabe ngitiva kanjani emoyeni, buhlungu abugucuki.	0	1	2	3	4
31.	Uma ngingatfola dokotela longuye, utawukwati kwehlisa buhlungu lengibuvako.	0	1	2	3	4
32.	Uma dokotela wami anganginiketa umutsi wetinhlungu, ngingawulahla.	0	1	2	3	4
33.	Ngeke ngiphindze nginatse umutsi wetinhlungu.	0	1	2	3	4
34.	Kutivocavoca kungalehlisa lizinga lebuhlungu lengibuvako.	0	1	2	3	4
35.	Buhlungu lengibuvako bungavimbela nome ngabe ngubani kutsi akwati kuphila imphilo leyetayelekile	0	1	2	3	4

Ngiyabonga kutsi ugcwalise lenhlololuvo.

APPENDIX D: UWC BMREC ETHICS APPROVAL



UNIVERSITY of the
WESTERN CAPE

RESPICE PROSPICE

60 YEARS
of hope, action
& knowledge

17 November 2020

Mr B Petersen
Physiotherapy
Faculty of Community and Health Sciences

Ethics Reference Number: BM20/8/20

Project Title: The relationship between pain attitudes and beliefs, absenteeism and health-related quality of life of workers with musculoskeletal disorders: a mixed methods study

Approval Period: 17 November 2020 – 17 November 2023

I hereby certify that the Biomedical Science Research Ethics Committee of the University of the Western Cape approved the scientific methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report annually by 30 November for the duration of the project.

Permission to conduct the study must be submitted to BMREC for record-keeping.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Director: Research Development
University of the Western Cape
Private Bag X 17
Bellville 7535
Republic of South Africa
Tel: +27 21 959 4111
Email: research-ethics@uwc.ac.za

NHREC Registration Number: BMREC-130416-050

FROM HOPE TO ACTION THROUGH KNOWLEDGE.

APPENDIX E: FACE-TO-FACE INTERVIEW GUIDE

FACE-TO-FACE INTERVIEW GUIDE

Introduction

Hello, my name is **Brent Petersen.** Thank you for completing the questionnaire of this study and volunteering to participate in the interview phase. As a reminder this study is about attitudes and beliefs about pain and your pain experience is affecting your ability to work and daily life. Based on the answers you provide to the questionnaire I needed more information on the background behind them which will assist in attaining the objectives of this study. Due to the ongoing COVID-19 pandemic we must adhere to the following precautions during the interview: Masks must always be worn and physical distancing of 1.5m must be maintained.

Preamble

In the course of the interview do not use your real name or names of any other people who may be significant in your answers to the questions. I must remind you again that this interview will be recorded and transcribed and once it has been done so you will be de-identified from the transcription and the recording deleted. Please try to be as detailed as possible with your answers as they may help all health care professionals provide better care to their patients in future. I may ask follow-up questions to your answers where appropriate in order to gather clarity.

Do you have any questions before we start? With your permission, I would like to start recording and begin the interview.

1. What is your painful condition and how did it start?
2. What do you understand about your painful condition?
3. What have you done to manage this problem on your own?
4. Has your daily activities changed in any way (home, work, leisure)?
5. How has your employer responded to your injury?
6. What have all the health care professionals you have seen said about your painful condition (diagnosis/prognosis)?
7. What response have you received from your family regarding your painful condition?
8. Anything else you would like me to know about your painful condition?

Thank you for participating in the interview.

APPENDIX F: RESEARCH FREQUENTLY ASKED QUESTIONS

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Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2549 Fax: +27 21-959 1217
E-mail: tsteyl@uwc.ac.za

Frequently Asked Questions

Title: The relationship between pain attitudes and beliefs, absenteeism and health-related quality of life of workers with musculoskeletal disorders: a mixed methods study

What is this study about?

This study is being conducted by Brent Petersen, a Masters student at the University of the Western Cape, South Africa. The purpose of this research is to determine the attitudes and beliefs about pain and how it has affected your patients' ability to work and their daily life. By understanding how your patients think about pain and the impact that your painful condition has had on their life it could provide valuable information that may assist during your treatment. You are free to access the results of the questionnaire that your patients have answered but it is meant to be treated with the utmost confidentiality. Also note that this study involves and quantitative and qualitative phase.

Who can participate?

Any individual aged 18-65 years who is working fulltime or part-time and is currently experiencing a musculoskeletal disorder. Those who have received surgery that was intended to treat the main concern in the last 2 years or presents/had a neurological disorder (TBI, CVA, SCI) are excluded from participation.

What is considered absent from work/ time off from work/ workdays missed?

Any amount of time the participant has spent at home or not working on a day where they would normally be working as a result of their main concern. This includes if the participant decided to use the 'sick leave' days given by their doctor. If their main concern was part of the motivation to suddenly take annual leave it will be considered as workdays missed. Planned annual leave, family days, maternity leave are not considered as workdays missed.

Completing the questionnaire

All documents are available in English, Afrikaans and Siswati and the participant can choose their preferred language. To avoid leading the participant do not offer to dictate the questionnaire if they do not understand it in the available languages, they will just be excluded from the study. All 3 documents (Information sheet, consent form and Research

Instrument) must be given to the participant and both the consent form and completed questionnaire must be returned. The participant can keep the information sheet

Research Instrument

Section A consists of demographic information

Section B consists of the EQ-5D-5L which is a 5 item quality of life questionnaire that provides scores for different health related dimensions and an index value to assess health status.

Section C consists of the Survey of Pain Attitudes-revised (SOPA-R). It is a 35 item scale that assesses adaptive and maladaptive behaviours with regards to pain. It consists of seven domains namely, control, disability, harm, emotion, medication, solicitude and medical cure. The score is measured individually across each domain as a range within normal, sub-clinical or clinical. Please see below for the scoresheet of the SOPA-R

Domain	**Score */20**	**Percentage of score**	**Clinical Range maladaptive beliefs** (**<=50%** = normal, **>=50%** = sub clinical, **>=80%** = clinical)
Control (5,*10,21,24,*29)	/20		
Emotion (9,15,19,28,*30)	/20		
Disability (4,13,*23,26,*35)	/20		
Harm (1,7,*16,*20,*34)	/20		
Medication (2,8,17,32,*33)	/20		
Solicitude (3,11,14,18,22)	/20		
Medical Cure (6,*12,25,27, *31)	/20		

Domains in **bold** are adaptive beliefs and the rest are maladaptive beliefs. Adaptive belief clinical ranges are **>=50**% = normal, **<50%** = subclinical, **<=25%** = clinical

* = reverse scored items (4 – rating given) before adding to total and then sum all ratings for each domain

Outliers

Do not be concerned with participants who are unable to complete the questionnaire fully or express difficulty in completing it although I will appreciate it if an estimate number of these participants are recorded

Data Collection

All documents will be available in English, Afrikaans, and SiSwati. Completed questionnaires during the quantitative phase will be collected once a month and replaced with new copies. Please contact me if you run out of copies earlier than the scheduled collection date. Where possible and depending on what is convenient for your patients the interviews may need to occur on your premises. In such a case a prior arrangement will be made with you to ensure business operations are not interrupted.

Right to withdraw

Participation is voluntary and you may withdraw your practice from participating in the study at any time.

What if I have more questions?

This research is being conducted by Brent Petersen, a Masters student in the Physiotherapy Department at the University of the Western Cape. If you have any questions about this research, contact Brent Petersen on 084 404 8240 or email me at 3219668@myuwc.ac.za. If there questions related to the research study please contact the study supervisors, Dr Tania Steyl at tsteyl@uwc.ac.za and Prof. Julie Philips at jphilips@uwc.ac.za .

APPENDIX G: AUTHORISATION DATA COLLECTION SITES

UNIVERSITY OF THE WESTERN CAPE
Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2549 Fax: +27 21-959 1217
E-mail: tsteyl@uwc.ac.za

AUTHORISATION FOR DATA COLLECTION

Title: The effect of pain attitudes and beliefs of workers with musculoskeletal disorders on absenteeism and health-related quality of life: a mixed methods study

What is this study about?

This study is being conducted by Brent Petersen, a Masters student at the University of the Western Cape, South Africa. The purpose of this research is to determine the attitudes and beliefs about pain and how it has affected your patients' ability to work and their daily life. By understanding how your patients think about pain and the impact that your painful condition has had on their life it could provide valuable information that may assist during your treatment. You are free to access the results of the questionnaire that your patients have answered but it is meant to be treated with the utmost confidentiality. Also note that this study involves and quantitative and qualitative phase.

Research Instrument

The hardcopies of the information sheets, consent forms and questionnaires will be provided. The questionnaire also serves as a screening tool for psychosocial barriers to recovery from injury. It is also left to your own clinical judgment which patients should complete the questionnaire. It is also indicated on the patient information sheet who is and is not allowed to participate in the study. There will also be link to the online version of the questionnaire which will be indicated on the information sheet should your patients wish to complete it in their own time. Results from the online survey will also be made available to your practice via email on a weekly basis.

Research inclusions and exclusions

This study is intended to be completed by patients who are working fulltime or part-time only and currently being experiencing a neuromusculoskeletal disorder. Patients who have had surgery relating to their condition within the last 2 years or presenting with a neurological disorder (CVA, TBI, spinal cord injury) are excluded from participating in this study.

Data Collection

All documents will be available in English, Afrikaans, and SiSwati. Completed questionnaires during the quantitative phase will be collected twice a month and replaced with new copies. Where possible and depending on what is convenient for your patients the interviews may need to occur on your premises. In such a case a prior arrangement will be made with you to ensure business operations are not interrupted.

Right to withdraw

Participation is voluntary and you may withdraw your practice from participating in the study at any time.

What if I have questions?

This research is being conducted by Brent Petersen, a Masters student in the Physiotherapy Department at the University of the Western Cape. If you have any questions about this research, contact Brent Petersen on 084 404 8240 or email me at 3219668@myuwc.ac.za, or the study supervisors, Dr Tania Steyl at tsteyl@uwc.ac.za and Prof. Julie Philips at jphilips@uwc.ac.za .

Practice owner's name Click or tap here to enter text.

Practice contact number Click or tap here to enter text.

Practice email address Click or tap here to enter text.

Practice owner's signature

Date Click or tap to enter a date.

APPENDIX H: TRANSCRIPTION INSTRUCTIONS

UNIVERSITY OF THE WESTERN CAPE
Private Bag X 17, Bellville 7535, South Africa
Tel: +27 21-959 2549 Fax: +27 21-959 1217
E-mail: tsteyl@uwc.ac.za

TRANSCRIPTION INSTRUCTIONS

Title: The relationship between pain attitudes and beliefs, absenteeism and health-related quality of life of workers with musculoskeletal disorders: a mixed methods study.

Thank you again for assisting with the transcription of the interviews for my Masters project. This is a critical segment of the study and essential to completing the data analysis. The transcription will greatly assist in answering the research questions and achieving its objectives. I have included the research questions and objectives below to assist you understanding the context of the interviews. I have also provided you with a copy of my field notes which will provide you with a background as to what was discussed in each interview. Please familiarise yourself with aims and objectives of the study before continuing with the rest of the instructions.

Research Questions

- What is the relationship between pain attitudes and beliefs, absenteeism and health-related quality of life of workers with musculoskeletal disorders?
- What are the experiences of workers who are trying to manage pain attributable to musculoskeletal disorders?

Aim of the study

To investigate the relationship between pain attitudes and beliefs, absenteeism and health-related quality of life workers with musculoskeletal disorders and their experiences in managing their pain.

Specific Objectives of the study

To determine:

- the ***pain attitudes and beliefs*** of workers with musculoskeletal disorders
- the ***days absent from work*** of workers with musculoskeletal disorders
- the ***health-related quality of life (HRQoL)*** of workers experiencing pain attributable to musculoskeletal disorders

- the ***relationship between pain attitudes and beliefs and absenteeism from work*** of workers with pain attributable to MSDs
- the ***relationship between pain attitudes and beliefs and quality of life*** of workers with pain attributable to musculoskeletal disorders.
- To explore workers' experiences in the management of pain attributable to musculoskeletal disorders pain.

Transcription Requirements

- All recordings must be described verbatim which means that all utterances/interjections and pauses must be recorded in written text
- Please listen to each recording at least twice before you start with the transcription, this will give you a better understanding of the language/accent to enhance the transcription accuracy
- This is a naturalised transcription which is defined as transcribing audio data in the spoken language (includes slang or culturally appropriate words) while correcting spelling as far as possible without correcting grammar.
- A code book has been provided which assist with the transcription process, please familiarize yourself with it.
- Punctuation is important but must not supersede the code book.
- The transcription will follow a linear format as below:

I: Tell me about your pain experience and how it started?
E1: I had an injury a few months ago

I = Interviewer
E1 = code relating to the participant
My speech should remain in **bold**, but all text should be typed in Font Size 12, Font Type: Times New Roman. There are 8 questions/specific lines of inquiry and there should only be a space once a line of enquiry ends and the next one begins. At the end of each line of inquiry please include the time on the recording. You will hear in the recordings that I do ask those specific questions which will indicate a new line of inquiry.

- Each transcription should start and end as follows but it will be included in the template

- START OF THE INTERVIEW -
Transcription text
- END OF THE INTERVIEW –

Transcription code book

When in the recording	**In the transcription**	**Example**
You cannot hear what the person is saying	Information inside of parentheses	(Inaudible text segment)
You cannot understand what the person is saying	Information inside of parentheses	I tried to tell him! He would (unintelligible segment) then I just left.
You are unsure about what the person is saying	Inside parenthesis and delimited by question marks	It was not getting better at the time. I tried different ?(strategies)? but nothing worked.
You cannot understand because of cross talk	That piece of information inside parentheses. After that write what you think you heard and highlight in red and use sequential format	(Unintelligible segment due to overlapping speech/cross-talk) **I: What hap-**A1: I felt I was not getting the attention I ne- **I: How did you speak to them?**
A cross-talk begins	Open square bracket. Sequential format must be followed	[
A cross-talk ends	Closed square bracket. Sequential format must be followed	]
If you believe that the interviewee mispronounced a word	The exact transcription of what was said and a proposal inside parenthesis delimited by forward slashes	Orthopidic /(Orthopaedic)/
Interruption/word is cut	Hyphen at the end	Through-
To include notes/ explain interruptions	Text in italic inside parentheses. This is to explain interruptions that was not the interviewer or participants fault	(*Person accidentally walked into the room while the interview was in progress*)

Non-verbal sounds (e.g., emotions)	Information inside parentheses	(laughed/giggled); (sighed)
Silences/pauses	Three ellipses inside parentheses	(…)
The person emphasises speech	These words should be written in UPPERCASE and <u>underlined</u>	A1: It gave me <u>SEVERE</u> migraines each time I though about it.
Speech uttered in a quicker pace than the surrounding speech	Word/words should appear like this >word<	I just >needed someone to help me< until I am healed.
Speech uttered in a slower pace than the surrounding speech	Word/words should appear like this <word>	It happened <over a very long time>
Interjections	These designations are examples:	Hmm Mm Ah Umm
Audible/exaggerated inhalation that occurs anywhere in a segment	.hhh	
Audible/exaggerated exhalation that occurs anywhere in a segment	hhh	
Comments from the transcriptionist	These are your comments on something that occurs in the moment, before a segment or after a segment. Double parentheses must be used.	**I: How did this affect your daily activities such as work, home, recreation?** A1: Pardon? ((Some confusion between the **Interviewer** and A1))

If there is anything you come across in the recordings that is not covered by the code book you may contact me for clarity or update the code book with your own codes.