A psychosocial profile of patients presenting with non-specific neck pain to a Chiropractic Day Clinic at a University of Technology

By

Karishma Nana

Dissertation submitted in partial compliance with the requirements for the Master's Degree in Technology: Chiropractic

Durban University of Technology

I, Karishma Nana, do hereby declare that this dissertation is representative of my own work in both conception and execution (except where acknowledgements indicate to the contrary).

……..… Date: ……..

Karishma Nana

Approved for Examination by:

……..… Date: ……..

Dr P. Z. Twala (Supervisor)

M. Tech: Chiropractic

……..… Date: ……..

Mrs K. Young

M. Ed Counselling

DEDICATION

This is dedicated to my mum and role model, Veena Dayaljee.

ACKNOWLEDGEMENTS

It is with sincere gratitude and appreciation that I would like to acknowledge and thank the following people:

The Durban University of Technology Chiropractic Day Clinic for allowing me the use of the facility to conduct my research on the premises.

My supervisors, Dr P. Z. Twala and Mrs K. Young: thank you for your assistance and guidance throughout this research process.

To my statistician, Mr M. Jamal for going out of his way to assist me and get my stats done before my deadlines and my proof reader Elize for all your assistance as well and for formatting my document.

My mum, thank you for all you have done for me, from the emotional support all the way to the financial support. Thank you for always believing in me and supporting me in everything that I do. I truly love you more than words can express.

To Krisha, thank you for being patient with me and for picking up the slack when I was preoccupied with my studies. I really do appreciate it all. Thank you for believing in me always.

To Vishal, for always being a role model to me even when I was growing up. Your thirst for knowledge always inspired me throughout life growing up in your presence.

To Bhavna and Janice, for going through this process with me and motivating me to keep going even when times were tough.

To Rochelle for being a supportive and encouraging friend through this process.

Thank you to the reception staff, Linda, Mrs B and Jo for their assistance throughout my data collection process and for being patient with me.

Finally thank you to all my friends and family for their assistance and support throughout my journey through chiro and for always standing by me.

ABSTRACT

BACKGROUND: According to the World Federation of Chiropractic (2009), neck pain (NP) is a common problem responsible for disability. When treating a NP patient, it was important to identify those at risk of developing chronic NP. NP is of multifactorial origin and therefore indicated to be a result of individual, physical and of psychosocial origination (Cassidy *et al*. 2009). Dvorak *et al* (2001) identified psychosocial variables that accounted for approximately one-fourth of self-reported pain and approximately one-third of disability. By identifying the psychosocial factors or "yellow flags" with the use of disability questionnaires at an early stage, clinicians are assisted in detecting neck pain before it becomes chronic. This aids in the prevention of chronic spinal pain and disability and allows clinicians to manage the patients using a biopsychosocial approach (Kline 2003).

AIM: The study sets out to determine a psychosocial profile and to identify the prevalence of risk factors for chronic pain among patients presenting to the Durban University of Technology (DUT) Chiropractic Day Clinic (CDC) with non-specific neck pain.

METHODOLOGY: The design of the study was a quantitative paradigm, using a prospective, descriptive and survey based study. After ethical clearance was gained, the research process began at the DUT CDC. One hundred and nine participants completed informed consent, demographic, Neck Disability Index (NDI) and yellow flags form questionnaires. The NDI was used to assess the chronicity of the participants, while the yellow flags form was used to assess the risk of disability of the participants by using a numeric score at the end of the questionnaire. Both are comprehensive tools used in this study. All the questionnaires were kept confidential and only viewed by the researcher. A code was allocated for each questionnaire before the data was captured and sent to the statistician for data analysis.

RESULTS: One hundred and nine questionnaires were utilised for statistical analysis. The population was 109 participants who attended the DUT CDC with complaints of non-specific NP over a four-month period. The participants were aged from eighteen to eighty-one years with a mean of 35. Among the total number of participants, 57.7% were female. The BMI values showed that majority of the participants were overweight and obese, which was 48.4% of the population. Majority of participants, 57.7% gained a tertiary education, while 4.5% obtained no formal education. Non-smokers (77.5%) and non-drinkers (58.6%) were the majority in this study. Most participants (78.4%) engaged in some form or physical exercise. Fully employed participants (45%) were the largest category in terms of work status. The employed participants were mainly involved in sitting as the most common, or light physical work.

According to the psychosocial factors of work satisfaction, 26.1% rated their work as good and 18% rated their work as great showing that they were satisfied with their work. From this particular study, 36.9% of the participants were at a high risk of chronicity according to the NDI and 37% of the participants were at a high risk of disability according to the yellow flags form. Both these tools results correlate with each other, showing that this percentage of participants is at risk of chronicity and disability. Spearmans correlation shows that a moderate relationship between the NDI and the yellow flags form (risk of chronicity), whereby if the NDI score is high, then the risk of chronicity will also be high.

CONCLUSION: The results of this study suggest that one third of the participants with non-specific NP who presented to the DUT CDC were at risk of developing chronic NP.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABBREVIATIONS

BMI Body Mass Index

CDC Chiropractic Day Clinic

CSF Cerebrospinal Fluid

DUT Durban University of Technology

IREC Institutional Research and Ethics Committee

IV Intervertebral

N Sample Size

NDI Neck Disability Index

NP Neck Pain

SA South Africa

SMT Spinal Manipulation Therapy

WHO World Health Organisation

CHAPTER ONE: INTRODUCTION

1.1 INTRODUCTION TO THE STUDY

According to the World Federation of Chiropractic (2009), neck pain (NP) was a common problem responsible for disability. When treating a NP patient, it was important to identify those at risk of developing chronic NP. NP was of multifactorial origin and therefore indicated to be a result of individual, physical and of psychosocial origination (Cote *et al.* 2009).

Psychosocial factors contribute greatly to the etiology of neck pain in terms of stress, anxiety, work satisfaction and economic status. Dvorak *et al.* (2001) identified psychosocial factors that accounted for approximately one-fourth of self-reported pain and approximately one-third of disability. By identifying the psychosocial factors or “yellow flags” with the use of disability questionnaires at an early stage, it assists clinicians in trying to prevent neck pain before it becomes chronic. This assists with preventing chronic spinal pain and disability and allows clinicians to manage the patients using a biopsychosocial approach (Kline 2003).

The Durban study conducted by Seethal (2010) shows that 57.4% (n=352) had psychological risk factors of low back pain (LBP). Another study was conducted by Bramuzzo (2016) at the DUT Chiropractic Day Clinic (CDC) looking at a psychometric profile on non-specific LBP which showed 23.5 % (n = 31) of the total population had a high risk of developing chronic LBP. Both these studies further highlight the paucity of literature on psychosocial factors and non-specific NP in a Durban population, as no local research had been conducted on chronic NP.

1.2 AIM AND OBJECTIVES

1.2.1 Aim

The study sets out to determine a psychosocial profile and to identify the prevalence of risk factors for chronic pain among patients presenting to the Durban University of Technology (DUT) Chiropractic Day Clinic (CDC) with non-specific neck pain.

1.2.2 Objectives

1.2.2.1 To determine a demographic and psychosocial profile of patients with non-specific neck pain at a DUT CDC.

1.2.2.2 To determine a pain and disability profile of patients with non-specific neck pain at a DUT CDC.

1.2.2.3 To determine a yellow flags profile of patients presenting with non-specific neck pain at a DUT CDC.

1.2.2.4 To determine the association between the demographic and psychosocial profile, pain and disability profile and the yellow flags profile.

1.3 RATIONALE

Neck pain was the second most prevalent musculoskeletal complaint seen in clinical practice, following lower back pain. Third world countries such as South Africa have a higher prevalence of non-specific neck pain as it affects approximately 80% of the population (Ferarri and Russel 2003). The neck pain course generally fluctuates, as many individuals do not fully recover from their symptoms, causing at least 5-10% of neck pain patients to become chronic sufferers. Psychosocial factors play a vital role in chronic non-specific NP as anxiety, stress and depression Impact negatively on the

neck, resulting in much disability (Humphreys *et al*. 2016). Thus, causing a direct link between chronicity and the ability to manage pain effectively.

Many individuals suffering from non-specific NP were commonly found in underprivileged populations. Such populations lack the finances or resources to seek proper treatment, especially in the public sector, as highlighted by a study done in Nigeria (Akinpelu *et al*. 2009). This makes the population more prone to becoming chronic sufferers of non-specific NP and can result in greater disability in the community (World Federation of Chiropractic 2003).

Identifying these psychosocial factors with the use of disability questionnaires, such as the Neck Disability Index (NDI) and yellow flags form, allows clinicians an opportunity to identify individualised treatment strategies for specific patients. This encourages both students and clinicians to combine the best of "traditional" biomechanical treatment and a biopsychosocial approach with the maximum effectiveness of Chiropractic management (Field *et al.* 2013).

1.4 LIMITATIONS

All the research participants were expected to be completely honest during the research process when answering the questionnaires. Unfortunately, there was no way of measuring the extent of the participant's honesty and therefore all responses were taken into consideration and were included in this study.

1.5 OUTLINE OF THE CHAPTERS

Chapter one introduces the research study, demonstrates the gap in the literature, states the aim and objectives, discusses the rationale of the study and describes the limitations and benefits of this study. Chapter two is the literature review which discusses NP, psychosocial factors that influence NP and factors that affect the chronicity of NP and the biopsychosocial approach. Chapter three describes the research method and materials needed for the research process. Chapter four portrays the results gathered from the research process. Chapter five is the discussion

and analysis of the results and chapter six is the conclusion of the study and any further recommendations for any future studies.

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

Neck pain NP) is a major issue in the public health sector- both in terms of personal health and overall wellbeing for the patient (Fejer *et al*. 2006).It affects about 30-50% of the general population annually and 11-14% of the working population (Carragee *et al.* 2008). Chronic NP has been experienced by at least 15% of the general population in their lifetime. Non-specific NP accounts for 90% of cervical pain. It generally develops gradually through persistent incorrect biomechanical stress. This stress is further exerted because individuals fail to take frequent breaks from work and lack of participation in physical activity. This can result in impairment of the length-tension relationships of the muscles. The wear and tear of the intervertebral discs and the vertebral joints cause fear avoidance behavioural patterns. This results in a lack of movement as a protective mechanism. These factors all result in pain, which may cause radiation of pain in to the posterior aspect of the head, forehead, neck, shoulders and upper arm and present as a pseudo-radicular form (Boos and Leonardi 2008).

2.1 CERVICAL ANATOMY

2.2.1 The Vertebral Column

The vertebral column begins from the base of the skull and extends down the spine to the tip of the coccyx. Overall there are 33 vertebrae - seven make up the cervical spine located between the cranium and thoracic spine and contain intervertebral discs and the associated ligaments that attach to them (Moore 2010).

2.2.1.1 **Cervical Vertebrae**

The cervical spine consists of seven vertebrae that are the smallest of 24 movable vertebrae. Another characteristic finding is that each cervical vertebra consists of a foramen in each of the transverse process known as a foramen transversarium (Grays 2013). Due to their size and shape, they are unable to bear as much weight as the larger inferior vertebrae.

2.2.1.2 **Intervertebral (IV) Discs**

The intervertebral discs consist of an inner nuclear pulposus surrounded by an outer annulus fibrosis. The nuclear pulposus consists of a mucoid gelatinous substance and

acts as a shock absorber of compressional forces between the vertebral bodies, while the annulus fibrosis consists of fibrocartilage arranged in concentric rings known as the lamellar limits rotational movements (Grays 2013). The intervertebral discs in the cervical spine are much thinner than that of the inferior vertebrae but are much thicker than that of the actual vertebral body (Moore 2010). The thickness of the discs in combination with the horizontal arrangement of the articular facets and the minute amount of surrounding body mass allow for an increased range of movement of the vertebral region.

2.2.1.3 **Ligaments**

A ligament is defined as “a short band of tough, flexible fibrous connective tissue which connects two bones or cartilage or hold together a joint” (The Medical Dictionary 2007). Ligaments serve to provide stability to a joint during movement and restriction to a joint during excessive movement (Bridwell 2016). There are three main ligaments in the spine namely the ligamentum flavum that encloses the dura mater and protects the spinal cord, the anterior longitudinal ligament that passes anterior to the vertebral bodies and the posterior longitudinal ligaments that runs posterior to the vertebral bodies. The primary spinal ligaments include the alar ligament, the anterior and posterior atlantoaxial ligament and the ligamentum nuchae.

2.2.2 The Vertebral Canal

The vertebral canal is a space in the vertebral column that comprises the vertebrae through which the spinal cord passes. This column consists of the spinal cord, meninges, the nerve roots and neurovascular structures of which they supply (Moore 2010).

2.2.2.1 **The Spinal Cord**

It is the chief reflex centre, which consists of paths among the brain and the human body. The surrounding vertebrae, ligaments, muscles, meninges and cerebrospinal fluid (CSF), protect this structure. The cord begins from the foramen magnum, continues as the medulla oblongata and travels inferiorly where it becomes the conus medullaris (Moore 2010). The spinal cord and nerve roots are cushioned and suspended in the subarachnoid space and the cerebrospinal fluid (CSF). The epidural space contains fibro-fatty tissue and the venous plexus isolates the cord from the

movement of the laminae. The canal is largest at C1-C3 and the cord is the largest at C3-T2.

2.2.2.2 **The Meninges**

The spinal meninges are three covering membranes: the dura mater, arachnoid mater and pia mater, which house and protect the spinal cord (Grays 2013).

2.2.3 The Muscles

The cervical spine and neck is supported by a variety of structures and vital muscles. The anterior musculature consists mainly of the sternocleidomastoid. This muscle assists with the movement of the craniovertebral joints and the cervical intervertebral joints (Moore 2010). There are two classifications of back muscles known as the intrinsic and extrinsic muscles. The suboccipital muscles are a small group of intrinsic muscles of the posterior neck that facilitate the movement of the head. They occur at the upper cervical region, connecting to the base of the occipital bone, the atlas (C1) and axis (C2) (Grays 2013). Another significant muscle is the trapezius muscle that assists in suspending the neck. These muscles help with the maintenance of posture, supporting of the head and neck, and facilitating movement of the neck.

2.2.4 Fascia

Fascia is layers of connective tissue known as fascial sheaths. The deep cervical fascia is made up of three layers, which spans between the muscles, viscera, vessels and deep lymph nodes and aids in the distribution of forces and supporting the spine (Moore, Martin 2010).

2.2.5 Cervical Innervation and Vasculature

2.2.5.1 **Innervation**

The posterior neck muscles and the facets joints (zygapophysial joints) of the cervical spine are innervated by the cervical dorsal rami. The atlanto-occipital joint is innervated by C1 ventral rami. The lateral aspect of the atlanto-axial joint is innervated by C2 ventral rami. The sinuvertebral nerves (C1, C2 and C3) innervate the median aspect of the joint and its surrounding ligaments. These nerves also supply the dura mater of the spinal cord. The cervical IVDs receive innervation from various sources. Branches of the anterior vertebral plexus innervate the anterior aspect. The posterior vertebral plexus innervates the posterior aspect and the branches of the vertebral nerve innervate the lateral aspect (Bogduk 2003, Grays 2013).

2.2.5.2 **Vasculature**

The suboccipital region has the suboccipital artery that originates from the external carotid artery and runs posterior-superiorly to the mastoid process. It runs under the splenius capitus muscle and the sternocleidomastoid muscle lying superiorly to lie with the greater occipital nerve. From this point, it spreads out to supply the vertex of the scalp. The deep cervical arteries originate from the costo-cervical trunk of the subclavian artery at the upper borders of the first ribs. It passes posteriorly behind the first rib and the C7 transverse process to the back of the neck to the back of the skull. At this point it anastomosis with the occipital and vertebral arteries (Grays 2013).

2.2 PAIN

Pain is defined by the International Association for the Study of Pain as an “unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (Garland 2012). Pain has a sensory, afferent and cognitive apparatus.

2.3.1 Theories of pain

There are essentially three theories of pain namely:

2.3.1.1 **The Specificity Theory**

It is essentially one of the earliest modern theories of pain and believes that each stimulus has a separate receptor and related sensory fibre (afferent) that reacts only to the stimulus from a somatosensory modality (Moayedi and Davis 2013).

2.3.1.2 **The Intensity Theory**

This theory defined pain in terms of an emotional stimulus that was stronger than any other, rather than a sensory experience (Moayedi and Davis 2013).

2.3.1.3 **The Pattern Theory**

This term overlooked evidence of specialized nerve endings by suggesting that every sensation arose from a particular design of firing of the nerves. It was known as a “quantitative theory of feelings”. (Moayedi and Davis 2013).

2.3.1.4 **The Gate Control Theory**

Ronald Melzack and Patrick Wall first published the gate control theory in 1965. Melzack and Wall took into consideration that there are nociceptors (pain fibres) and touch fibres that synapsed at different origins of the dorsal horn of the spinal cord. The

model suggested that signals from the primary afferent (skin) were conveyed into three regions of the spinal cord namely the substantia gelatinosa, the dorsal column and transmission cells (group of cells). They further suggested that the gate of the spinal cord was the substantia gelatinosa (dorsal horn) that communicated sensory information from the primary afferents to the transmission cells. The gate was controlled by the action of the large and small fibres. The large fibres closed the gate by raising the threshold and inhibiting it, while the small fibres opened the gate by lowering the threshold and enabling the actions. When a nociception stimulus triggered the gate by exceeding the threshold, it caused the opening of the gate and triggered the pathways that allowed for the feeling of pain and its associated behaviours (Melzack and Wall 1967; Keller and Krames 2009; Moayedi and Davis 2013; Mendell 2014). The theory describes pain as a complex nature. A variety of factors can contribute to our pain, such as our experiences and emotions (Centre of Health Integrated Healthcare 2013).

Factors that open the gate:

Opening of the gate is influenced by our emotions of how we feel and can contribute to experiencing pain in an exaggerated way. The following factors can contribute to it:

- Stress and tension
  Emotional states can cause further opening of the gate. These states include feelings of anxiousness, worrying, anger and depression.

- Mental factors
  By focussing your attention on your pain, it can cause an increase of opening of the gate.
  Another contributing factor is boredom.

- Lack of activity
  This causes stiff joints and lack of fitness when one does not move around or become an active participant in activity, which further increases the opening of the gate.

Factors that close the gate:

Like the above, our emotional states also contribute to closing the gate and reducing our painful states.

- Relaxation and contentment:
  Emotions such as happiness, contentment and optimism assist in closing the gate therefore relaxation and meditation aid the body in this way.

- Mental factors
  Focussing on other factors and interests of life assists in distracting one from the feelings of pain that one may be experiencing, thus causing the closing of the gate.

- Activity
  When an individual engages in physical activity, it triggers a release of endorphins. This assists with the development of the body's fitness level, which allows for the closure of the gate.

- Other physical factors
  Medications (e.g. antianxiety and antidepressants) and other counter-stimulants such as electro-modalities (TENS), cryotherapy and heat therapy, acupuncture/dry needling and acupressure, soft tissue work, and massage can all aid to relieve pain by closing the gate.

2.3 CHRONIC PAIN

Chronic pain is defined as "pain persisting beyond the resolution of the initial pain causing a stimulus" (Alcantara *et al*.2013). Chronic pain is pain that persists for more than three months. It is referred to as pain of a complex nature where there are interactions of legal, psychosocial, medicinal and family matters. Chronic pain patients generally experience issues with psychosocial and emotional aspects of pain. Evidence shows the pre-existing psychosocial influences play a contributing role in the development of chronic pain.

Chronic pain is a vicious cycle in which pain results in disability and stress, that in turn, can aggravate the pain. Factors like an unhealthy lifestyle, lack of social support, depression and substance abuse are all contributing influences on chronic pain (Hansen and Strelzer 2005).

About 5-10% of all NP can result in chronic pain (Humphreys *et al*. 2016). Most individuals who suffer from chronic pain symptoms generally fall into the category of non-specific neck pain (Binder 2007).

2.4 DEFINING NECK PAIN (NP)

Non-specific neck pain is defined as pain located by a horizontal line to the most inferior portion of the occipital region and a horizontal line through the spinous process of the first thoracic vertebra (Atamaz *et al*. 2007). It is a common worldwide problem affecting at least two thirds of individuals in their lifetime (Woolf and Pfleger 2003). Neck pain does not imply that the origin of the pain is limited to the area that it surrounds (Bogduk 2003). It defines the pain simply as the area in which the patient feels and experiences the pain. Recent studies elaborate on the connection of somatic symptoms and the psychological perceptions emphasizing the social support, psychological factors or patients' coping strategies over the prognosis of neck pain (Himmel *et al*. 2011). It has become a multifactorial disorder, which is a major problem in modern society (Ariens *et al*. 2001). Neck pain is a chronic episodic condition that is characterised by episodes of persistent, recurrent or fluctuating disability (Cassidy *et al*. 2004). It can be subdivided by the mechanism of neck pain namely mechanical, neuropathic or myofascial pain (Steven 2015). Neck pain has several pathophysiological mechanisms and is therefore unlikely to occur from a single entity (Cagnie *et al*. 2007). Being one of the most common musculoskeletal problems within the primary care sector, it results in much disability (Rekola *et al*. 1993). Neck pain can generally be associated with specific conditions such as fractures, neurological compromise, vascular disorders and inflammatory disease. Many reported neck pain cases are unable to be identified and are therefore classified as non-specific neck pain (Hoving *et al*. 2001).

2.5 EPIDEMIOLOGY OF NECK PAIN

Between 27% and 48% of individuals develop non-specific neck pain each year (Rothfels *et al*.2010). An estimated prevalence rate of 31.4% of neck pain sufferers were identified in a Dutch setting (Bot *et al*.2005) and approximately 22-30% (n=102) were reported in a Turkish setting (Atamaz *et al.* 2007). A cross-sectional descriptive study showed 73% prevalence of non-specific neck pain in a Nigerian setting (Akinpelu *et al.* 2009). At the DUT CDC, 1342 of 7487 files had reported neck pain over a ten-year period (Venketsamy 2007).

2.6 RISK FACTORS FOR NECK PAIN

The risk factors associated with neck pain were categorised into physical, psychosocial and lifestyle specific factors. Physical factors refer to physical work and exercise, psychosocial factors refers to psychological distress such as anxiety due to employment status and lifestyle factors refers to habits such as smoking and alcohol consumption. However, psychological manifestations are considered a major contributor of non-specific neck pain (Ariens *et al*. 2001). The association between psychological and social factors share a link to the development of non-specific neck pain, rather than just pain alone (Chiu *et al*. 2004). These risk factors include age, gender, socio-economic status and employment status (Croft *et al*. 2001).

2.7.1 Sociodemographic Risk Factors

2.7.1.1 Age

The most commonly affected age group suggested by Lal (2008) was between the ages 44-46 years. Another study carried out by Holtermann *et al*. (2011) showed evidence that NP was experienced around the age of 45. Other evidence shows that the category of 50-59 years and 60 years and older showed a greater disability compared to younger groups that range between 30 and younger, 30-39 years and 40-49 years of age (Asghari 2011). Another study conducted by Guez *et al*. (2015), showed that individuals between the ages of 45-64 were more susceptible to developing NP. All the studies show that as age increases, the prevalence of neck pain increases and this in turn can also result in disability due to the NP that can become chronic.

2.7.1.2 Gender

Evidence shows a higher prevalence of neck pain in females as opposed to males, suggesting that females are at a higher risk of suffering from neck pain (Steven 2015 and Cohen 2015). Alves *et al*. (2015) who also stated that NP is significantly prevalent in females, agree on this. These statements can be further substantiated by studies performed in various populations. A Norwegian population shows an occurrence of 29% (n=1304) in males and 40% in females (Ariens *et al.* 2000). This is further supported by evidence found in an Australian population that showed 11% in males and 13.5% in females (Ashghari 2001). In Hong Kong there was a prevalence of 15% (n=78) in males and 15% in females (Chiu *et al*. 2004). Finally, in a Spanish population there is a frequency of 77.8% (n=221) in females (Bago *et al*. 2008). Females seem to be the more prevalent gender in terms of the development of NP.

2.7.1.3 BMI

BMI stands for body mass index. BMI is graded in the following way:

Less than 18.5 = Underweight

18.5-24.9 = Healthy weight

25-29.9 = Overweight

30 or more = Obese

BMI is calculated with weight (kg) over height (m) squared (Department of Health and Human Services and Centres for Disease Control and Prevention 2011). Obesity is linked to an increase in musculoskeletal pain and disorders, which results in much disability (Christensen *et al*. 2011). In terms of NP and obesity, a Saskatchewan study showed that there was no evidence to link the two (Cassidy *et al*. 2000). This is further substantiated by another study that claims that there is no association between obesity and neck pain (Cohen 2015, Abreu *et al*. 2013).

2.7.1.4 Level of Education

In South Africa (SA) there has been an increase in terms of levels of education over the past decade. Evidence shows that there is an approximate of 4% increase in the number of individuals over the age of 20 who have achieved their matric and approximately 6% of individuals who pursued and achieved a tertiary education over the past decade (Statistics South Africa 2014).

Lal (2008) states that the level of education allows the individual of a higher education to appropriately interpret and understand the pain, whereas people of a low education level are more ignorant to the pain and its effects. This also influences the type of treatment approaches they undertake thereafter. Individuals with a higher education level are more aware of living a healthy lifestyle as opposed to those who have a lower education level. This is typical in individuals with high education statuses whereby they are aware of the correct ergonomics at the work place, the dietary advice they would undertake, and the lifestyle they would lead. Controversy arises as a study carried out by Alves *et al.* (2015) states that there is no link between pain and education statuses. It refers to individuals who are either of a high or low education status, both with stressful lifestyles. One is trying to gain enough income to support a family and with no proper formal education it becomes difficult to find work. The other refers to the individual with a high-status job that deals with increased stress to make important decisions that could influence the company on a wide scale. These situations both increase stress and strain to the neck due to prolonged working hours and the stressful environments, resulting in pain (Ahlberg *et al.* 2002; Derriennic *et al.* 2002).

2.7.1.5 Smoking

Smoking of tobacco is a great concern for those in SA as it influences health negatively in a number of ways. In SA approximately 17.6 % of all adults are tobacco smokers. There is a prevalence of 29.2 % of male smokers and 7.3 % of female smokers in SA (Kim *et al.* 2015). Smoking can provoke disc herniation through violent coughing, or cause pathological changes in the IVD because of alterations of nutrition, PH levels or mineral content with in the disc (Coggon *et al.* 2003). It can influence hormonal function, as it indirectly affects vitamin D absorption, intestinal calcium absorption and affects the vessels and oxygen supply (Abate *et al.* 2013). It occurs more especially in females, causing an increase in oestrogen levels in those who are perimenopausal/postmenopausal. Smoking can cause a decrease the mineralisation of the bones, causing it to become brittle and resulting in osteoporosis. Once the bone becomes osteoporotic, it loses bone density, making it more brittle (Davidson 2017). This process can result in the individual experiencing an increase in the amount of pain due to smoking (Logan *et al*. 2010; Ditre *et al*. 2011). All these factors related to smoking can be dependent on excessive smoking over the years, taking into account

the age, sex and amount of cigarettes smoked over the individuals lifespan which may make the individual more prone to above conditions (Abate *et al*.2013).

2.7.1.6 Alcohol Consumption

Alcohol consumption can be extremely debilitating to one's health as it affects the mind and body, and has addictive tendencies. In SA approximately 70% of the population engages in drinking alcohol from age 15 onwards (World Health Organization 2014a). In SA moderate alcohol use is said to consist of less than - or only - one standard drink daily for females, or less than - or only - two standard drinks for males. It has been shown to reduce the risk of myocardial infarction and coronary heart disease mortality (Jacobs and Steyn 2013; Zale, Maisto and Ditre 2015). Evidence shows there is no major correlation with little or moderate alcohol consumption, although once an individual consumes alcohol on a large-scale, problems begin to occur. Alcohol usually affects the body by interfering with the absorption of calcium and bone formation, resulting in osteoporosis (Gunasekara 2015). Alcohol can be an alternative used by individuals who are suffering from psychosocial issues such as depression, resulting in dependency tendencies. It influences an individual's perception of life as it alters one's character and perception of pain. Heavy consumption of alcohol involves having more than six standard drinks on a single occurrence, and occurs more than once in a month. This can result in sudden death due to heart failure. Chronic alcohol use was linked to high blood pressure, as well as impairment of judgement and concentration that can increase drowsiness, resulting in a coma (Gunasekara 2015). Therefore, alcohol can be one of the source influences of NP (Ditre *et al*. 2015).

2.7.1.7 Work and Physical Activity

Many work-related neck disorders have contributing factors like the intensive use of a computer. There is evidence that the aetiology of neck pain disorders is multidimensional and can be associated greatly with a trio of individual, physical and psychosocial factors (Cagnie *et al*. 2007). With occupational manifestations like increased bending and twisting forces, it can aggravate NP, causing the individual to skip workdays due to pain. This can result in low employment and impact on the individual's socioeconomic status due to the pain causing them to take on a disabling role (Cote *et al.* 2000). Non-specific NP influences the functional status of patients as it affects basic activities like sleeping, personal care and work-related activities (Bago *et al*. 2008). A systematic review shows evidence that with high demands at work,

individuals have poor control and support of their lifestyles. This contributes greatly to the signs and symptoms of non-specific neck pain as they are associated with these psychosocial factors (Bongers *et al*. 2006), and increase the risk of disability and work absenteeism (Bago *et al.* 2008). This is further substantiated in the study conducted on office workers that shows that there is a direct link between physical and psychosocial work factors and the frequency and association of neck pain (Cagnie *et al.* 2007). There is evidence that further highlights the relationship between NP and high job demands, poor social support and interpersonal skills, low job control and organisation, low skills, low job satisfaction and poor finances and economics (Ariens *et al.* 2001). Evidence further suggests that there is a high correlation between psychosocial work demands and physical work demands, which again highlights the direct link between psychosocial factors and the occurrence of neck pain (Cagnie *et al.* 2007).

2.7.2 Psychosocial Risk Factors

Croft *et al* (2001) categorised an acute musculoskeletal syndrome by the type and location of the pain and whether it is inflammatory or infective. There are three mechanisms of psychosocial factors and musculoskeletal disorders:

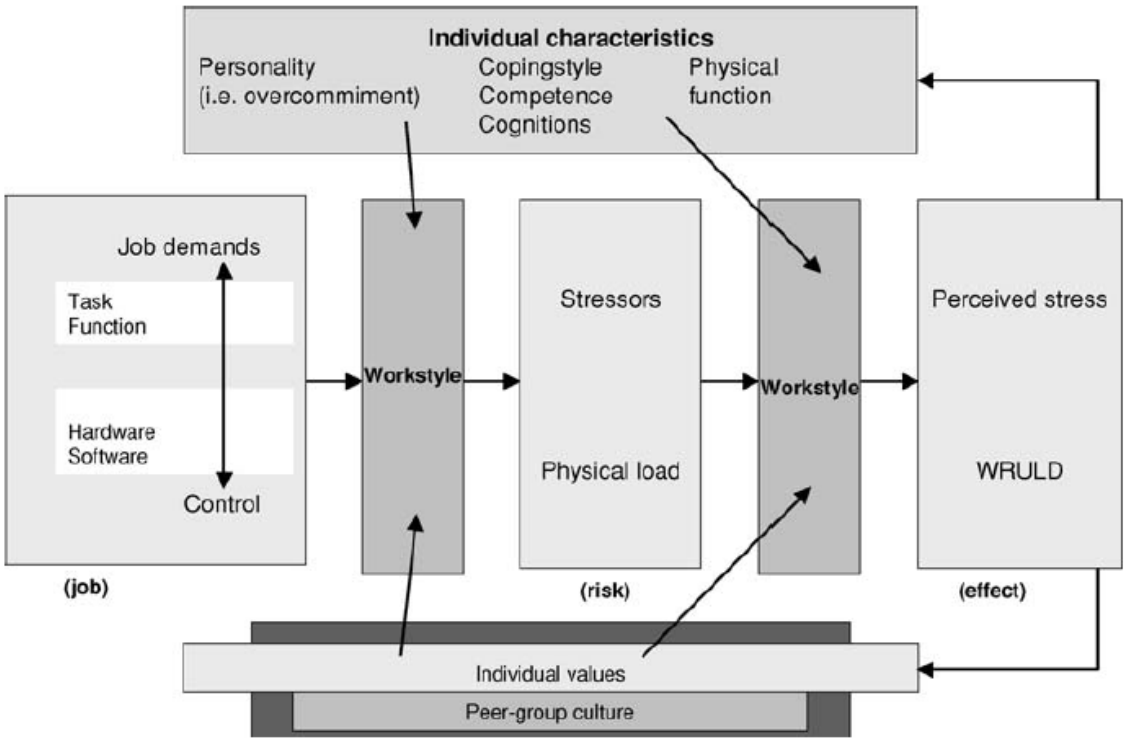
1. Psychosocial demands vs. individual coping strategies, which causes a stress response causing muscle tension and loading, resulting in a physiological response that causes neck pain.

2. Psychosocial demands that influence the reporting of musculoskeletal disorder and affect `awareness of this.

3. Psychosocial demands that connect with physical demands (Ariens *et al*. 2001).

While chronic syndromes originate from an acute origin of pain, it can also be categorised as a cultural or psychological manifestation (Croft *et al*. 2001). As stated by Linton (2000) there is a psychosocial link between the progression of acute to chronic pain and that of psychosocial factors and the development of non-specific neck pain. Ferrari and Russels (2003), who state that the psychosocial factors contribute to the chronicity of pain, further substantiate this.

Figure 2.1: The relationship between the risk factors and personal origin for neck problems:



(Illustration taken from the National Research Council and the Institute of Medicine)

2.7 RED AND YELLOW FLAGS

"Yellow flags" are described as "psychosocial prognostic factors for the development of disability following the onset of musculoskeletal pain" (Linton *et al.* 2011). The eleven prognostic factors of musculoskeletal pain are higher pain severity at the baseline, increased pain duration, multiple site pain, previous pain episodes, anxiety and/ depression due to pain, higher somatic perception and/or distress, adverse coping strategies, low social support, older age range, higher baseline disability, greater movement restrictions (Croft *et al.*2007). Various factors contribute to these

yellow flags namely iatrogenic factors, beliefs, coping strategies, distress, illness behaviour and a willingness to change. These act as predictors of psychological and behavioural factors (Main and Williams 2002).

The manifestations of non-specific neck pain referred to cognitive behaviour components whereby one avoids taking on the sick role and starts to think in a disabling way, e.g. becoming less active in daily activities (Liebenson 2007). This is further substantiated by the fear avoidance model that there are differences in pain catastrophizing whereby there is an exaggerated negative orientation of the noxious stimulus which is a precursor of the fear of movement (de Kroon and Vastenholt 2003).

Research has shown that fear avoidance behaviour usually begins prior to the individual's symptoms becoming chronic, just as the patient's coping mechanisms influence the condition transitioning from acute to chronic (Linton 2000). Psychosocial factors contribute to increased levels of distress, which causes a misunderstanding of pain and the implications of pain. This causes avoidance and fear of physical activity, which causes the individual to become less active and more sedentary, which can worsen the pain (Main and Williams 2002). Balderson and Von Korff (2002) stated that fear avoidance behaviours needed to be addressed from a biopsychosocial approach to relieve non-specific neck pain and aid in the recovery of the patient to normal daily activities.

Yellow flags are of vital importance. They can be related to the unemployment and manual labour of individuals. Those factors can result in a decrease in productivity and an increase in absenteeism from their daily processes (Liebenson 2007). There is paucity in the data pertaining to the relationship between non-specific neck pain and psychosocial problems in the South African context, more especially in the eThekwini Municipality. The DUT CDC was established in 1994 as a teaching and learning facility (DUT 2016). The researcher gathered data from patients that presented to the DUT CDC. This data in this study aimed to fill the paucity in the literature with the use of the yellow flags form. The yellow flags form was developed by Dr Craig Liebenson (2007). It was used for the early identification of risk factors of chronicity. A patient with yellow flags score that is high will experience abnormal illness behaviour or is at risk for it whereby the patient begins to think in a disabling way.

Red flags are signs and symptoms of a potential serious pathology (Turnpenney *et al.* 2013). These are guidelines in the absence of trauma that assist with assessment of ruling out serious pathology such as the history of cancer, unexplained weight loss, fever, intractable pain, prior neck surgery, IV drug use and infections (Nordin *et al.*2008).

When assessing for red flags, pay attention to the following:

Referred pain that is multi-segmental or band like

Escalating pain which is poorly responsive to treatment, including medication

Different character or site to previous symptoms

Funny feelings, odd sensations or heavy legs (multi-segmental)

Lying flat increases the pain

Agonising pain, causing anguish or despair

Gait disturbances, unsteadiness, especially on stairs

Sleep grossly disturbed due to pain being worse at night

(Turnpenney *et al.* 2013)

Table 2.1	What Not To Miss: "Red Flags" AssociatedWith Neck Pain	
Red Flag	**Potential Conditions**	**Associated Signs and Symptoms**
Trauma (Eg: Fall,MVA, Whiplash injury)	Vertebral fractures, spinal cord injury/syrinx ligamentous disruption	Loss or alternating conciousness, cognitive deficits, traumatic brain injury, headaches, neulogic symptoms
Rheumatoid arthritis, Down syndrome, spondyloarthropathy	Atlantoaxial subluxation	Easy fatiguability, gait abnormalities, limited neck mobility, torticollis, clumsiness, spasticity, sensory deficits, upper motor neuron signs
Constitutional symptoms	Metastases, infectious process, systemic rheumatologic disease	Weight loss, unexplained fevers, anorexia, family/personal history of malignant neplasm, diffuse joint pain and stiffness, abnormal laboratory test results
Infectious symptoms	Epidural abscess, spondylodiskitis, meningitis	Fever, neck stiffness, photophobia, elevated white blood cell count
Upper motor neuron lesion	Spinal cord compression, demyelinating disease	Hoffmann sign, hyperreflexia, Babinskis sign, spasticity,incontinence, sexual dysfunction
Age<20y	Congenital abnormalities (cervical spina bifida, Scheuemanns disease), condition associated with substance abuse such as infection	Congenital anomalies: birthmarks, overlying skin tags, patche sof hair,family history, sytemic disease (Eg diabetes, epilepsy for spina bifida)
Concurrent chest pain, diaphoresis, or shortness of breath	Myocardial ischaemia or infarction	Nausea, extension of pain into the left arm (especially medial upper arm)
Age>50y	Metastases, vertebral fracture, carotid or vertebral artery dissection/ bleeding	Family or personal history of malignant neoplasm, previous trauma. Arterial dissection: tearing sensation, headache, visual loss or other neurologic sequelae

Table 2.1 derived from Cohen (2015)

‘Red Flag’ features and diagnoses they suggest

Malignancy, infection and inflammation

-Fever, night sweats

-Unexpected weight loss

-History of inflammatory arthritis, malignancy, infection, TB, AIDS, drug dependency, or immunosuppression

-Excruciating pain

-Cervical lymphadenopathy

-Exquisite tenderness over the vertebral body

-Intractable night pain

Myelopathy

-Gait disturbances and clumsy hands

-Objective neurological deficit- upper motor neurone signs in the legs and lower motor neurone signs in the arms

Other

- History of severe osteoporosis

-History of neck surgery

-Drop attacks especially when moving the neck

-Intractable or increasing pain

Following whiplash

- Midline cervical tenderness

-Loss of consciousness

-Intoxication by alcohol or drugs

-Objective neurological deficit

-Distracting injury

(Binder 2007)

2.8 BIOPSYCHOSOCIAL MODEL AND APPROACH

The modes of disability allow a framework of interpreting and understanding the way people experience disability. It also provides a base for individuals to develop certain protocols that may influence the lives of people who are disabled. There are two main models, namely the medical model and the social model. The medical model interprets disability as people who may have experienced disease, trauma or some kind of health condition. In this study we focus on the social model as it views disability as a social issue and not a character trait of the individual. Since both these models are not adequate to interpret the nature of an individual's health, there is one other model that comes into play, which is the biopsychosocial model.

A biopsychosocial model is defined as "consideration of the biological, psychological and social factors and their complex interactions in understanding health, illness and healthcare delivery" (Frankel *et al*. 2003). The biopsychosocial model interprets disability as an interaction of the individual's health and the environmental factors that influence their lives. This model views pain in a more holistic context and views the patient's pain and disability as a classification that comprises the patient's pain, their attitudes and beliefs about pain, elements of psychological distress experiences, illness behaviours exhibited, and the parameters of the social environment in which the patient functions (Beneka *et al.* 2009).

The biopsychosocial approach influences the topic of chronic pain as it emphasises both disease and illness and their interaction with biological, psychological and social aspects (Gatchel 2005). There is a distinction between disease and illness and the nociception and pains. Nociception involves a stimulation of a nerve that transports a message of potential tissue damage to the brain, whereas the pain is perception of transduction, transmission and the modulation of the sensory data. This data can be influences by factors of the individual's genetic composition, prior education history, their recent psychosocial status and social cultural encouragements (Fuchs *et al*. 2007).

2.9 EVALUATION AND MANAGEMENT

2.10.1 Evaluation

A careful and thorough case history is required when assessing a patient with neck pain. The history focusses on the symptoms or any cause of previous or current trauma. The main objective during the history taking is to pay particular attention to any red flags present. These red flags may indicate a serious pathology that may require specific and precise treatment and management. Potential morning stiffness that relieves throughout the course of the day may be arthritic-related changes, whereas fever, weight loss, or night sweats may be a potential systemic condition, such as an infection or neoplasm. Any associated nocturnal pain - especially with a previous history of malignancy - may be a secondary bone tumour. Disturbances of one's gait, loss of balance, sphincter incontinence or loss or co-ordination may be indicative of a myelopathy. All the above examples require further investigation in the form of x-rays, MRIs, ultrasound or a CT scan.

A physical examination is vital in determining and reaching an appropriate diagnosis. One should focus on observation in terms of the patient's posture, any deformities present and the patient's ability to execute movement without any compensation or difficulty. Thereafter, one needs to palpate all important and vital structures such as the lymph nodes, thyroid and saliva glands. The muscles surrounding the cervical spine may also be palpated for any myofascial trigger points or tenderness within the muscles. The range of motion exam needs to be performed to evaluate the various ranges of flexion, extension, lateral flexion and rotation. A neurological exam needs to be performed to detect any sensory or motor deficits, as well as assessing the patient's reflexes (Bope and Douglas 2004).

Treatment guidelines of neck pain according to the Task Force:

Grade 1 Neck Pain

- No symptoms or signs of major pathology and no, or little, interference with daily activity.
- No further investigation.
- Reassurance that significant underlying pathology is unlikely.
- Self-care (remain active, simple analgesics, avoid immobilisation).

- Occasionally conservative therapy option.

Grade 2 Neck Pain

- No symptoms or signs of major pathology, but interference with daily activities.
- No further investigation.
- Reassurance that significant underlying pathology is unlikely.
- Assess for environmental or personal factors that may be contributing to the clinical presentation.
- Consider conservative therapy options.

Grade 3 Neck Pain

- Neck pain with neurological signs and symptoms (radiculopathy).
- Does not require immediate referral or investigation unless major neurological deficit exists.
- Manage symptomatically (there is little evidence for or against specific therapies).
- Close monitoring to detect any progression of neurology.
- Referral and investigation if progression of neurological deficits, intractable pain persists despite four to six weeks of conservative treatment.

Grade 4 Neck Pain

- Neck pain with symptoms or signs of major structural pathology.
- Referral or investigation dependent on the suspected underlying pathology.
- Failure to respond appropriately after four to six weeks requires reassessment and with appropriate investigation or referral.

(Bone and Joint Decade 2000-2010 Task Force)

2.10.2 Management

Management of non-specific neck pain can be challenging, more so if the patient is a chronic sufferer. The recommended choice of first line management depends solely on the illness' severity, the time interval, the functional limits and the clinician's specialities (Himmel *et al*. 2011). The recommendations made by the Bone and Joint Decade 2000-2010 Task Force on neck pain involves exercise training, manipulation, mobilisation, acupuncture, analgesics and low-level laser.

Acute non-specific neck pain can be treated by PRICES: Posture, Rest, Ice, Compression, Elevation and Support or Strapping (Evans 2014). Manual therapy has shown to be effective for patients in terms of a combination of manipulation and/or mobilisation that would include exercises such as stretches, targeting the appropriate muscles. The literature shows evidence that strengthening, stretching, proprioception and dynamic resistance exercises and traction serve to be very effective for acute and chronic non-specific neck pain. Further evidence shows that multidisciplinary and multimodal treatment, including different treatment modalities prove to be more effective. Some modalities that are included are the Transcutaneous Electric Nerve Stimulation (TENS) machine and Interferential Current (IFC). There is also evidence of successful treatment with the use of acupuncture in the specific trigger point and education about the correct ergonomics (Eyssen *et al.* 2009). Psychological intervention has also proved successful in chronic neck pain sufferers by promoting a positive outlook toward life activities and work activities.

A conventional approach can also be an option as various medication can be taken for the treatment of the neck pain. This medication includes NSAIDS which are muscle relaxants, local anaesthetic injections (lidocaine) which is injected into the specific trigger point or corticoid injections in the surrounding area of the nerve that assists with the radicular form of pain (Belgian Health Care Knowledge Centre 2009).

Prevention is the key to avoid reoccurrence:

- Proper lifting techniques: bend at the hips and waist.
- Spinal posture: good spinal posture during standing, sitting and sleeping.
- Daily exercise: with the use of stretches and strengthening techniques.
- Ergonomics: in terms of a good workspace.
- Good nutrition and maintaining a healthy weight.

- Stress management and relaxation techniques: use of yoga and meditation.
- Avoidance of smoking.

  (Mayfield Clinic 2013)

Table 2.2	Alternative and Complementary Medicine Treatment for Neck Pain	
Treatment	**Description**	**Evidence**
Spinal manipulation	Manual therapy designed to maximize painless movement, reduce muscle thightness, improve jont mobility, and correct alignment problems	Superior to no treatmenyt or sham treatment in the short term. Weak evidence for intermediate-term benefit and for superiority over pharmcotherapy and other alternative therapies
Acupuncture	Inserting needles into the skin at various anatomic locations to reduce pain or induce anesthesia. Needles may be manipulated manually or through electrical stimulation	Weak evidence that aupuncture is superior to no treatment in the short term. Strong evidence that acupuncture is not better than sham acunpuncture or other treatments
Massage therapy	The manipulation of muscle and connective tissue to enhance function and promote relaxation and well-being	Superior to no treatment or sham treatment but not more effective than otheractive treatments in the short term and intermediate term. No evidence for improved function.
Exercise therapy	Active or passive physical exercises designed to strenghten or stabilizethe spine that may reduce pain, prevent injuries, and improve posture and body mechanics	Strong evidence for intermediate-term relief for nonspecific neck pain and whiplash type injuries. Conflicting evidence for improvement of disability. No clear evidence supporting one technique over another or that exercise can prevent the developent of neck pain.
Traction	Procedures designed to relieve pressure on the spine	There is a low-quality evidence that traction is not superior to placebo treatments for neck pain with or without radiculopathy.
Soft cervical collar	Orthopedic device used to immobilize the neck and support the head and neck, often after injury	There is a low-quality evidence that a cervical collar is no more effective than physical therapy or other active therapies for cervical radioculopathy and whiplash
Electrotherapy	The use of elctrical energy as a medical treatment to relieve pain, usually by interfering with nerve conduction	There is low-quality evidence that various forms of electrotherapy (Eg transcutaneous electric nerve stimulation, pulsed electromagnetic field therapy) are better than placebo but not other treatments
Yoga	A series of physical, mental, and spiritual exercises designed to achieve a peaceful state of mind , improve conditioning, and attain self-actualization	Ther is weak evidence that yoga is more effective than home-based exercise treatment

Table 2.2 derived from Cohen (2015)

2.10 SUMMARY

The prevalence of non-specific neck pain has grown over the past decades and continues to grow with each passing day. It is considered a major concern in the health care sector. Factors such as biological, psychological and social are associated with neck pain, contributing greatly to the progression of the patient's pain. Studies have shown evidence that suggests treatment should target both the psychological and physical factors as individuals are exposed to greater stressors in life (Cassidy *et al.* 2000; Bago 2008; Cagnie *et al.* 2007). The biopsychosocial approach should be utilised as it encourages a multi-dimensional approach. A useful tool to determine the disability is the NDI and psychosocial factors the yellow flags form. These questionnaires serve as effective tools to evaluate the patient's outcome, response to the treatment and management of the patient (Vernon 1991; Liebenson 1996; Gretz *et al.* 2008).

CHAPTER THREE: MATERIALS AND METHODS

3.1 INTRODUCTION

The materials and methods in this chapter describe the design of the research project, the sample size used, and the measurement tools used in the study. It also describes the research process that was utilised for data collection and statistical analysis.

3.2 STUDY DESIGN

The design of the study was a quantitative paradigm, using a prospective, descriptive and survey based study. Permission from the Institutional Research and Ethics Committee (IREC) at Durban University of Technology (DUT) was granted to conduct this research study (ethics clearance certificate number: 006/17) (Appendix A).

3.3 STUDY POPULATION

Patients who suffer from neck pain presenting to the Durban University of Technology (DUT) Chiropractic Day Clinic (CDC) in the eThekwini Municipality.

3.4 SAMPLE SIZE

The response rate was 109 patients. There were 83 neck pain patients seen on average at the DUT CDC per month. All patients were invited to participate in the study.

3.5 SAMPLE CHARACTERISTICS

3.5.1 Inclusion criteria

3.5.1.1 All participants had to be over the age of 18 years and present their Identity Document or driver's license.

3.5.1.2 All participants that presented to the DUT CDC with non-specific neck pain.

3.5.1.3 All participants had to be attending the DUT CDC.

3.5.1.4 Participants who had presented to the DUT CDC on the very first visit with neck pain.

3.5.1.5 All participants signed a consent form prior to participation (Appendix I).

3.5.1.6 Any DUT student that presented to the DUT CDC with neck pain.

3.5.2 Exclusion criteria

3.5.2.1 Participants who were attending the DUT CDC but were involved in other research studies.

3.5.2.2 Participants who had other known specific pathology e.g. numbness and/or tingling down the arm due to trauma or surgery.

3.6 MEASUREMENT TOOLS

3.6.1 Neck Disability Index (NDI) (Appendix K)

The NDI (Vernon 1991) is aimed at identifying four dimensions of pain: dysfunction or disability; pain intensity; emotional and affective dimensions; and interference in life activities, therefore, it is a comprehensive tool of measurement (Gretz *et al.* 2008).

3.6.2 Yellow Flags Form (Appendix L)

Using a yellow flags questionnaire for screening purposes, it allows clinician to identify these psychosocial factors and the risk of disability affecting their patients. This allows

the clinician an opportunity to utilise a biopsychosocial approach when choosing a treatment protocol for the patients (Liebenson 1996).

3.6.3 A demographic and social factors questionnaire (Appendix J)

A demographic and social factors questionnaire was also included, as social factors also contribute to the chronicity of neck pain in terms of lifestyle habits and behaviours. The questionnaire included age, sex, level of education, living conditions, alcohol use, smoking status, levels of physical activity, physical work load and work satisfaction. The pre-validated questionnaire has been derived from Dyer (2012) who composed the questionnaire and who had completed her dissertation as a Master's student at DUT (permission has been granted and is seen in Appendix B).

3.7 RESEARCH RECRUITMENT AND PROCEDURE

Permission was obtained from the CDC Director to conduct the study at the DUT CDC (Appendix E) and once IREC approval was obtained, data collection commenced.

A meeting was held with the clinic reception staff informing them about the study and requesting their assistance. Permission was granted by the clinic reception staff and the signed documents were in the possession of the researcher. Initially the reception staff was responsible for the distribution of the research folder into the new patient's file at the first visit for a neck pain complaint. Secondly, they were responsible for removing the research folder once the patient's file was returned and placed it into the research box for collection by the researcher (Appendix G).

3.7.1 All questionnaires were printed by the researcher and separated into individual folders. These folders were kept in a separate research box in the DUT CDC administrative area.

3.7.2 When a new patient presented to the DUT CDC, the research folder, that consisted of the letter of information and informed consent, the consent form and questionnaires (Appendix H, I, J, K and L), was placed in the new file by the administrative staff.

3.7.3 Once the Master's student had completed the case history, they were able to determine whether the patient presented with non-specific neck pain.

3.7.4 The Master's student determined whether the patient met the inclusion criteria, (once the case history of the patient had been completed) and whether the patient was willing to participate in the study.

3.7.5 When the patient agreed to participate in the study, the Master's student presented him/her with a letter of information and confidentially (Appendix H), and informed consent (Appendix I). The patient was required to sign the informed consent.

3.7.6 The Master's student asked them a few questions that were recorded on a printed form and thereafter handed them the questionnaire to fill out while the Master's student left the room to consult with the clinician.

Screening questions	Answers
How old are you?	The patient is required to be over 18 years of age.
Where is your pain located?	Pain must be located by a horizontal line to the most inferior portion of the occipital region and a horizontal line through the spinous process of the first thoracic vertebra (Atamaz et al 2007).
Do you have a previous history of neurological involvement such as numbness and/or tingling in your arms?	Any indication of this will exclude the patient from the study, especially if the patient has had surgery.

Table 3.1 Screening Questions

3.7.7 Once the questionnaires (Appendix J, K and L) were filled out, they were placed back into the research folder and put back into the patient's file.

3.7.8 When the consult and treatment of the patient was over, the Master's student handed the file to the administrative staff. The administrative staff removed the research folder and separated the questionnaires (Appendix J, K and L), the letter of information (Appendix H) and the informed consent form (Appendix I) into separate boxes. This ensured confidentiality of the participants.

3.7.9 The questionnaires were collected and stored daily with the researcher.

NOTE:

- "Master's student" referred to all the interns in the CDC, as well as the researcher who assisted with the distribution of the questionnaire in the consultation room.

- Those patients who chose not to participate in the study or did not meet the inclusion criteria were not influenced or obliged to participate in any way.
- Those patients who gave informed consent to participate in the study and did meet the inclusion criteria did not have their standard treatment influenced by the research in any way.

3.8 DATA ANALYSIS

SPSS statistics were used to analyse the data accordingly. Descriptive statistics were used with the use of frequency tables, bar graphs and pie charts. Contingency tables were used to identify the association of the variables. When identifying the associations between the variables and Bivariate statistics were utilised in terms of Chi Square Test, Fisher's Exact Test and t-tests. Inferential statistics were used with a p value <0.05 (Singh 2016).

3.9 ETHICAL CONSIDERATION

3.9.1 The ethical principle of autonomy was maintained as all participants were given written informed consent and were free to decide whether they were willing to participate in the study or not.

3.9.2 The participants were made aware that they should have answered honestly. All the participants were informed that their personal information was confidential and once the research process was completed, the records were stored in the Chiropractic Department for a five-year period, whereafter it would be shredded and disposed of.

3.9.3 Those participants who chose not to participate were not negatively affected, nor were their treatment at the DUT CDC jeopardised, in line with the ethical principle of beneficence.

3.9.4 There was no influence on the treatment for any of the participants by the researcher, nor was any of the information used to influence the treatment of any participant. All treatments of the participants were in line with standard chiropractic treatment guidelines.

3.9.5 During the research process non-maleficence was upheld as no intentional harm was inflicted upon the patient.

3.10 LIMITATIONS

All the research participants were expected to be completely honest during the research process when answering the questionnaires. Unfortunately, there is no measurement tool for the extent of the participant's honesty and therefore all responses were taken into consideration and were included in this study.

CHAPTER FOUR: RESULTS

This chapter shows the results of the data collected from the questionnaires circulated for this study. It presents the demographic and psychosocial profile, as well as the pain and disability profile, and the yellow flags profile. It also shows the correlation between the above.

4.1 RESPONSE RATE

Of the 109 patients who were approached to participate in the study, all met the inclusion criteria and gave consent to participate. The 109 questionnaires were handed out to those participants and all 109 were answered and returned, giving a 100% response rate.

4.2 DEMOGRAPHIC PROFILE

4.2.1 Age, Gender and BMI

4.2.1.1 Age

Ages of the participants ranged from nineteen to eighty-one years. The mean recorded age of the study was 37.9 years. The standard deviation was 14.95. The mean recorded age of the study was 35. The IQR was 20-24.

Figure 4.1: Bar graph representing the age records (%)

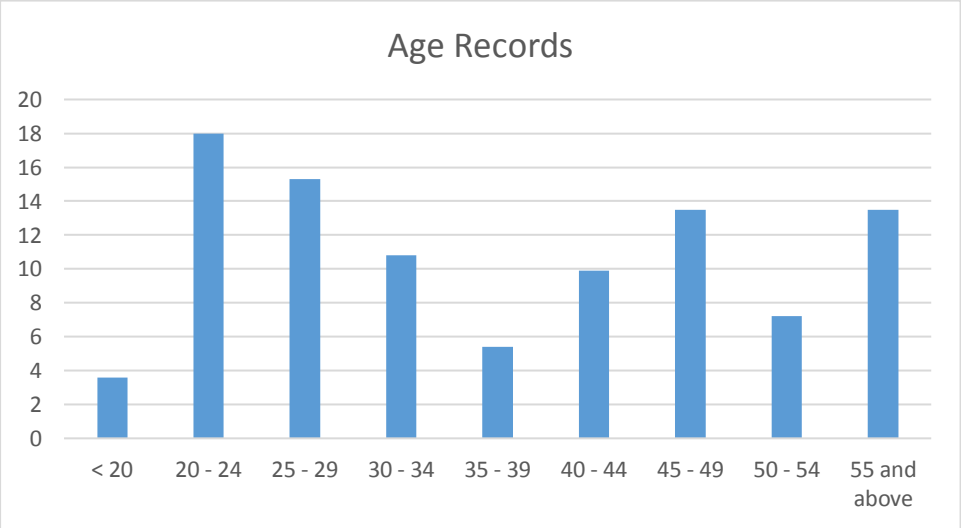


Figure 4.1 shows that out of the total participants (N=108), 3.6% (n=4) were aged below 20, 18% (n=20) were aged between 20-24 years, 15.3% (n=17) were aged between 25-29, 10.8% (n=12) were aged between 30-34, 5.4% (n=6) were aged between 35-39, 9.9% (n=11) were aged between 40-44, 13.5%(n=15) were aged between 45-49, 7.2%(n=8) were aged between 50-54 and the remainder 13.5% (n=15) were aged above 55 years. Majority of the participants were aged between 20-24 years.

4.2.1.2 Gender

Figure 4.2: Pie chart representing distribution between the genders (%).

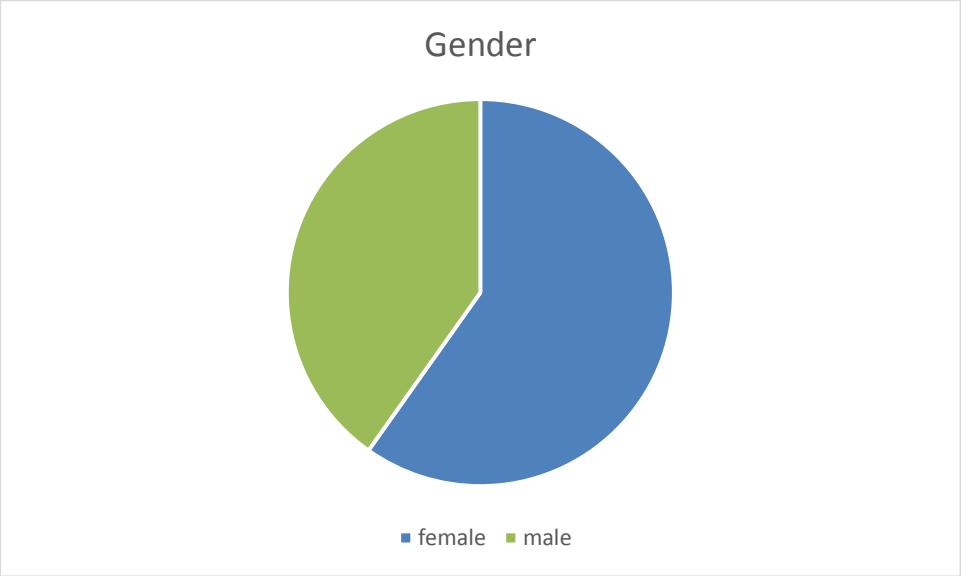


Figure 4.2 shows that 38.7% (n=43) of the participants were male and 57.7% (n=64) were female of the total participants who had NP (N=109). Hence, there was a greater percentage of female participants than male participants.

4.2.1.3 BMI

Figure 4.3: Bar graph representing the BMI record (%)

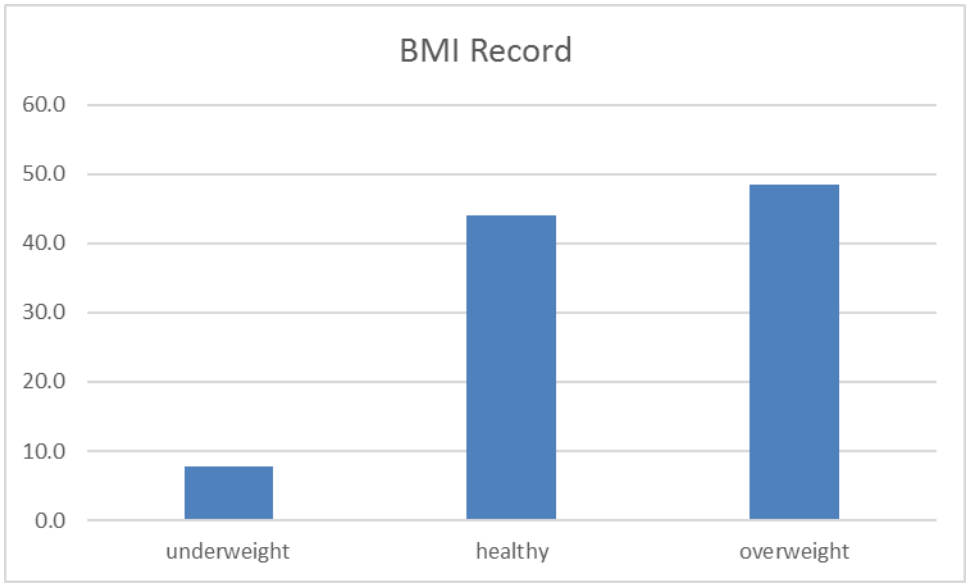


Figure 4.3 represents the BMI record of the overall population of the participants (N=91). Of the population 7.7% (n=4) were underweight, 44% (n=40) had a healthy weight and 48.4% (n=44) were overweight and obese. The mean BMI was 25 showing that most of the participants were overweight. The IQR was 6.

4.2.2 Level of education

Figure 4.4: Bar graph representing the highest level of education achieved by the participant (%)

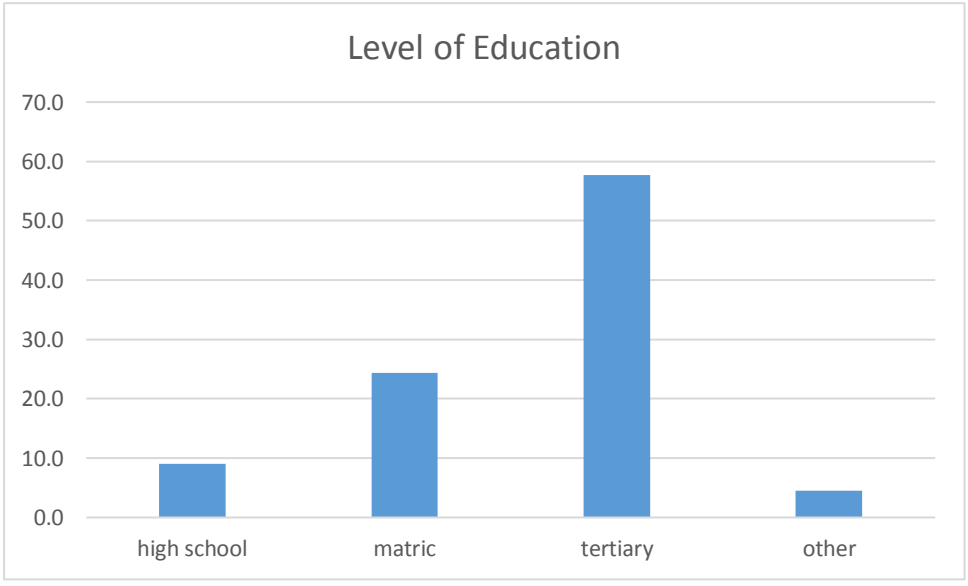


Figure 4.4 depicts the highest level attained by the total participants (N=109), with 57.7% (n=64) of the participants who were attaining and some of who had already attained some form of tertiary education, 9% (n=10) had attended high school, 24.3% (n=27) that completed matric and 4.5% (n=5) that obtained any other formal education. The majority of the participants attained a tertiary education.

4.2.3 Smoking and Alcohol Consumption

4.2.3.1 Smoking Status

Figure 4.5: Bar graph showing the participants smoking status (%)

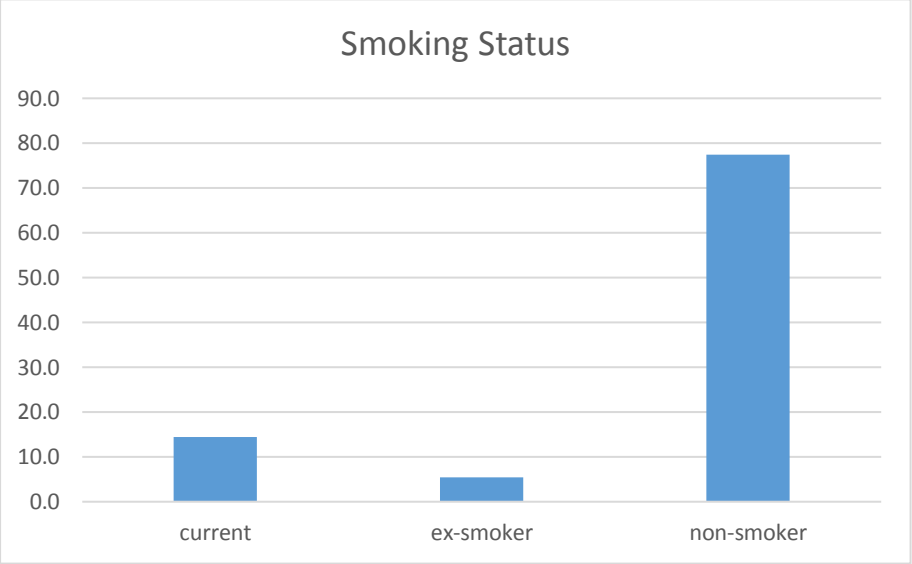


Figure 4.5 shows that out of the total participants (N=108), 77.5% (n=86) were non-smokers while 14.4% (n=16) were current smokers and 5.4% (n=6) were ex-smokers. Thus, the majority of participants did not smoke.

4.2.3.2 Alcohol Consumption

Figure 4.6: Pie charts representing whether the participants consumed alcohol or not (%)

Figure 4.6 shows results that depicts that out of the entire population of the participants (N=108), 58.6% (n=65) of the participants did not consume alcohol and 38.7% (n=43) did consume alcohol. This determines that the bulk of the participants did not consume alcohol.

Figure 4.7: Bar graph representing the amount of times alcohol was consumed weekly

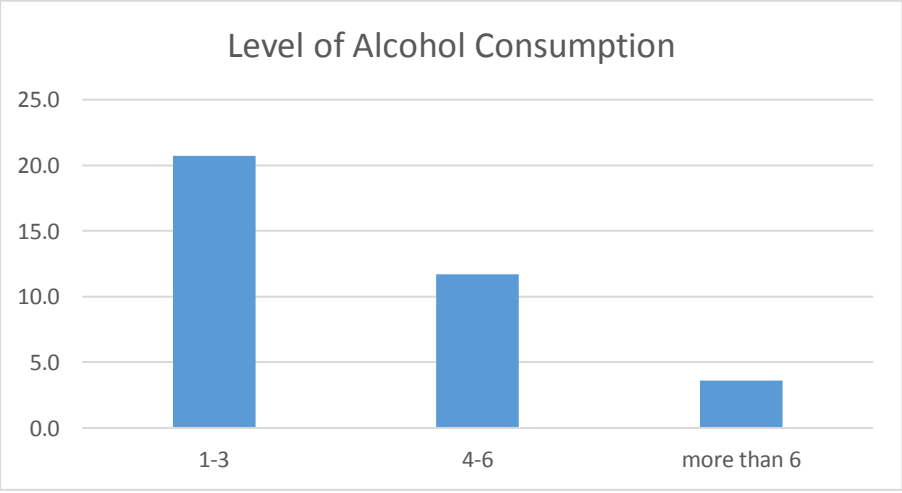


Figure 4.7 represents the results of the levels of alcohol consumption with those who consumed alcohol (N=40). 20.7% (n=23) consumed 1-3 drinks in a week, 11.7%

(n=13) consumed 4-6 drinks in a week and 3.6% (n=4) consumed more than 6 drinks in a week. The median recorded alcohol consumption of the study was 1. The IQR was 1.

4.2.4 Physical Activity

Figure 4.8: Pie chart showing the participants physical activity status

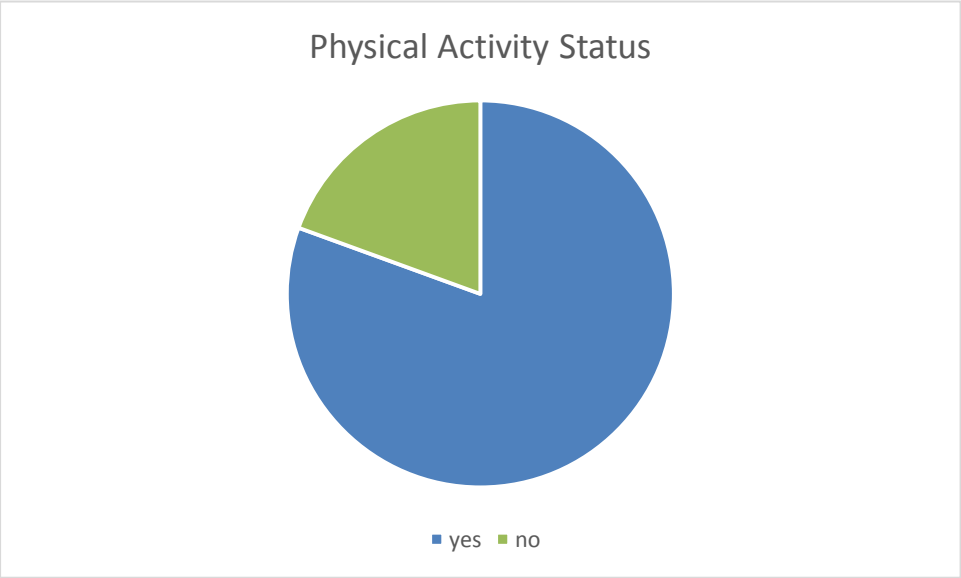


Figure 4.8 represents the number of participants who were physically active. Most of the participants (N=108) were active and partook in some form of physical exercise 78.4% (n=87), while 18.9% (n=21) did not engage in any physical activity. Of the different types of exercises (N=89), 18% (n=20) took part in cardio and 16.2% (n=18) in walking, making these the two most common forms of physical activity.

Figure 4.9: Bar graph representing the participants' physical activity at work (%)

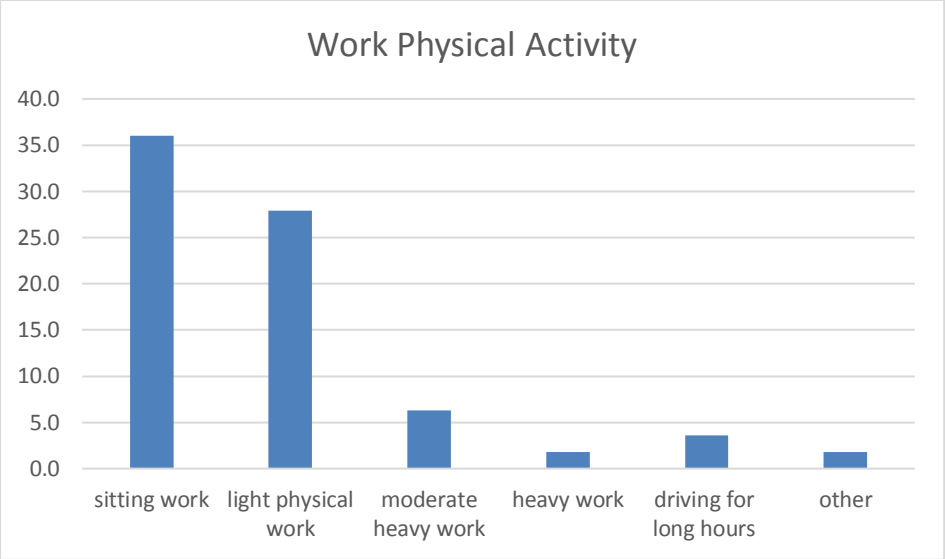


Figure 4.9 shows the participants (N=86) physical activity at work with 36% (n=40) involved in sitting work, 27.9% (n=31) involved in light physical activity, 6.3% (n=7) involved in moderate heavy work, 3.6% involved in driving for long hours and 1.8% (n=2) was other activities. More of the participants were involved in seated work as opposed to any other form of work activity.

4.2.5 Work Status

Figure 4.10: Bar graph representing the participants work status (%)

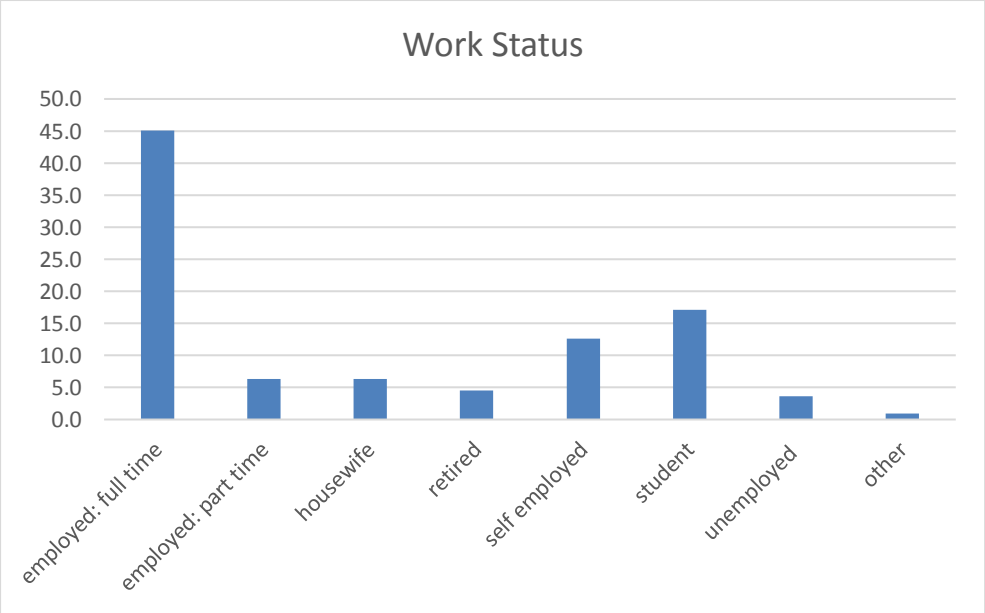


Figure 4.10 shows the different status of the total participants (N=107). 45% (n=50) were employed full time, 6.3% (n=7) who were employed part time, 6.3% (n=7) had been housewives, 4.5% (n=5) were retired, 12.6 (n=14) were self-employed, 17.1% (n=19) who were students, 3.6% (n=4) who were unemployed and 0.9% (n=1) who had other as a status. The majority of the participants were employed full time.

4.3 YELLOW FLAGS FORM

4.3.1 Pain Intensity

Figure 4.11: Bar graph representing the pain intensity according to a numeric scale

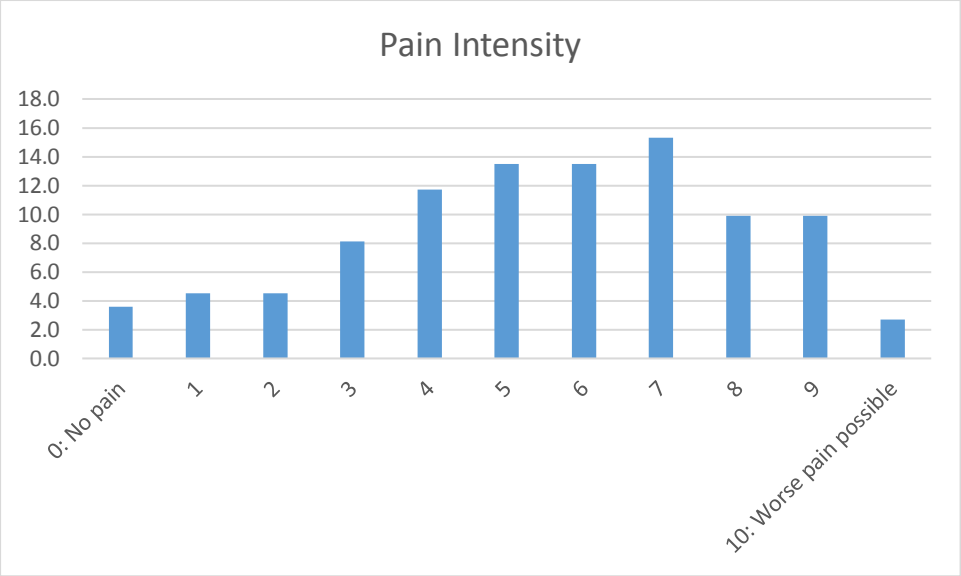


Figure 4.11 shows that majority of the participants rated 7 (15.3 %;n=17) as the worse intensity of pain experienced.

4.3.2 Pain to arm

Figure 4.12: Bar graph representing pain, numbness or weakness down the arm according to a numeric scale

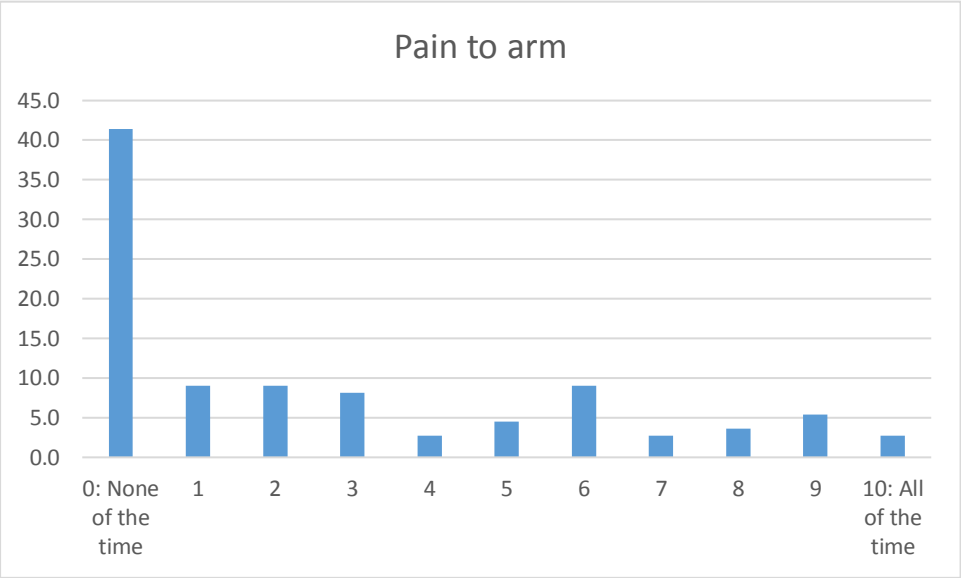


Figure 4.12 shows that majority of the participants (41.4%; n=46) did not experience any pain, numbness or tingling down the arm.

4.3.3 General health

Figure 4.13: Bar graph representing the participants' general health according to the numeric scale

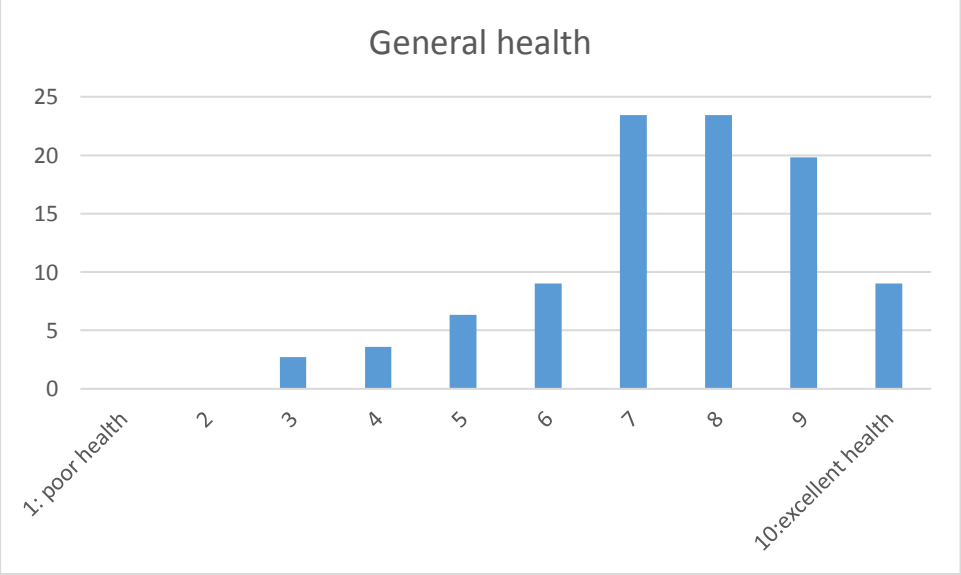


Figure 4.13 shows that a great amount of participants rated there general health at a high 7 (23,4%; 26) and 8 (23.4%;26) toward excellent health on the scale.

4.3.4 Feeling about the condition

Figure 4.14: Bar graph representing how the participants felt about the condition according to a numeric scale

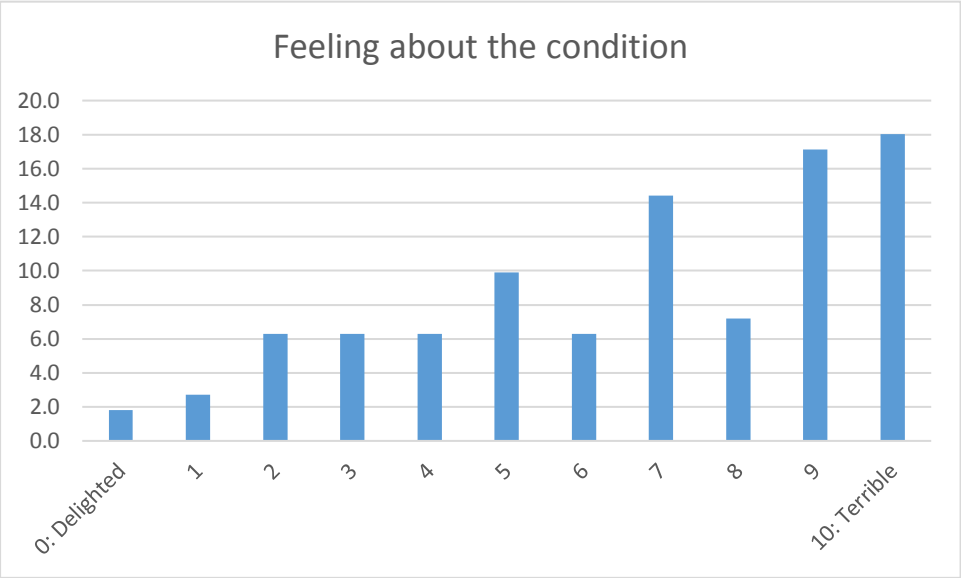


Figure 4.14 shows that majority of the participants felt terrible about there condition (18%; n=20)

4.3.5 Anxiety about the condition

Figure 4.15: Bar graph representing if the participants experienced any anxiety about the condition according to a numeric scale

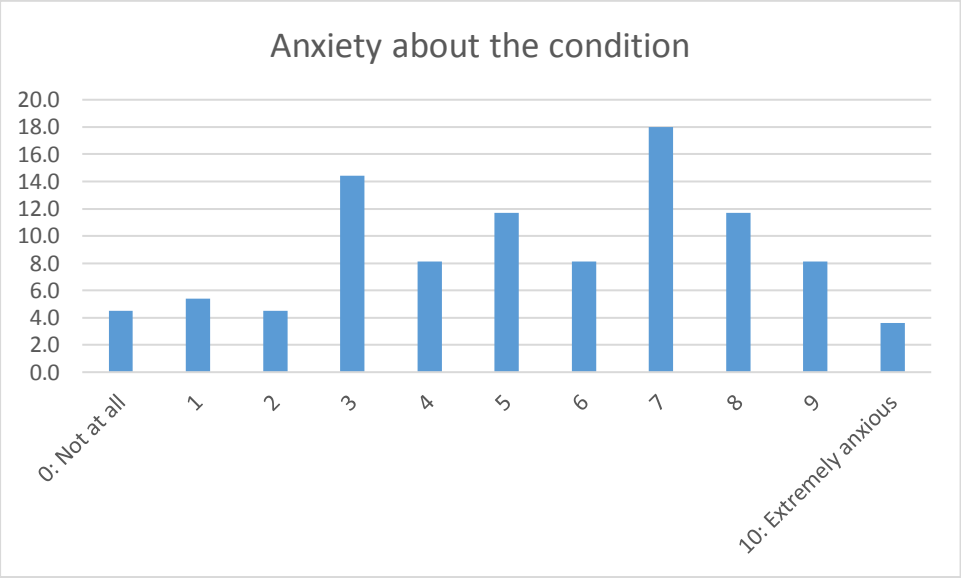


Figure 4.15 shows that majority of the participants rated their anxiety as 7 (18%; n=20) increasing towards extreme anxiety

4.3.6 Pain control

Figure 4.16: Bar graph representing pain control according to a numeric scale

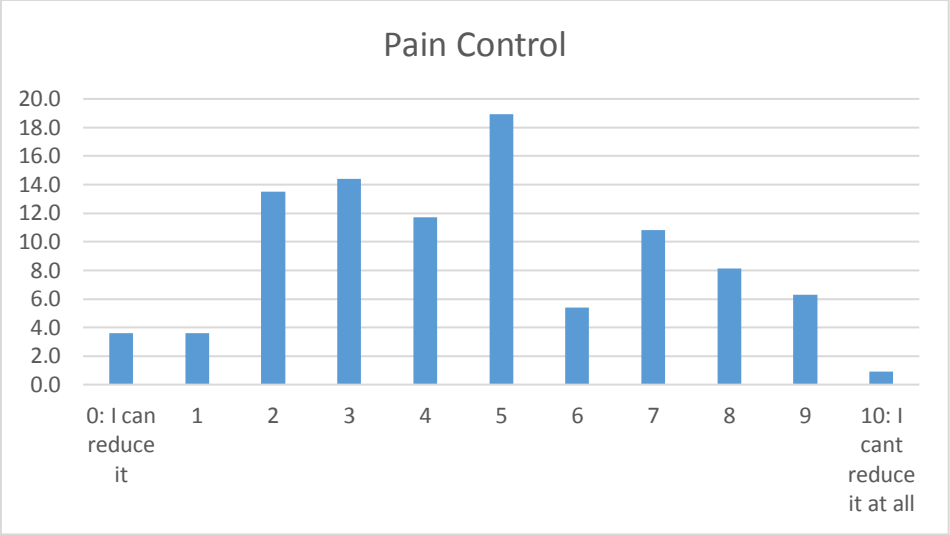


Figure 4.16 shows that majority of the participants rated pain control as a 5 (18.9%; n=21)

4.3.7 Level of depression

Figure 4.17: Bar graph representing the participants' depression according to a numeric scale

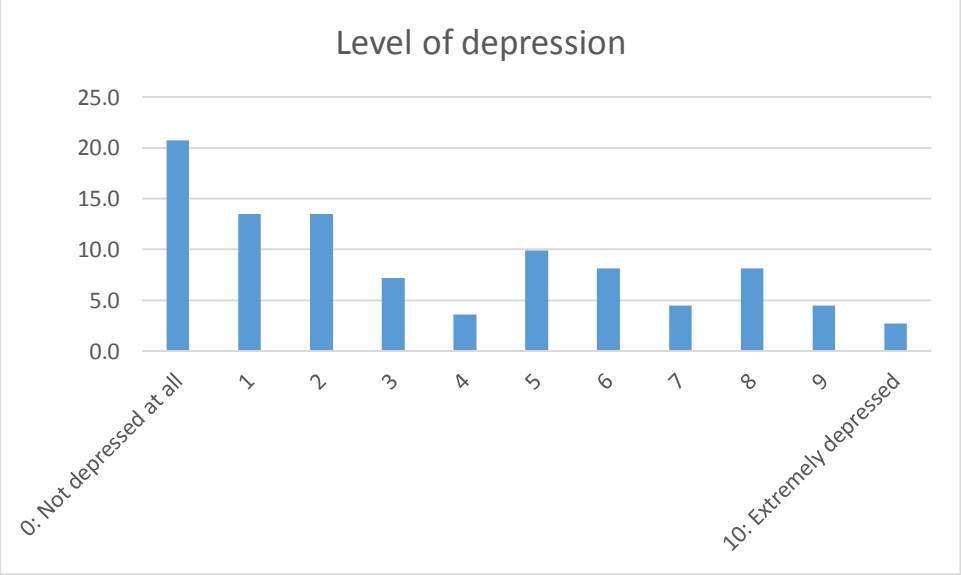


Figure 4.17 shows that majority of the participants were not depressed at all with their condition (20.7%; n=23)

4.3.8 Normal certainty of activities

Figure 4.18: Bar graph representing the participants' ability to carry out normal activities according to a numeric scale

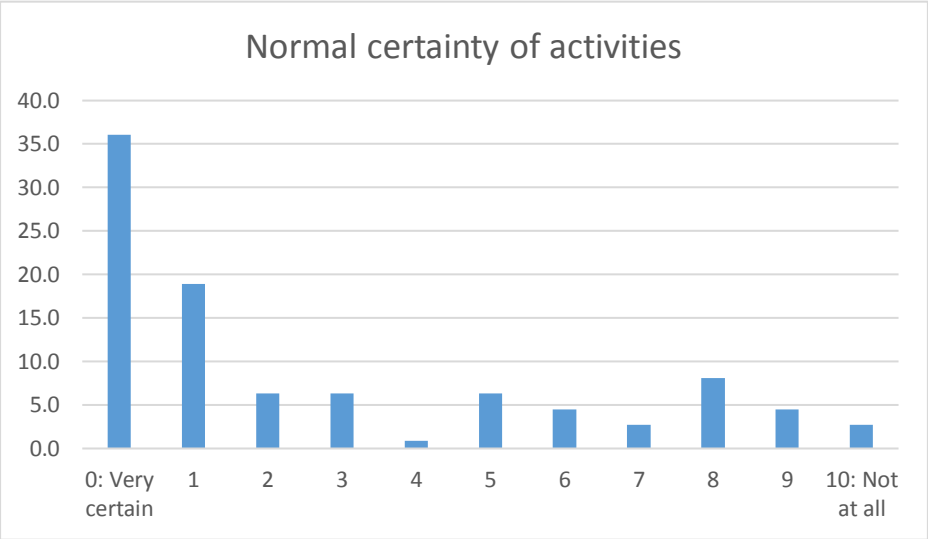


Figure 4.18 shows that majority of the participants were very certain that they could carry out normal activities (36%; n=40)

4.3.9 One hour light work

Figure 4.19: Bar graph representing if the participants were able to perform one hour of light work according to a numeric scale

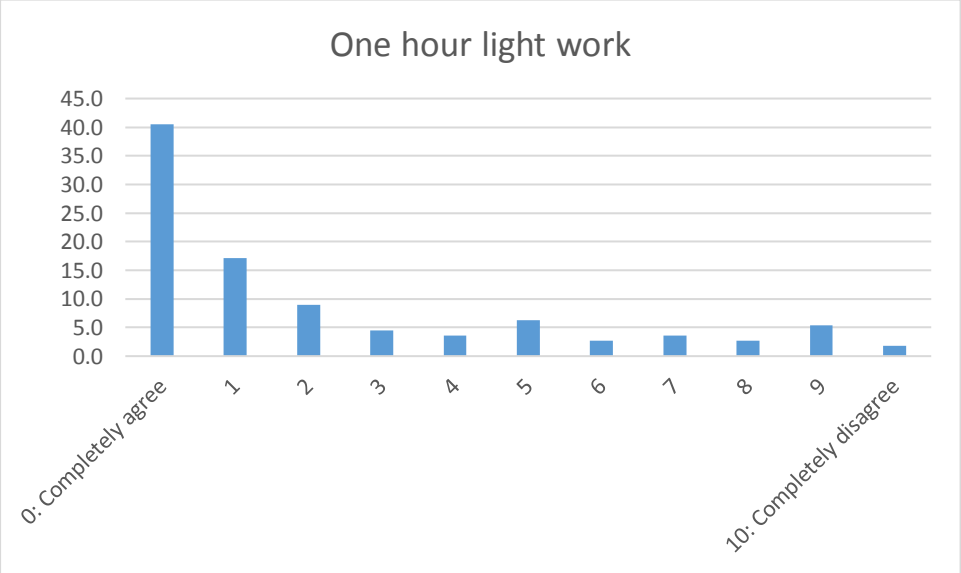


Figure 4.19 represents that the majority of the participants completely agreed to being able to perform one hour of light work (40.5%; n=45)

4.3.10 Sleep at night

Figure 4.20: Bar graph to represent the whether, the participants were able to sleep at night according to a numeric scale

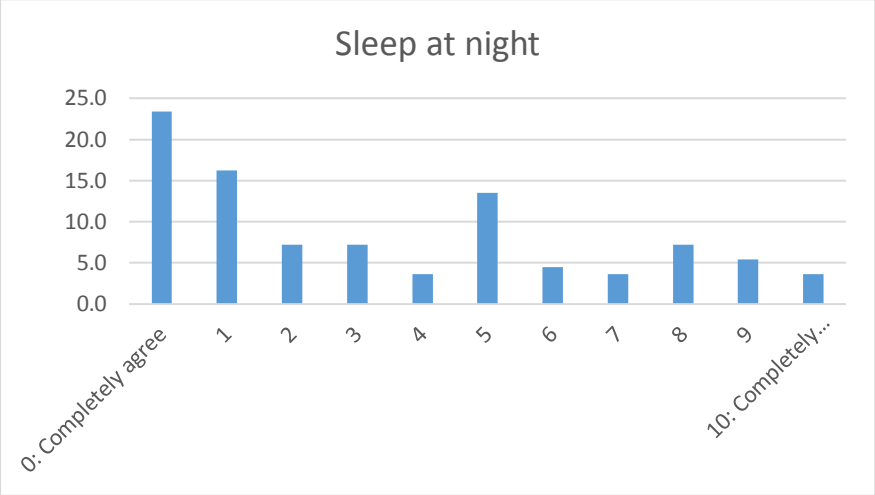


Figure 4.20 shows that majority of the participants completely agreed to sleeping at night (23.4%; n=26)

4.3.11 Physical activity makes pain worse

Figure 4.21: Bar graph representing if physical activity made pain worse according to a numeric scale

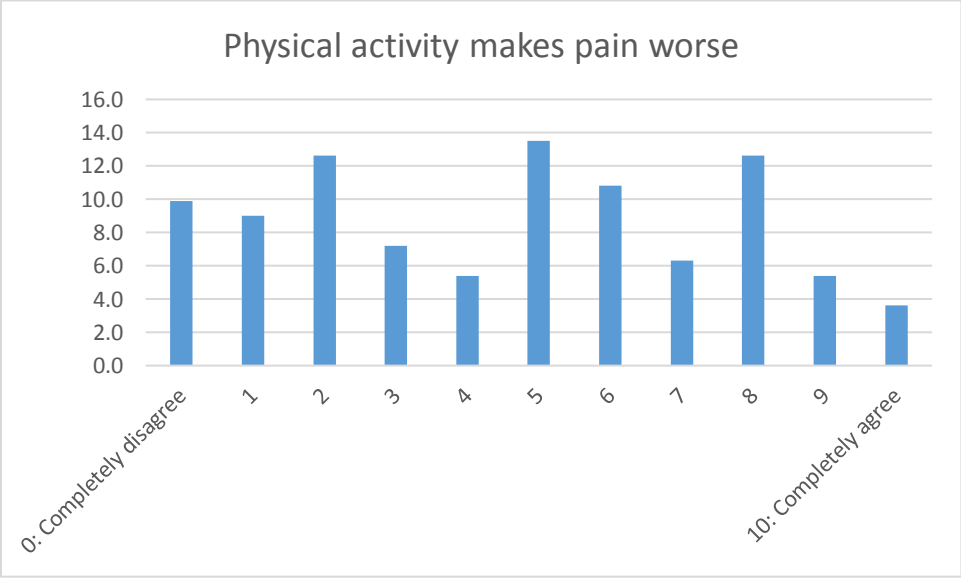


Figure 4.21 shows that majority of the participants rated 5 (13.5%; n=15) on the scale which is midway between agreeing and disagreeing

4.3.11 Restriction to present pain

Figure 4.22: Bar graph representing if the participants had any restriction due to the pain according to a numeric scale

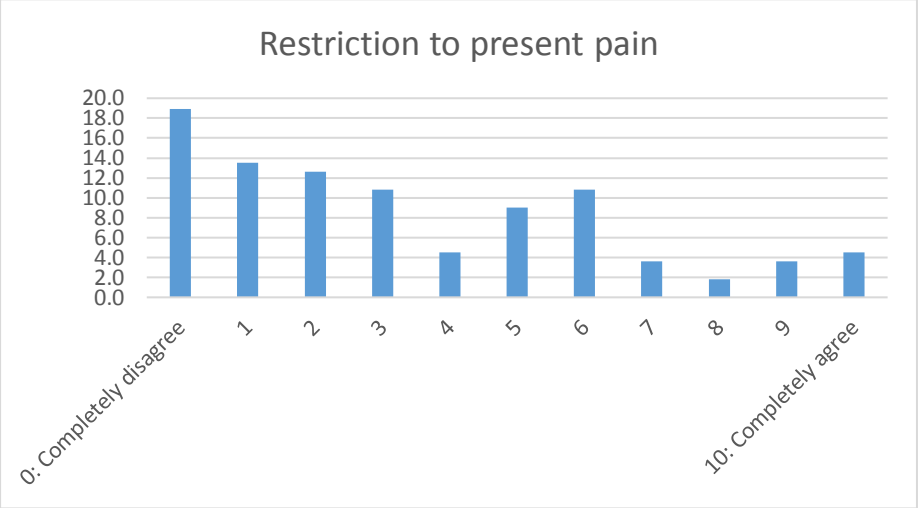


Figure 4.22 shows that majority of the participants completely disagreed to the restriction due to their present pain (18.9%, n=21)

The yellow flags form adds up the scores of each category and rates the participant in terms of low, medium and high risk of disability. 4.4.3 shows the correlation between the NDI and the yellow flags form.

4.3 PSYCHOSOCIAL PROFILE

Psychosocial profile comprises the work satisfaction of the participants and the risk of chronicity and disability.

4.4.1 Work Satisfaction

Figure 4.23: Bar graph representing work satisfaction (%)

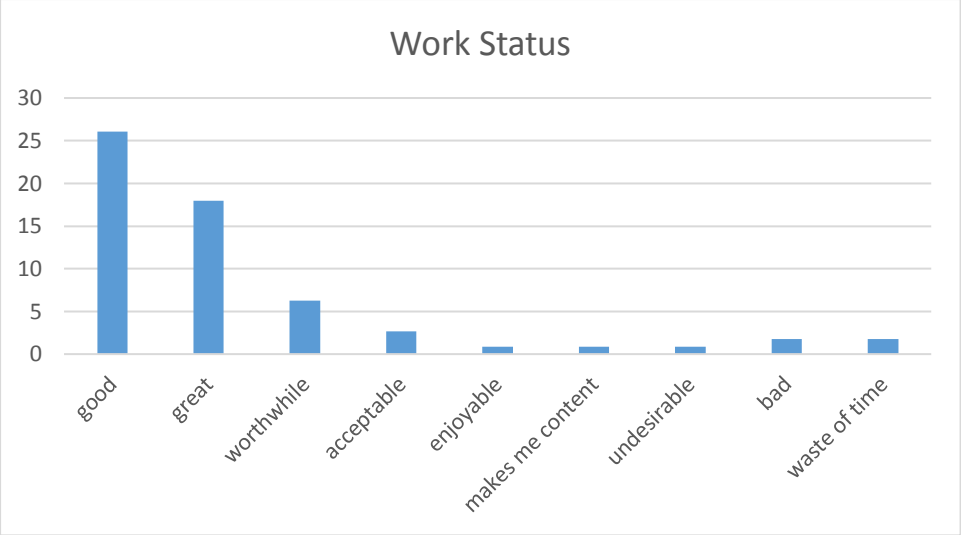


Figure 4.23 represent the total participants (N=66). The graph shows that 26.1% (n=29) had good work satisfaction, 18% (n=20) had great, 6.3% (n=7) found their work to be acceptable, 0.9% (n=1) found their work enjoyable, 0.9% (n=1) found that their work made them feel content, 0.9% (n=1) had undesirable work, 1.8% (n=2) had bad work satisfaction and 1.8% (n=2) thought that their work was a waste of time. The data shows that most of the participants had good and great work satisfaction.

4.4.2 Risk of Chronicity and Disability

Figure 4.24: Bar graph presenting the risk of Chronicity and Disability (%)

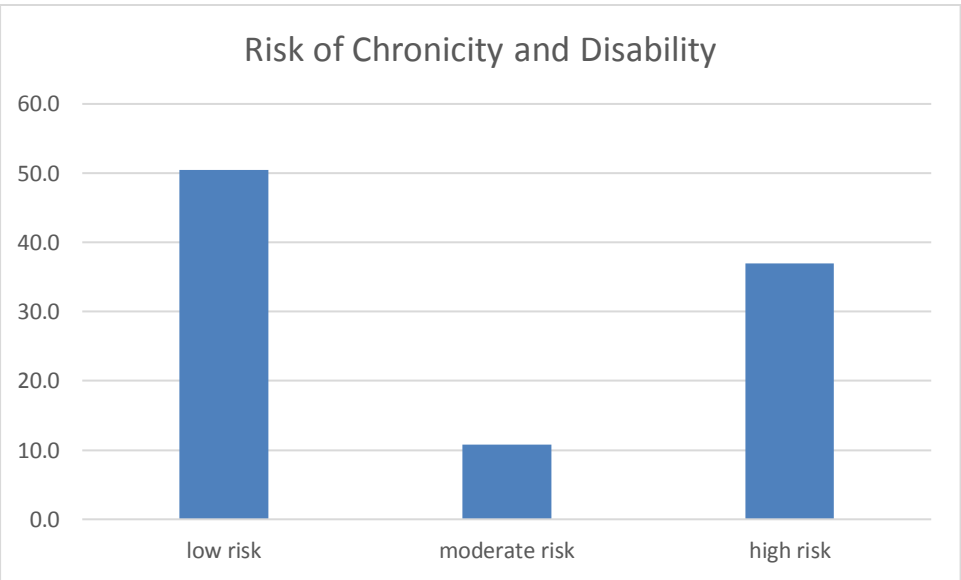


Figure 4.24 shows that of those participants (N=109), 50.5% (n=56) had a low risk of chronicity and disability, 10.8% (n=12) had a moderate risk and 36.9% (n=41) had a high risk.

4.4.3 Spearman Correlation of the psychosocial factors and the risk of chronicity

In assessing the relationship between variables, the below benchmarks were used to establish the strength of relationships (M. N. K. Saunders & Bezzina, 2015). The following ranges for the coefficient of correlation were used:

- Range one: -1.0 to -0.7 strong negative relationships
- Range two: -0.7 to -0.3 weak negative relationships
- Range three: -0.3 to +0.3 little or no relationship
- Range four: +0.3 to +0.7 weak positive relationships
- Range five: +0.7 to +1.0 strong positive relationships

Correlations

			neck disability index score (%)	Numericriskofchronicity
Spearman's rho	neck disability index score (%)	Correlation Coefficient	1.000	.552**
		Sig. (2-tailed)	.	.000
		N	109	109
	Numericriskofchronicity (yellow flags)	Correlation Coefficient	.552**	1.000
		Sig. (2-tailed)	.000	.
		N	109	109

**. Correlation is significant at the 0.01 level (2-tailed).

-

This shows a moderate relationship between NDI and risk of chronicity from the yellow flags form. In other words, if the NDI score is high, then the risk of chronicity is also going to be high risk. This shows that both psychosocial questionnaires are proportional to each other.

4.4 ASSOCIATION BETWEEN DEMOGRAPHIC AND THE RISK OF CHRONICITY

Table 4.1: This shows the cross tabs in terms of chronicity and the risk for chronic neck pain.

Factors		Risk of chronic neck pain		
		Low (%)	Moderate (%)	High (%)
Age group	25 and below	62.1	58.1	41.7
	26-40	6.9	16.1	10.4
	greater than 40	31	25.8	47.9
Gender	Male	65.1	7	27.9
	Female	43.8	14.1	42.2
BMI	Underweight	57.1	14.3	28.6
	Healthy weight	57.5	15.0	27.5
	Overweight and obese	47.7	9.1	43.2
Level of education	Tertiary level	50	14.1	35.9
	Below tertiary level	52.4	7.1	40.5
Smoker	Yes	37.5	6.3	56.3
	No	53.3	12	34.8
Alcohol consumption	Yes	55.8	7	37.2
	No	49.2	13.8	36.9
Physical Activity	Yes	54	12.6	33.3
	No	38.1	4.8	57.1
Work Status	Employed	49.1	10.5	40.4
	Student	68.4	10.5	21.1
	At home	41.9	21.1	45.2

Odds ratios (OR) were calculated to ascertain the measure of association between a risk factor and an outcome. The OR represents the odds of an outcome given a particular risk factor, compared to the odds of the outcome occurring in the absence of that risk factor (Szumilas 2010).

4.5.1 Age

The ages of the respondents range from nineteen to eighty-one years. Results show that at the age of 25 and below there was a 61.1% low risk of chronicity, a 6.9% moderate risk of chronicity and a 31.0% high risk of chronicity. Between the ages of 26-40, it was shown that there is a 58.1% low risk of chronicity, a 16.1% risk of moderate chronicity and a 25.8% risk of high chronicity. For the ages greater than 40 years, there was a 51.9% risk of low chronicity, an 11.1% risk of moderate chronicity and a 37.0% risk of high chronicity. There was an association between age and risk of chronicity, with the older participants having a higher risk chronicity compared the younger participants, but this was not statistically significant. This is because although the odds of having moderate to high risk of chronicity was twice that for older than younger participants, thus finding was not statistically significant (OR 1.957, 95% CI: 0.910 - 4.207; p = 0.0857).

Table 4.2: Table depicting the results of the relationship of the risk of chronicity and the age differences.

OddsRecodeAge * OddsRecodeChronicity Crosstabulation

			OddsRecodeChronicity		
			Moderate to High Risk of Chronicity Outcome	Low Risk of Chronicity Outcome	Total
OddsRecodeAge	Exposure: Above 35	Count	30_a	23_a	53
		% within OddsRecodeAge	56.6%	43.4%	100.0%
	Control: 35 and below	Count	22_a	33_a	55
		% within OddsRecodeAge	40.0%	60.0%	100.0%
Total		Count	52	56	108
		% within OddsRecodeAge	48.1%	51.9%	100.0%

Each subscript letter denotes a subset of OddsRecodeChronicity categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.980[a]	1	.084		
Continuity Correction[b]	2.353	1	.125		
Likelihood Ratio	2.994	1	.084		
Fisher's Exact Test				.123	.062
Linear-by-Linear Association	2.953	1	.086		
N of Valid Cases	108				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 25.52.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for OddsRecodeAge (Exposure: Above 35 / Control: 35 and below)	1.957	.910	4.207
For cohort OddsRecodeChronicity = Moderate to High Risk of Chronicity Outcome	1.415	.948	2.112
For cohort OddsRecodeChronicity = Low Risk of Chronicity Outcome	.723	.497	1.053
N of Valid Cases	108		

The odds of having moderate to high risk of chronicity are 2 times greater for older participants when compared to younger participants (OR 1.957, 95% CI: 0.910 - 4.207; $p = 0.0857$)

Results

Odds ratio	1.9565
95 % CI:	0.9099 to 4.2070
z statistic	1.718
Significance level	P = 0.0857

4.5.2 Gender

Table 4.1 had a total of N=64 female participants at risk of chronicity. Of those participants 43.8% (n=28) were low risk participants, 14.1% (n=9) were moderate risk participants and 42.2% (n=27) were high-risk participants. There was a total of N=43 male participants at risk of chronicity. 65.1% (n=28) were low risk participants, 7% (n=3) were moderate risk participants and 27.9% (n=12) were high-risk participants. This data concludes that female patients are at a higher risk of NP chronicity than males. The OR with this one was statistically significant as both the lower and upper Cis are >1.

Table 4.3: Table presents the association between the risk of chronicity and gender.

OddsRecodeGender * OddsRecodeChronicity Crosstabulation

			OddsRecodeChronicity		
			Moderate to High Risk of Chronicity Outcome	Low Risk of Chronicity Outcome	Total
OddsRecodeGender	Exposure: Female	Count	36_a	28_b	64
		% within OddsRecodeGender	56.3%	43.8%	100.0%
	Control: Male	Count	15_a	28_b	43
		% within OddsRecodeGender	34.9%	65.1%	100.0%
Total		Count	51	56	107
		% within OddsRecodeGender	47.7%	52.3%	100.0%

Each subscript letter denotes a subset of OddsRecodeChronicity categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.707[a]	1	.030		
Continuity Correction[b]	3.889	1	.049		
Likelihood Ratio	4.761	1	.029		
Fisher's Exact Test				.048	.024
Linear-by-Linear Association	4.663	1	.031		
N of Valid Cases	107				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 20.50.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for OddsRecodeGender (Exposure: Female / Control: Male)	2.400	1.080	5.332
For cohort OddsRecodeChronicity = Moderate to High Risk of Chronicity Outcome	1.613	1.016	2.559
For cohort OddsRecodeChronicity = Low Risk of Chronicity Outcome	.672	.472	.957
N of Valid Cases	107		

The odds of having moderate to high risk of chronicity are 2.4 times greater for female participants when compared to male participants (OR 2.4, 95% CI: 1.080 - 5.332; p = 0.0316)

Results

Odds ratio	2.4000
95 % CI:	1.0803 to 5.3320
z statistic	2.150
Significance level	P = 0.0316

4.5.3 BMI

Table 4.1 represents the relationship between the risk of chronicity and the BMI records. Of the participants (N=38) with a BMI below 24.9, 55.3% (n=21) had a low risk of chronicity, 15.8% (n=6) had a moderate risk of chronicity and 28.9% (n=11) had a high risk. Those participants (N=31) who had a BMI between 25-29 had a 54.8% (n=17) low risk of chronicity, 9.7% (n=3) had a moderate risk and 35.5% (n=11) had a high risk of chronicity. From those participants (N=22) that had a BMI of 30 and above, 45.5% (n=10) had a low risk of chronicity, 9.1% (n=2) had a moderate risk and 45.5% (n=10) had a high risk. These results show that the BMI findings were inconclusive in identifying those at risk of NP.

Table 4.4: Table representing the relationship between the risk of chronicity and BMI records

OddsRecodeBMI * OddsRecodeChronicity Crosstabulation

			OddsRecodeChronicity		
			Moderate to High Risk of Chronicity Outcome	Low Risk of Chronicity Outcome	Total
OddsRecodeBMI	Exposure: Above 25	Count	23_a	21_a	44
		% within OddsRecodeBMI	52.3%	47.7%	100.0%
	Control: 25 and below	Count	20_a	27_a	47
		% within OddsRecodeBMI	42.6%	57.4%	100.0%
Total		Count	43	48	91
		% within OddsRecodeBMI	47.3%	52.7%	100.0%

Each subscript letter denotes a subset of OddsRecodeChronicity categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.861[a]	1	.353		
Continuity Correction[b]	.516	1	.473		
Likelihood Ratio	.863	1	.353		
Fisher's Exact Test				.404	.236
Linear-by-Linear Association	.852	1	.356		
N of Valid Cases	91				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 20.79.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for OddsRecodeBMI (Exposure: Above 25 / Control: 25 and below)	1.479	.647	3.381
For cohort OddsRecodeChronicity = Moderate to High Risk of Chronicity Outcome	1.228	.794	1.900
For cohort OddsRecodeChronicity = Low Risk of Chronicity Outcome	.831	.560	1.233
N of Valid Cases	91		

The odds of having moderate to high risk of chronicity are 1.5 times greater for overweight and obese participants when compared to healthy participants (OR 1.5% CI: 0.647 - 3.381; *p* = 0.3541)

Results

Odds ratio	1.4786
95 % CI:	0.6465 to 3.3815
z statistic	0.927
Significance level	P = 0.3541

4.5.4 Level of Education

Table 4.1 presents the association between the level of education and the risk of chronicity. Half of the NP participants (N=64) who attained a tertiary education had a low risk of chronicity, 14.1% (n=9) had a moderate risk and 35.9% (n=23) had a high risk. Of those participants (N=42) who attained anything below a tertiary education, 52.4% (n=22) had a low risk of chronicity, while 7.1% (n=3) had a moderate risk and 40.5% (n=17) had a high risk. These results show that there is no significant association between the risk of chronicity and education status.

Table 4.5: Association between the risk of chronicity and the level of education

OddsRecodeEducation * OddsRecodeChronicity Crosstabulation

			OddsRecodeChronicity		
			Moderate to High Risk of Chronicity Outcome	Low Risk of Chronicity Outcome	Total
OddsRecodeEducation	Exposure: Below Tertiary Level	Count	20_a	22_a	42
		% within OddsRecodeEducation	47.6%	52.4%	100.0%
	Control: Tertiary Level and Above	Count	32_a	32_a	64
		% within OddsRecodeEducation	50.0%	50.0%	100.0%
Total		Count	52	54	106
		% within OddsRecodeEducation	49.1%	50.9%	100.0%

Each subscript letter denotes a subset of OddsRecodeChronicity categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.058[a]	1	.810		
Continuity Correction[b]	.002	1	.967		
Likelihood Ratio	.058	1	.810		
Fisher's Exact Test				.845	.484
Linear-by-Linear Association	.057	1	.811		
N of Valid Cases	106				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 20.60.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for OddsRecodeEducation (Exposure: Below Tertiary Level / Control: Tertiary Level and Above)	.909	.417	1.981
For cohort OddsRecodeChronicity = Moderate to High Risk of Chronicity Outcome	.952	.638	1.422
For cohort OddsRecodeChronicity = Low Risk of Chronicity Outcome	1.048	.718	1.529
N of Valid Cases	106		

The odds of having moderate to high risk of chronicity are 1 times greater for participants with below tertiary level education when compared to participants with tertiary level or above levels of education (OR 1% CI: 0.417 - 1.981; *p* = 0.8105)

Results

Odds ratio	0.9091
95 % CI:	0.4172 to 1.9811
z statistic	0.240
Significance level	P = 0.8105

4.5.5 Smoking and Alcohol Consumption

4.5.5.1 Smoking

Table 4.1 shows the association between the risk of chronicity and the smoking status and its influence on NP. There is a significant relationship between smoking and the risk of chronicity as the participants who were smokers (N=16) had a 56.3% (n=9) higher risk of chronicity, with 6.3% (n=1) at moderate risk of chronicity and 37.5% (n=6) at low risk. Non-smokers (N=92) had a 53.3% (n=49) lower risk of developing chronicity with NP. 12% (n=11) of the non-smoking participants had a moderate risk of chronicity, while 34.8% (n=32) of non-smokers had a high risk of developing chronicity. There was an association between smokers and risk of chronicity, with the participants who smoked having a higher risk chronicity compared the non-smoking participants, but this was not statistically significant according to the odds (p=0.2 (<0.05)).

Table 4.6: Table showing the association between the risk of chronicity and smoking status

OddsRecodeSmoking * OddsRecodeChronicity Crosstabulation

			OddsRecodeChronicity		
			Moderate to High Risk of Chronicity Outcome	Low Risk of Chronicity Outcome	Total
OddsRecodeSmoking	Exposure: Smoker	Count	10_a	6_a	16
		% within OddsRecodeSmoking	62.5%	37.5%	100.0%
	Control: Non Smoker	Count	43_a	49_a	92
		% within OddsRecodeSmoking	46.7%	53.3%	100.0%
Total		Count	53	55	108
		% within OddsRecodeSmoking	49.1%	50.9%	100.0%

Each subscript letter denotes a subset of OddsRecodeChronicity categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.355[a]	1	.244		
Continuity Correction[b]	.797	1	.372		
Likelihood Ratio	1.365	1	.243		
Fisher's Exact Test				.287	.186
Linear-by-Linear Association	1.342	1	.247		
N of Valid Cases	108				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.85.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for OddsRecodeSmoking (Exposure: Smoker / Control: Non Smoker)	1.899	.637	5.659
For cohort OddsRecodeChronicity = Moderate to High Risk of Chronicity Outcome	1.337	.863	2.072
For cohort OddsRecodeChronicity = Low Risk of Chronicity Outcome	.704	.364	1.363
N of Valid Cases	108		

The odds of having moderate to high risk of chronicity are 1.9 times greater for smokers when compared to non-smokers (OR 1.899, 95% CI: 0.637 - 5.659; *p* = 0.2495)

4.5.5.2 Alcohol Consumption

Table 4.1 presents the relationship between the risk of chronicity and alcohol. The data shows that out of the total participants (N=43) who did consume alcohol, 55.8% (n=24) were at low risk of chronicity, 7% (n=3) were at moderate risk and 37.2% (n=16) were at high risk. For those participants (n=65) who did not consume alcohol, 49.2% (n=32) had a low risk of chronicity, while 13.8% (n=9) had a moderate risk and 36.9% (n=24) had a high risk of chronicity. The results show no significant relationship between chronicity of NP and either those patients who consumed alcohol, or those who did not consume alcohol. There was also no statistically significance p=0.05 and CI cross 1.

Table 4.7: Table presenting the relationship between the risk of chronicity and alcohol consumption

OddsRecodeAlcohol * OddsRecodeChronicity Crosstabulation

			OddsRecodeChronicity		
			Moderate to High Risk of Chronicity Outcome	Low Risk of Chronicity Outcome	Total
OddsRecodeAlcohol	Exposure: Regular Alcohol Consumption	Count	19_a	24_a	43
		% within OddsRecodeAlcohol	44.2%	55.8%	100.0%
	Control: No Alcohol Consumption	Count	33_a	32_a	65
		% within OddsRecodeAlcohol	50.8%	49.2%	100.0%
Total		Count	52	56	108
		% within OddsRecodeAlcohol	48.1%	51.9%	100.0%

Each subscript letter denotes a subset of OddsRecodeChronicity categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.449[a]	1	.503		
Continuity Correction[b]	.224	1	.636		
Likelihood Ratio	.450	1	.502		
Fisher's Exact Test				.558	.318
Linear-by-Linear Association	.445	1	.505		
N of Valid Cases	108				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 20.70.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for OddsRecodeAlcohol (Exposure: Regular Alcohol Consumption / Control: No Alcohol Consumption)	.768	.354	1.664
For cohort OddsRecodeChronicity = Moderate to High Risk of Chronicity Outcome	.870	.576	1.315
For cohort OddsRecodeChronicity = Low Risk of Chronicity Outcome	1.134	.789	1.630
N of Valid Cases	108		

The odds of having moderate to high risk of chronicity are 0.8 times greater for participants who consume alcohol regularly when compared to participants who don't consume alcohol (OR 0.768, 95% CI: 0.354 - 1.664; *p* = 0.5030)

Results

Odds ratio	0.7677
95 % CI:	0.3541 to 1.6643
z statistic	0.670
Significance level	P = 0.5030

4.5.6 Physical Activity

Table 4.1 shows that out of the total participants who exercised (N=82), 54% (n=11) were at a low risk of chronicity, 12.6% (n=11) were at a moderate risk of chronicity and 33.3 % (n=29) were at a high risk of chronicity. Of the total participants who did not exercise (N=21), 38.1% (n=8) were at a low risk of chronicity, 4.8% (n=1) were at a moderate risk of chronicity and 38% (n=41) were at a high risk of chronicity. Participants who did not exercise were 90% more likely to develop chronicity, but this is not statistically significant (OR 1.909, 95% CI: 0.719 - 5.069; p = 0.1942).

Table 4.8: Table represents the relationship between physical activity and the risk of developing chronicity

OddsRecodeExercise * OddsRecodeChronicity Crosstabulation

			OddsRecodeChronicity		
			Moderate to High Risk of Chronicity Outcome	Low Risk of Chronicity Outcome	Total
OddsRecodeExercise	Exposure: No Regular Exercise	Count	13_a	8_a	21
		% within OddsRecodeExercise	61.9%	38.1%	100.0%
	Control: Regular Exercise	Count	40_a	47_a	87
		% within OddsRecodeExercise	46.0%	54.0%	100.0%
Total		Count	53	55	108
		% within OddsRecodeExercise	49.1%	50.9%	100.0%

Each subscript letter denotes a subset of OddsRecodeChronicity categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.717[a]	1	.190		
Continuity Correction[b]	1.139	1	.286		
Likelihood Ratio	1.729	1	.189		
Fisher's Exact Test				.229	.143
Linear-by-Linear Association	1.701	1	.192		
N of Valid Cases	108				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.31.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for OddsRecodeExercise (Exposure: No Regular Exercise / Control: Regular Exercise)	1.909	.719	5.069
For cohort OddsRecodeChronicity = Moderate to High Risk of Chronicity Outcome	1.346	.898	2.020
For cohort OddsRecodeChronicity = Low Risk of Chronicity Outcome	.705	.395	1.258
N of Valid Cases	108		

The odds of having moderate to high risk of chronicity are 1.9 times greater for participants who don't exercise when compared to participants who exercise regularly (OR 1.909, 95% CI: 0.719 - 5.069; *p* = 0.1942)

Results

Odds ratio	1.9094
95 % CI:	0.7191 to 5.0695
z statistic	1.298
Significance level	P = 0.1942

4.5.7 Work Status

Table 4.1 depicts the relationship between the risk of chronicity and the work status of the participants. Of those participants who were employed (N=57), 49.1% (n=28) had a low risk of chronicity, 10.5% (n=6) had a moderate risk and 40.4% (n=23) had a high risk. Among the participants who were students (N=19), 68.4% (n=13) had a low risk of chronicity, 10.5% (n=2) had a moderate risk and 21.1% (n=4) had a high risk of chronicity. Of the participants (N=31) who stayed at home, 41.9% (n=13) had a low risk of chronicity, 12.9% (n=4) were at moderate risk and 45.2% (n=14) had a high risk. The evidence reveals that those participants who lived a sedentary lifestyle at home were at higher risk of developing NP. Participants who lived a sedentary lifestyle were 12% more likely to develop NP but this was not statistically significant (OR 1.122, 95% CI: 0.525 - 2.399; p = 0.7665).

Table 4.9: Table represents the relationship between the risk of chronicity and work status

OddsRecodeWorkStatus * OddsRecodeChronicity Crosstabulation

			OddsRecodeChronicity		
			Moderate to High Risk of Chronicity Outcome	Low Risk of Chronicity Outcome	Total
OddsRecodeWorkStatus	Exposure: Employed	Count	29_a	28_a	57
		% within OddsRecodeWorkStatus	50.9%	49.1%	100.0%
	Control: Student or At Home	Count	24_a	26_a	50
		% within OddsRecodeWorkStatus	48.0%	52.0%	100.0%
Total		Count	53	54	107
		% within OddsRecodeWorkStatus	49.5%	50.5%	100.0%

Each subscript letter denotes a subset of OddsRecodeChronicity categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.088[a]	1	.766		
Continuity Correction[b]	.011	1	.918		
Likelihood Ratio	.088	1	.766		
Fisher's Exact Test				.847	.459
Linear-by-Linear Association	.087	1	.768		
N of Valid Cases	107				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 24.77.

b. Computed only for a 2x2 table

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for OddsRecodeWorkStatus (Exposure: Employed / Control: Student or At Home)	1.122	.525	2.399
For cohort OddsRecodeChronicity = Moderate to High Risk of Chronicity Outcome	1.060	.721	1.558
For cohort OddsRecodeChronicity = Low Risk of Chronicity Outcome	.945	.649	1.375
N of Valid Cases	107		

The odds of having moderate to high risk of chronicity are 1.1 times greater for either fully or part-time employed participants when compared to participants who were students or at home (OR 1.122, 95% CI: 0.525 - 2.399; *p* = 0.7665)

Results

Odds ratio	1.1220
95 % CI:	0.5248 to 2.3990
z statistic	0.297
Significance level	P = 0.7665

CHAPTER FIVE: DISCUSSION

This chapter interprets the results obtained and finds the associations between this study and previous studies done prior to this. Included in this chapter are the demographic findings, psychosocial findings and the relationship between the two.

5.1 RESPONSE RATE

The total sample size used for this study was 109 patients from the DUT CDC. All 109 patients who were approached to participate in the study, met the inclusion criteria and gave consent. The 109 questionnaires were handed out to those participants and all 109 were answered and returned, giving a 100% response rate.

5.2 DEMOGRAPHIC PROFILE

5.2.1 Age

As found by Lal (2008) found that participants between the ages of 44-46 experienced the greatest percentage of NP, 64.5% to be exact. Another study carried out by Holtermann *et al.* (2011) illustrated that the mean active female participants were 45.9 years of age and the mean active male participants were 45.2 years of age. In keeping with the evidence, those who were older than 40 years had 47.9% of a high risk of chronicity and those who were 25 and below had 30% of a high risk of chronicity. The mean age of the participants recorded for this study was 37.9 years with a standard deviation of 14.9. The ages of the participants spanned from 19 to 81 years. Evidence reveals that older women are at a higher risk of developing chronic NP (Christensen *et al*. 2006). Other evidence displays information that the categories of 50 and over showed a higher prevalence of NP as opposed to those who were younger (Asghari 2011).

Majority of the above information is comparable to the results found in this study. In terms of this study, all the participants were recruited from the DUT CDC and most of the participants were employed individuals. This can be due to the DUT CDC being situated in close proximity to the university. A study conducted by McDonald (2011)

takes into consideration that the mean age of participants at the clinic is generally lower than that of those in international private clinics. Steven (2015) seems to have a difference of opinion when it comes to the frequency of the age of the participant and NP, as it is still being debated whether NP generally occurs during middle age or not. In this study the mean age of participants experiencing NP was 37.9 years of age, which is regarded as middle age.

Generally, there is a higher risk of developing chronic pain among the elderly, causing them to become more severely disabled (van Heck *et al*. 2013). The evidence from this study is consistent with the data as the odd ratio shows that older people are two times more prone to suffer from chronic NP as opposed to younger individuals. This therefore coincides that older participants are twice as likely to suffer from chronic NP.

5.2.2 Gender

As found in a longitudinal study of the general population who had risk factors for neck pain, who showed that there was a larger group of female (n=996) participants than males (n=712) (Croft *et al*. 2001). *Cagnie et al* (2007) reported that of a total of 512 respondents, 225 were females (41.7%) and 287 of them were males (58.3%). In a Saskatchewan study focussing on factors associated with neck pain and its disability, also reveals that most of the 1131 participants were females (53.4%) (Carroll *et al*. 2000). A study in Norway found that 64.3% of females experienced NP and 46.1% of males experienced NP (Lal 2008). Another study shows that a Norwegian population shows an occurrence of 29% in males and 40% in females (Ariens *et al.* 2000). This is further supported by evidence found in an Australian population that showed 11% in males and 13.5% in females (Ashghari 2001). In Hong Kong there was a prevalence of 15% (n=78) in males and 15% in females (Chiu *et al*. 2004). In a Spanish population there is a frequency of 77.8% in females (Bago *et al*. 2008). As found in the above studies, our study found that majority of females, 57.7% (n=64) experienced NP as opposed to males, 38.7% (n=43).A cohort study shows that 73.3% of the participants were female, while 26.3% were male participants (Janwamtanakul *et al*. 2011).

In South Africa (SA) there is a higher ratio of females to male, approximately 51% of the population are female (Statistics South Africa 2014). From the results of numerous studies, one can determine that there is generally a higher percentage of female

participants than male participants. Females are more at risk of the development of the chronicity of NP due to lifestyle factors, cultural and physical differences (Guez *et al*. 2002; van Heck *et al.* 2013). Evidence from a Swedish study shows that females are supposedly more likely to experience perceived stress rather than males. This in turn causes females to be more prone to chronicity as increased stress level acts as contributor to the NP chronicity (Grimby-Ekman 2010). Another reason could be that females are prone to degenerative disc disease as opposed to men and this contributes to the chronicity of NP, as females are most likely to be treated for chronic pain (Raghavendra and Holtheman 2016).

With this being said, evidence reiterates that the female ratio and prevalence of NP is more dominant in the female population (Alves *et al.* 2015). This is consistent with Steven and Cohen (2015) who suggest that females are more prone and are at higher risk of suffering from NP. Eloff's (2016) findings further highlight that of the patients presenting to the DUT CDC of both 35.6% (n=26) of males and 64.4% (n=47) of females, again females prove to be at a higher risk than males. All this evidence corresponds with this study showing that 42.2% of females were at a high risk of developing chronicity, while only 27.9% of the males were at a high risk of chronicity. Females were significantly more likely, 2.4 times more likely to develop chronic NP than males.

5.2.3 BMI

The BMI ranged from 16 to 46 kg/m² with a mean of 25 kg/m² and a IQR=6. The majority of the participants were classified as being overweight with a percentage of 48.4%, 44% were considered within a healthy weight and 7.7% were considered to be underweight. This conincides with Bongers *et al* (2013) that showed NP was experienced by approximately 30% of those participants that were within normal weight, 29.7% of those who were overweight and 33% of those who were obese. Another study conducted by Abreu et al (2013) displayed results showing that 22.6% were not overweight and 29.6% were overweight/obese. Cassidy *et al* (2000) also shows that 24.7% were underweight, 24.8% were a healthy weight, 25.2% were overweight and 25.3% were obese. The data in this study displayed that 48.4% of

those who were overweight and obese, 44% were of a healthy weight and 7.7 were underweight.

This shows that BMI does not affect one's predisposition for NP. Abreu et al (2013) and Cassidy et al (2000) agreed that BMI does not influence the development of NP as there is little or no substantial evidence linking the factors, further supporting this statement.(Bongers *et al*. 2013) reiterates the above by stating that there is no link between musculoskeletal symptoms like neck pain and BMI.

5.2.4 Level of Education

Of the participants in this study 57.7% had already obtained some form of tertiary education, 24.3% had matriculated, 9% had attended high school and 4.5% had not achieved any formal education. A study conducted in Norway showed that most of the population attended secondary school with 28.6% who were male and 34.9% who were female (Lal 2008). According to a study conducted by Alves *et al* (2015) about 0.5% (n=2) had no education, 26.6 % (n=106) did not complete high school, 49.8% (n=198) completed high school and 23.1% (n=92) completed college.

Unlike the other studies mentioned, many of the participants from this study attained some form of tertiary education. According to Statistics South Africa (2014), there has been an increase of 6% in the population attending matric and 4% gaining a form of tertiary education. Another factor that showed why the majority of the participants were students was because of the location of the DUT CDC, which is surrounded by a student population attending DUT to complete some form of tertiary education. Many of the chiropractic students could have recruited peers and friends to attend the CDC with some form of NP in this case. Participants of a higher education also tend to understand and interpret their pain more effectively and this does influence the treatment that they seek, in this case the chiropractic treatment for their NP (Lal 2008). Most of these individuals experience stressful lifestyles that do contribute to NP.

According to evidence found, individuals from an underprivileged background were more at risk of developing NP. This coincides with the odds ratio of this study whereby individuals with no tertiary education were at 1% higher risk of developing chronicity as opposed to those who already had or was in the process of obtaining a tertiary

education. It showed that those who have a tertiary education level were more likely to have a positive response to recovery than those who were not as educated (Pai and Pai 2016). A systemic study conducted by van Heck *et al* (2013) presented evidence stating the development of chronicity is inversely proportional to socioeconomic status. This ties into the evidence found in this study.

5.2.5 Smoking and Alcohol Consumption

As found in Allison's study (2002) 78.5% did not smoke and 21.5% were current smokers and H¨akk¨anen *et al* (2003) study that revealed 23.8 were smokers, 17.4% were ex-smokers and 58.9% did not smoke at all. This study determined that out of the total population, 77.5% were non-smokers, 14.4% were current smokers and 5.4% were ex-smokers. Smoking can cause up 30% of the past year or lifetime's chronic NP (Zvolensky *et al*. 2009). Depending on the age and frequency of cigarettes smoked a day over the period that the smoker/ex-smoker smokes, it can provoke disc herniation through violent coughing, or cause pathological changes in the IVD because of alterations of nutrition, PH levels or mineral content with in the disc (Coggon *et al*. 2003). It can influence hormonal function, as it indirectly affects the vitamin D absorption, intestinal calcium absorption and affects the vessels and oxygen supply (Abate *et al.* 2013). This can result in osteoporotic changes in the bones of the neck resulting in NP. This is further substantiated by a study conducted by Coggan *et al* (2003) that represents evidence of the relationship between smoking and regional musculoskeletal pain stating that there is a consistent association between them. Smokers experience a higher intensity of pain and by reducing the number of cigarettes smoked in a day, the individual experiences less pain (Kaye and Ochsner 2012). In this study the majority of the participants were non-smokers.

According to Coggen *et al* (2003), current and ex-smokers show a greater risk of developing chronicity of NP. This was in keeping with the data attained from this study whereby current smokers were at a higher risk of developing chronicity as opposed to non-smokers. Smokers were at a 56.3% greater risk than the non-smokers. Smoking has been shown to occur more frequently in those participants who experience pain, further emphasizing the relationship between chronicity of pain and smoking (van Heck *et al*. 2013). A review article also emphasizes that smokers need to avoid

smoking as smoking contributes to the prevalence of NP and other musculoskeletal disorders, causing it to become chronic (Abate *et al.* 2013). This study further highlights that smokers are at a higher risk of developing chronic NP as opposed to those non-smokers.

From the study, 58.6% of the participants did not consume alcohol and 38.7% did consume alcohol. A study conducted by Allison (2002) showed that 40.8% consumed alcohol, while 59.2% did not. Another study showed that 5.5% excessively consumed alcohol 35% consumed a moderate amount of alcohol and 59.5% did not consume alcohol (H¨akk¨anen *et al.* 2003). According to WHO (2014), about 70% of the population aged 15 and older did consume alcohol. Ditre *et al* (2015) stated that pain and alcohol are both highly prevalent and co-exist in the general population. The above findings do not correlate much with this particular study, as a substantial number of the participants did not consume alcohol.

Alcohol has shown to have addictive tendencies, and this can result in chronic pain although it has not been shown to be a contributor to NP (Ferreira *et al*. 2013). This evidence is in keeping with the results of this study that shows no significant relationship between those patients who consumed alcohol and those that did not with relation to the chronicity of NP.

5.2.6 Physical Activity

Studies conducted by Brekke and Hjortdahl and Kvien (2002) showed that 64.8% of the participants from the east and 79.3% of participants from the west partook in physical activity at least once or more in a week, while another study conducted by Bongers *et al* (2013) supported the finding showing that 52.5% of the participants engaged in physical activity. Daneels *et al* (2007) study showed that the minority in a chronic NP study, 38.65%, partook in some form of exercise. The results from this study showed that 78.4% of the participants were active and partook in some form of physical activity while 18.9% did not participate in any form of physical activity. The most common forms of physical activities by the participants were 18% did cardio and 16.2% partook in walking.

According to the research, the different forms of exercise and the hours engaged in exercise vary amongst the different studies. Exercise plays a vital role in the management of NP and the prevention of NP as little or more physical activity has shown to be beneficial to NP (World Health Organisation 2010). In this particular study, cardio and walking were the most common forms of activity.

According to the World Health Organisation (2010), physical activity is vital for mental and physical health and is recommended for improving and maintaining overall musculoskeletal fitness. In this study, 57.1% of the participants were at an increased risk of developing chronicity due to no exercise, while 54% were at a low risk of chronicity as they participated in some form of exercise. Therefore, showing that those participants who exercised were at a lower risk of developing chronicity, while those participants who did not exercise were at a higher risk of developing chronicity.

5.2.7 Work Status and Physical Activity

About 63.9 % of the participants in this study were either full time, or part time employees or self-employed, 17.1% of them were students and the remainder (4.5%) had unemployed as a work status.

Studies conducted by H¨akk¨anen *et al* (2003) showed 34% had work related variables, with 29% being physical work, Baptista *et al* (2013) showed that 15.9% were involved in light activity, 11.7% were involved in moderate activity and 0.7% were involved in intense activity, and Ahlberg *et al* (2002) sitting for more than 95% of a working day is a risk factor for NP. Results from this study found that out of the total population of participants, 36% were involved in sitting work, 27.9% were involved in light physical activity, 6.3% involved in moderate heavy work, 3.6% involved in driving for long hours and 1.8% were involved in other activities

Hagberg *et al* (2004) stated that those in a work environment were at a higher risk of developing NP. This statement corresponds with a study conducted by Pai and Pai (2016) who also found that a sitting occupation had an increased risk of developing chronicity of NP. A systemic review reveals that unsatisfactory job control can become an occupational influence on the chronicity of pain (van Heck *et al*. 2013). According to this study evidence revealed that, those participants who engaged in a sedentary

lifestyle were more at risk of developing chronicity of NP. This correlates with a study conducted by Pai and Pai (2016) who revealed that participants with a sitting/sedentary job were more at risk of developing chronic NP.

5.3 PSYCHOSOCIAL PROFILE

With the use of the NDI and yellow flags form, the psychosocial profile results were derived.

5.3.1 Work Satisfaction

In this study 26.1% of the population stated that their work was good and 18% found their work great, showing that majority of the participants were satisfied with their jobs. A study conducted by Collins *et al* (2011) states that various research studies show that there is a correlation between NP and job satisfaction. Other studies show that poor support and involvement from supervisors/colleges contribute to musculoskeletal conditions such as NP (Chen *et al*. 2005). Another study shows that 76% of the participants were very satisfied/rather satisfied with their jobs, with 24% being neutral/rather/very dissatisfied (Ha¨kka¨nen *et al*. 2003). The data collected from these previous studies are congruent with the evidence gained in this particular study.

Job satisfaction can be of a complex nature, therefore, there can be various responses in terms of the participant's perception of their work. This makes it a challenge when measuring satisfaction in a work environment as the participants may be satisfied with certain factors and not with others (Ratinaud *et al*. 2013). In this particular study an unexpected percentage of the participants suffering from NP were satisfied with their jobs and the work it entailed. This could be due to the limitations of measuring job satisfaction because of its complex nature. In terms of NP many individuals who are dissatisfied or are under strain generally suffer from stress and tension and this in turn affects the neck as the muscles and ligaments take strain.

5.3.2 Risk of Chronicity (NDI and Yellow Flags Form)

Ferrari and Russels (2003) stated that there is a relationship between psychosocial factors and the risk of chronicity. Linton (2000) stated there was a psychosocial link

between the acute to chronic pain disability and that of psychosocial factors and the development of non-specific NP. The fear avoidance of pain model ties in where by an individual can be afraid of pain, therefore causing a fear of movement and work-related activities, as this may result in re-injury. This re-injury results in chronicity as the patient continues to suffer with their NP as it progresses. A study conducted by Pai and Pai (2016) showed that psychosocial factors were huge contributors to produce and prolong disability, increasing the risk of NP chronicity.

From this particular study, 36.9% of the participants were at a high risk of chronicity according to the NDI and 37% of the participants were at a high risk of chronicity according to the yellow flags form. In this study it shows a moderate relationship between NDI and risk of disability from the yellow flags form. In other words, if the NDI score is high, then the risk of disability is also going to be high risk.

Both these tools' results correlate with each other, showing that this percentage of the participants is at risk of chronicity and disability. With the use of spearmans correlation, this concludes that there is a psychosocial risk related to these participants NP.

CHAPTER SIX: CONCLUSION

6.1 CONCLUSION

The population of 109 participants attended the DUT CDC with complaints of non-specific NP over a four-month period. The participants were aged between eighteen and eighty-one years. Majority of the participants were females and they were 2.4 times more likely to suffer from chronic NP. Gender was the most significant demographic in this study. The BMI values showed that most of the participants were overweight and obese, although BMI did not affect chronic NP. From the total participants a great majority gained or was in the process of attaining a tertiary education making them less likely to suffer from chronic NP. Non-smokers and non-drinkers formed the majority in this study. The smokers and ex-smoker were at a risk high risk of chronicity, although there were limitations as statistically it was insignificant. The majority of participants engaged in some form of exercise, which decreased their risk of developing NP chronicity, even though they were limitations with statistical significance. Fully employed participants were the largest category in terms of work status. The employed participants were mainly involved in sitting as the most common type of work, or light physical work.

The population of participants in this study presented to the DUT CDC with non-specific NP over a four-month period. Majority of these participants were satisfied with their work and rated it as good as the most common option, with the option great following. The participants who were at a low risk of developing NP due to psychosocial factors, were the largest sub-group in this study and those who had a high risk of chronicity were the smaller sub-group. Even though the minority group were at a higher risk of chronicity, 36.9% were at risk according to the NDI and yellow flags form. The spearmans correlation between the NDI and yellow flags form showed that if the score was high on the questionnaires, the risk for chronicity will be high which in turn makes the individual more prone to disability.

BMI, level of education, alcohol consumption and work satisfaction were shown to be insignificant in relation to the risk of chronicity of NP.

The results from this particular study conducted at the DUT CDC can be compared to other chiropractic clinic patients worldwide. It supports that there are correlations of

NP to the adverse psychosocial factors with the increases risk of chronic NP. Categorising patients into distinct categories allows more effective and specialised treatment protocols.

6.2 RECOMMENDATIONS

Since NP is of multifactorial origin, future studies should focus on determining other risk factors with significance to be investigated. E.g. researching psychosocial risk factors of NP in males versus those in females. Additional research can investigate psychosocial risks of those patients presenting to the DUT CDC as opposed to those in private practice. Another recommendation can look at patients who repeatedly return for treatment, whether they are at risk for chronic NP compared to what was found in this study. A bigger sample size for any future study could result in clearer, more significant statistics and benefit the study.

References

Abate, M., Pentalane, A., Salini, V., and Vanni, D.2013.Review Article: Cigarette smoking and musculoskeletal disorders. *Muscle, ligament and tendon Journal,* 3(2) 63-69.

Abreu, S., Moreira-Silva, I., Mota, J., and Santos, R.2013.Article associations between Body Mass Index and Musculoskeletal Pain and Related Symptoms in Different Body Regions Among Workers. *Sage Open*, 1-6.

Aebi, M., and Boos, N.2008. Degeneration disorders of the cervical spine. Spinal disorders: fundementals of diagnosis and trearment. Philadelphia: *Springer*.

Ahlberg, G., Alfredsson, L., Fredriksson, K., Hjelm, E., Johnson, M., Kilbom, A., Vingard, E., and Wiktorin, C.2002.Original Articla Work environment and neck and shoulder pain: The influence of expeosure time. Results from a population based case-control study. Occup Environ Med,59:182-188.

Akinpelu, A., Odejide, A., and Odole, A.2009. Prevalence and pattern of Musculoskeletal Pain in a Rural Community in Southwestern Nigeria.*Journal of Epidemiology*,8.

Alcântara, M. A., Sampaio, R. F., Souza, M. A. P., Silva, F. C. M. and Kirkwood, R. N. 2013. Chronic pain profile: An interaction between biological and psychosocial factors. *Pain Studies and Treatment*, 1 (2): 9 - 16.

Allison, P.J. 2002. Alcohol consumption is associated with improved health related quality of life in head and neck cancer patients. *Oral Oncology*, 38: 81-86.

Alves, M.C., Be´rzin, F., da Graca Rodrigues Be´zin, M., and Ruivo, M.A.2015. Original Article: Prevalence of pain at the head, face and neck and its association with quality of life in the general population of Piracicaba City, Sao Paulo: an epidemiological study. 16(1)15-21.

Ammendalia, C., Cassidy, J.D., Carragee, E., Carroll, L.J., Coˆte´, P., Guzman, J., Haldeman, S., Hogg-Johnson, S., Holm, L.W., Hurwitz, E., Nordin, M., and Peloso, P. 2008. The Burden and determination of neck pain in the general population: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and its associated disorders. *Spine*, 33 (4 Suppl):539-551.

Ariens, G.A.M., Bonger, P.M., Bouter, L.M., Van der Wal, G., and van Mechelen, W.2001.Psycological Risk Factors for Neck Pain: A Systematic Review, (39)180-193. Ariens, G.A.M., Bonger, P.M., Bouter, L.M., Van der Wal, G., and Scand, J.2000. Physical risk factors for neck pain, *work environmental health*, 26(1)7-19.

Asghari, A. 2011. Psychometric Properties of a Modified version of Roland-Morris Disability Questionnaire (M-RMDQ), 14:328.

Atamaz, F., Hepguler, S., Kose, G., and Oder, G.2007.Journal: A Comparison of Four Disability Scale for Turkish Patients with Neck Pain,39:358-362.

Balderson B.H.K. and Von Korff M. 2002.The stepped care approach to chronic back pain. In: Linton SL, ed. Newwavenues for the prevention of chronic musculoskeletal pain and disability. Amsterdam: Elsevier.

Beneka. A., Godolias, G., Mallicus, P., Misailidou, V., and Karagiannidis, A.2010.Original articles: Assessment of patients with neck pain: A Review of definitions, selected criteria, and measurement tools. *Journal of Chiropractic Medicine*, 9:49-54.

Binder, A.2007. The diagnosis of nonspecific neck pain and whiplash. *Eura Medicophys*,43:79-89.

Blatter, B.M, Bongers, P.M., Ijmker, S., and van den Heuvel, S.2006. Epidemiology of work related neck and upper limb problems: Psychosocial and personal risk factors (Part I) and effective interventions from a bio behavioural perspective (Part II), 16:279–302

BMC Musculoskeletal Disorders: Psychometric characteristics of Spanish version of instruments to measure neck pain disability.2008, (9) 42.

Bramuzzo, V. 2016. A psychometric profile of patients attending the Durban University of Technology Chiropractic day clinic with non-specific low back pain. M.Tech, Durban University of Technology.

Brandon, T.H., Ditre, J.W., Meagher, M.M., and Zale, E.L.2011.NIH Public Access Pain, nicotine and smoking: Research findings and Mechanonistic Considerations. *Psychol Bull*, 137(6)1065-1093.

Brekke, M., Hjortdahl, P., and Krien, T.K.2002.Severity of Musculoskeletal Pain: relations to socioeconomic inequality. *Social Science & Medicine*, 221-228.

Bogduk, N.2003. The anatomy and pathophysiology of neck pain. WBS Physical Medicine and Rehabilitation Clinics of North America,14: 455-472.

Bope, E.T., and Douglass, A.B.2004.Evaluation and treatment of post neck pain in family practice, 17: S13-22.

Bot, S.D.M., Bouter, L.M., Dekker, J., Schelleveis, F.G., Terwee, C.B., van der Waal, J.M., and van der Windt, D.A.W.M.2005. Extended Report. Incidence and Prevalence of complaints of the neck and upper extremity in general practice, 64: 118-123.

Buchbinder, R., Dea, R., Hoy, D.G., and Protani, M.2010. The epidemiology of neck pain, (24) 783–792.

Cagnie, B., Cambier, D., Danneels, L., De Loose, V., Van Tiggelen, D.2007. Individuals and work-related risk factors for neck pain amongst office workers: a cross sectional study. *Eurospine Journal*,16: 679-686.

Cassidy, J.D., Carragee, E., Carroll, L.J., Coˆte´, P., Guzman, J., Haldeman, S., Hogg-Johnson, S., Holm, L.W., Hurwitz, E., Nordin, M., Peloso, P., and van der Velde. 2008. The Burden and determination of neck pain in workers: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and its associated disorders. *Spine*, 33 (4):560-574.

Cassidy, D., Coˆte´ DC, J., and Carroll, L.J. 2000.The Factors Associated With Neck Pain and Its Related: Disability in the Saskatchewan Population, (25)1109-1117.

Cassidy, D., Coˆte´ DC, J., and Carroll, L.J., Kristmana, V. 2004. The annual incidence and course of neck pain in the general population: a population-based cohort study, (112) 267–273.

Cassidy, J.D., Carroll, L., and Coˆte´, P. 1998. The Saskatchewan Health and Back Pain Survey. The prevalence of neck pain and related disability in Saskatchewan adults,23: 1689–1698.

Cassidy, J.D., Carroll, L., and Coˆte´, P. 2000. The Factors Associated With Neck Pain and Its Related Disability in the Saskatchewan Population, (25)1109-1117.

Cassidy, J.D., Carroll, L.J., and Coˆte´, P., and Kristmana, V.2004. The annual incidence and course of neck pain in the general population: a population-based cohort study, 267-273.

Chen, W.Q., Wang, T.W., and Yu, I.T-S.2005.Original Article Impact of occupation stress and other psychosocial factors on musculoskeletal pain among Chinese offshore oil installation workers. *Occup Environ Med*, 62:251-256.

Cristensen, K., Fredericksen, H., and Hartvigsen, J.2006. Original article: Back and Neck pain in seniors-prevalence and impact. *Eur Spine Journal*, 15:802-806.

Coggon, D., Cooper, C., Palmer, K.T., and Synddall, H. 2003. Extended Report Smoking and Musculoskeletal Disorders: findings from a British National Survey. *Ann Rheum Dis*, 62:33-36.

Cohen, S. 2015. Epidemiology, Diagnosis and Treatment of Neck Pain. *Mayo Clinic Proceedings*, 284.

Collins, R.M., Patricious, J.S., and van Reensburg, J.2011. Common work-related Musculoskeletal strains and injuries. *S Afr Fam Pract*, 53(3):240-246.

Croft, P.R., Dunn, K.M., Mallen, C.D., Peat, G., and Thomas, E.2007.Prognostic factors for musculoskeletal pain in primary care: a systemic review. *British Journa of General Practice*, 655-661.

Croft, P.R., Jayson, M.I.V., Lewis, M., Macfarlane, G.J., Papegeorgiou, A.C., Simon, A.J., and Thomas, E.2001. Risk factors for neck pain*: a longitudinal study in the general population*,317-325.

Davidson, L. 2017. Cigarette smoking and its impact on spinal fusions. Available: http://www.spineuniverse.com (Accessed 20 September 2017).

De Kroon, J.M. and Vastenholt J.M. 2003. Muscle Activation patterns in post-traumatic neck pain.

Ditre, J.W., Maisto. S.A., and Zale, E. L. 2015. Interrelations between pain and alcohol: An integrative review. *Clinical psychology review*, 37: 57-71.

Dvorak, J., Mannion, A.F., Muntener, M., and Taimela, S. 2001. Comparison of three active therapies for chronic low back pain: results of a randomized clinical trial with one-year follow-up. Rheumatology,7:772-778

Dyer, BA. 2012. An epidemiological investigation of low back pain in the white population of the greater eThekwini metropolitan area. M. Tech, Durban University of Technology.

Ferrari, R. and Russell, A.S.2003. Neck pain. Best Practice and Research. Clinical Rheumatology, 17(1): 57-70.

Ferreira, P. H., Beckenkamp, P., Maher, C. G., Hopper, J. L. and Ferreira, M. L. 2013. Nature or nurture in low back pain? Results of a systematic review of studies based on twin samples. *European Journal of Pain*, 17 (7): 957 - 971.

Fejer, R., Hartvigser, J., and Kyvik, K.O. 2006. The prevalence of neck pain in the world population: a systemic critical review of literarture, *Europe Spine Journal*,15: 834-848.

Field, J., Irgens, P., Kvammen, O.C., Lothe, L.R., and Newell, D.2013. The psychometric profile of Chiropractic patients in Norway and England: using and comparing the generic version of the STarT Back 5-item screening tool and Bournemouth Questionnaire, 21:41.

Fontes Batista, A., Lesse, I., Matos, M.A., Nunes Sa´, L., and Souza, I.2013. Workload, Neck and upper limb pain in Salvador's population. *Brazilian Journal of Medicine and Human Health Salvador*, 1(1) 3-18.

Fucks, P.N., Gatchel, R.J., Peng, Y.B., Peters, M.L., and Turk, D.C.2007.The Biopsychosocial Approach to Chronic Pain: Scientific Advances and Future Directions. *Psychosocial Bullitins*, 133(4)581-624.

Gasner, D.M., Gross, A.R., Hondros, M.A., Hoving, J.L., and Kay, T.B.2001.A critical appraisal of review articles on the effectiveness of conservative treatment for neck pain. *Spine*, 26:196-205.

Gray, H. 2013. *Gray's Anatomy*. 2013 ed. London, UK: Arcturus Publishing Ltd.

Gretz, S.S, Goolkasian, P., and Wheeler, A.H. 2008. The Neck Pain and Disability Scale: Test-retest Reliability and construct validity, 2-5.

Guez, M., Hildingsson, C., Nilsson, M., and Toolanen, G. 2002. The prevalence of neck pain: A population based study from northern Sweden. *Acta Orthop*, 73(4)455-459.

Gunasekara, F.J.2015. Alcohol-the body and health effects: A brief overview.

Ha¨kka¨nen, M., Ketola, R., Korhanen, T., Luukanen, R., Toivanen, R., and Viikari-Juntura, E.2003. Original Article: Work-related and individuals' predictors for incident neck pain among office employees working with video display unit. *Occup Environ Med*, 60: 475-482.

Hansen, G.R., and Strelzer, J. 2005. The Psychology of Pain. *Emergency Medicine clinics of North America*, 23: 339-348.

Himmel, W., Scherer, M., and Wermelling, M. 2011. GP's experiences of managing non-specific neck pain-a qualitative study. *Family Practice*, 28: 300-306.

Humpheys, B.K., Peterson, C., Wirth, B. 2016. Importance of psychological factors for the recovery from a first episode of acute non-specific neck pain-a longitudinal observation study*. Chiropractic and Manual therapy,*24:14*.*

Keller, T. and Krames, E. S. 2009. "On the Shoulders of Giants": A History of the Understandings of Pain, Leading to the Understandings of Neuromodulation. *Neuromodulation: Technology at the Neural Interface*, 12 (2): 77-84.

Kendall N.A.S, Linton S.J, Main C.J. Guide to assessing psychosocial yellow flags in acute low back pain: Risk factors for long term disability and work loss. Accident Rehabilitation and compensation Insurance Corporation of New Zealand and he National Health Committee. Wellington NZ (http://www.nhc.gov.nz)

Kim, J., Reddy, P., Shivsana, O., Sewpaul, R., and Zuma, K.2015. Prevalence of tobacco use amongst adults in South Africa: Results from the first South African National Health and Nutrition Examination Survey*. SAfr Med Journal,* 105(8) 648-655.

Kline, C.M. 2003. World Federation of Chiropractics Seventh Biennial Congress: The Cervical Spine & Sports Chiropractic, 42-46.

Lal, A. 2008. Musculoskeletal Pain and Level of Education: A cross sectional study from Ullensaker, Norway. *Master of public health MPH*, 7.

Liebenson, C. Rehabilitation of the Spine – A Practitioners Manuel.2nd Ed. *Lippincott Williams & Wilkins*, Baltimore. 1996.

Linton, S.J.2000. A Review of Psychological Risk Factors in Back and Neck, (25)1148-1156.

Lorne, M.M. 2014. Constructing and Deconstructing the Gate Theory of Pain, (2) 210-216.

Main, C.J. and Williams, C.C. 2002. Clinical Review: ABC of psychological medicine, 325.

Melzack, R. and Wall, P. D. 1967. Pain mechanisms: a new theory. *Survey of Anesthesiology*, 11 (2): 89-90.

Moayedi, M. and Davis, K. D. 2013. Theories of pain: from specificity to gate control. *Journal of neurophysiology*, 109 (1): 5-12.

Moore, K. L., Dally, A. F. and Agur, A. M. 2010. *Clinically Oriented Anatomy*. 7th ed. Philadelphia: Lippincott Williams & Wilkins.

National Council and Institute of Medicine. 2001. Musculoskeletal Disorders and the Workplace: Low Back and Upper Extremities, *National Academy Press*, Washington DC.

Pai, V.S., and Pai, V. 2016. Research article Prognostic factors for chronicity in Lumbar and Cervical Spine Conditions who are on compensation. *JSM Arthritis*, 1(2).

Pfleger, B. and Woolf, A.D.2003. Bone and Joint Decade 2000-2010: Burden of major musculoskeletal conditions, 81: 646-656.

Ratinaud, M., Chamoux, A., Glace, B. and Coudeyre, E. 2013. Job satisfaction evaluation in low back pain: A literature review and tools appraisal. *Annals of physical and rehabilitation medicine*, 56 (6): 465-481.

Rekola, K.E., Keinanen-Kiukaanniemi, S., Takala, J.1993. Use of primary health services in sparsely populated country districts by patients with musculoskeletal symptoms: consultations with a physician, 47: 153–157.

Rothfels, P., Martin, C., Noertjojo, K.2010. What's new in the literature: Nonspecific neck pain, 52:3.

Schafer, R.C., Updated 2014. Clinical Biomechanics: Musculoskeletal Actions and Reactions, 4.

Seethal, V. J. 2010. The role of psychosocial risk factors on the prevalence of low back pain amongst Grade 12 learners in public schools in the Greater Durban area. Masters Degree in Technology: Chiropractic, Durban University of Technology.

Smith, B.H., Torrance, N., and van Heck, O. 2013. Systemic Review Chronic pain epidemiology - where do lifestyle factors fit in? *British Journal of Pain*,7(4) 209-217.

Statistics South Africa. 2014. *General Household Survey*. Statistics South Africa.

Szumilas, M. 2010. Explaining odds ratios. *J Can Acad Child Adolesc Psychiatry,* 19: 227–229.

Venketsamy, Y. 2007. A retrospective cross-sectional survey of cervical cases recorded at the Durban University of Technology (D.U.T) Chiropractic Day Clinic (1995-2005). M.Tech, Durban University of Technology.

World Health Organization (WHO). 2014a. *Global status report on alcohol and health 2014*. Switzerland: WHO Press.

The World Federation of Chiropractic (online). 2003. Available: http://www.wfc.org (Accessed 20 June 2017).

World Health Organization. 2014b. *Obesity and overweight* (online). Available: http://www.who.int/mediacentre/factsheets/fs311/en/ (Accessed 14 May 2016).

Woolf, A.D. and Pfleger, B. Bone and Joint Decade 2000-2010: Burden of major musculoskeletal conditions. Bulletin of the World Health Organisation.2003:81:646-656.

Appendices

Appendix A

Permission from Ethics

Institutional Research Ethics Committee
Research and Postgraduate Support Directorate
2nd Floor, Berwyn Court
Gate 1, Steve Biko Campus
Durban University of Technology

P O Box 1334, Durban, South Africa, 4001

Tel: 031 373 2375
Email: lavishad@dut.ac.za
http://www.dut.ac.za/research/institutional_research_ethics

www.dut.ac.za

7 February 2017

IREC Reference Number: **REC 119/16**

Ms K Nana
162 Moore Road
Flat 1
Meyerton
Glenwood
Durban
4001

Dear Ms Nana

A psychosocial profile of patients presenting with non-specific neck pain to a Chiropractic Day Clinic at a University of Technology

I am pleased to inform you that Full Approval has been granted to your proposal REC 119/16.

The Proposal has been allocated the following Ethical Clearance number **IREC 006/17**. Please use this number in all communication with this office.

Approval has been granted for a period of two years, before the expiry of which you are required to apply for safety monitoring and annual recertification. Please use the Safety Monitoring and Annual Recertification Report form which can be found in the Standard Operating Procedures [SOP's] of the IREC. This form must be submitted to the IREC at least 3 months before the ethics approval for the study expires.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the IREC according to the IREC SOP's.

Please note that any deviations from the approved proposal require the approval of the IREC as outlined in the IREC SOP's.

Yours Sincerely

[redacted]
Chairperson: IREC

DUT DURBAN UNIVERSITY OF TECHNOLOGY
2017 -02- 07
INSITUTUTIONAL RESEARCH ETHICS COMMITTEE
P O BOX 1334 DURBAN 4000 SOUTH AFRICA

May 7

Appendix B

Permission from Brinique Dyer

karishma.nana@gmail.com>

to bdyer1

Hi Brinique,

My name is Karishma Nana and I'm conducting my Chiropractic research on "A psychosocial profile of patients presenting with non-specific neck pain to a Chiropractic Day Clinic at a University of Technology".

I would hereby seek your permission to use the questionnaire you formulated as a tool in my research.

If you require any further information with reference to my study, I will be willing to share my information with you.

Kind regards

Dyer, Brinique [JPPZA] <bdyer1@its.jnj.com> May 7

Hi Karishma,
I am very happy if you use my questionnaire as a guideline for your research. Good luck hope you fly through the process.
Kind regards,

Brinique

Appendix C

Permission from Dr Howard Vernon

Karishma Nana <karishma.nana@gmail.com> May 7

to hvernon

Mr H Vernon (To Whom it may concern)

My name is Karishma Nana and I am a Masters student in the process of conducting my research on "A psychosocial profile of patients presenting with non-specific neck pain to a Chiropractic Day Clinic at a University of Technology".

I hereby seek your permission to use your questionnaire "The Neck Disability Index" as a tool in my study with the appropriate referencing.

Should you agree, the knowledge of the dissertation will be acknowledge with standard reference techniques.

Kind Regards

Howard Vernon <HVernon@cmcc.ca>

Hello,

Thanks for your interest in the NDI. I am happy to provide permission for you to use it in your study.

Thanks,

Dr. Howard Vernon

From karishma.nana@gmail.com

karishma.nana <karishma.nana@gmail.com> May 8

to Howard

Dr Howard Vernon

Thank you very much for your support.

Kind regards

Karishma Nana

Appendix D

Permission from Dr Craig Liebenson

Karishma Nana <karishma.nana@gmail.com>

May 29

to craigliebenson.

Dr Craig Liebenson

My name is Karishma and a Chiropractic student in the process of completing my Masters. My study is on “A psychosocial profile of patients presenting with non-specific neck pain to a Chiropractic Day Clinic at a University of Technology”. I hereby seek permission to make use of the "Yellow Flag Form" in your book on Rehabilitation of the Spine.

Should permission be given, it will be referenced appropriately. If you require any further information on my study please feel free to ask.

Kind Regards

May 29

karishma.nana <karishma.nana@gmail.com>

to Craig

It's in Durban, South Africa.

Thank you for your kindness. I will keep you updated once I've collected all my data.

Regards

Karishma

From: Craig Liebenson <craigliebensondc@gmail.com>

To: Karishma Nana <karishma.nana@gmail.com>
Subject: Re: Research

Hi Karishma

Where is the Durban University?

Yes, you have my permission.

It is in use in Denmark also.

Please keep in the loop re: your data collection

Thanks

Craig

Appendix E

Permission for use of the Chiropractic Day Clinic

MEMORANDUM

To : Prof Puckree
Chair : RHDC

Prof Adam
Chair : IREC

From : Dr Charmaine Korporaal
Clinic Director : FoHS Clinic

Date : 17.03.2017

Re : Request for permission to use the Chiropractic Day Clinic for research purposes

---

Permission is hereby granted to :

Ms Karishma Nana (Student Number: 21001019)

Research title : "A psychosocial profile of patients presenting with non-specific neck pain to a Chiropractic Day Clinic at a University of Technology."

It is requested that Ms Nana submit a copy of her RHDC / IREC approved proposal to the Clinic Administrators before she starts with her research in order that any special procedures with regards to her research can be implemented prior to the commencement of her seeing patients.

Thank you for your time.

Kind regards

[redacted]

Dr Charmaine Korporaal

Clinic Director : FoHS Clinic

Cc: Mrs Linda Twiggs : Chiropractic Day Clinic
Dr L O'Connor : Research co-ordinator
Dr Ndlovu / Mrs Young : Research supervisors

Appendix F

Permission to Conduct Research at DUT

Directorate for Research and Postgraduate Support
Durban University of Technology
Tromso Annexe, Steve Biko Campus
P.O. Box 1334, Durban 4000
Tel.: 031-3732576/7
Fax: 031-3732946
E-mail: moyos@dut.ac.za

2 June 2017

Ms Karishma Nana
c/o Faculty of Health Sciences
Durban University of Technology

Dear Ms Nana

PERMISSION TO CONDUCT RESEARCH AT THE DUT

Your email correspondence in respect of the above refers. I am pleased to inform you that the Institutional Research Committee (IRC) has granted permission for you to conduct your research "A psychosocial profile of patients presenting with non-specific neck pain to a Chiropractic Day Clinic at a University of Technology" at the Durban University of Technology.

The DUT may impose any other condition it deems appropriate in the circumstances having regard to nature and extent of access to and use of information requested.

We would be grateful if a summary of your key research findings can be submitted to the IRC on completion of your studies.

Kindest regards.
Yours sincerely

[redacted]

PROF SIBUSISO MOYO
DVC (ACTING): RESEARCH, INNOVATION AND ENGAGEMENT
DIRECTOR: RESEARCH AND POSTGRADUATE SUPPORT

Appendix G

Permission from the Reception staff

Dear Mrs P. van den Berg, Ms G. Mkhwanazi, Ms J. Basdev and Ms S. Brecher

RE: A request for assistance with administration of the research project titled "A psychosocial profile of patients presenting with non-specific neck pain to a Chiropractic Day Clinic at a University of Technology".

The aim of the study is to identify psychometric factors of patients attending the Durban University of Technology (DUT) Chiropractic Day Clinic (CDC) with non-specific neck pain. For this to be achieved each new patient attending to the clinic over the three months of data collection will be invited to participate. The researcher will provide the necessary paperwork (research folders) in a box.

The role of:

Ms G. Mkhwanazi, Ms T. Basdev and Ms S. Brecher

When a new patient presents to the clinic with a spinal complaint or neck pain please can you give them one of my research folders. The Masters study will then gain consent from the patient and if the patient is willing to participate they will be required to complete the necessary paperwork within the research folder. This folder will be put back into the patients file and returned to the clinic.

Ms Van Den Berg

When the patients file is ready for capturing, if you could please remove the research folder and place in to the research box provided. If the patient chose not to participate in the study or if it was not a neck pain patient could you please place the unused research folders into a different box that will be provided.

The researcher will come collect the boxes daily from the reception and removed the completed research files. A minimum of 109 participants are required for the validity of this study.

Your assistance will be greatly appreciated.

Please tick appropriately:

I am willing to be of assistance in this study …….

I do not wish to assist in this study ……

Name:……
Signature:……

Yours sincerely,

Karishma Nana

B. Tech Chiropractic

Dr P.Z Twala (Supervisor) Mrs K. Young (Co-supervisor)

M. Tech Chiropractic M Ed (Psych)

Note: The original signed documentation is in the possession of the researcher whereby the clinic staff has given consent to assist in the research process

Appendix H

LETTER OF INFORMATION AND INFORMED CONSENT

Dear Participant

I would like to welcome you and thank you for participating in my research study.

Title of the Research Study: "A psychosocial profile of patients presenting with non-specific neck pain to a Chiropractic Day Clinic at a University of Technology".

Principal Investigator/s/researcher: Karishma Nana (B. Tech: Chiropractic)

Co-Investigator/s/supervisor/s: Dr. P.Z.Twala (M. Tech: Chiropractic)

Mrs K.Young

Brief Introduction and Purpose of the Study:

Non-specific neck pain is a major health problem which is a leading cause of disability worldwide, and accounts for numerous medical consultations. The risk factors and perpetuating factors of developing non-specific neck pain is important and therefore needs to be recognised. The aim of the study is to determine a profile of patients

presenting to the Durban University of Technology Chiropractic Day Clinic with non-specific neck pain using the Neck Disability Index (NDI) and Yellow Flags Form.

Outline of Procedures: If you are willing to participate in the research and have signed the letter of informed consent (below), you are encouraged to complete the questionnaire which will be handed out to you at the Durban University of Technology Chiropractic Day Clinic. Participation in the study will not interrupt your treatment and will require a short amount of time to complete and handed in.

Risks or Discomforts to the Participant: There are no risks or discomforts pertaining to this study if you choose to partake in completing the questionnaire.

Benefits: The study will indirectly benefit the participants because the study will fill in the paucity in the literature pertaining to the chiropractic care of non-specific neck pain, and especially those patients transitioning from acute to chronic pain in the Ethekweni Municipality. This will assist both the patients and health care professionals in aid to develop a more appropriate treatment.

Reason/s why the Participant May Be Withdrawn from the Study: There will be no adverse consequences should you choose to withdraw from the study. However, please note that once the questionnaire has been completed and handed in, it may not be tampered with as this will infringe on the confidentiality of the study.

Remuneration: Participation in the research study is voluntary and no remuneration will be awarded.

Costs of the Study: There are no additional costs associated with the patients participating in this study.

Confidentiality: Answers to the questionnaire are confidential and will not be linked to you. The letter of informed consent and confidentiality as well as the questionnaire will be stored in separate boxes as to maintain confidentiality. The questionnaire will be analyzed by means of a statistician and the information will only be utilized for purposes of this research. Once the study is completed the research data will be kept securely on the Department of Chiropractic for five years.

Research-related Injury: There is no risk of any injuries as you are only required to complete a questionnaire.

Your participation in my study will be much appreciated.

Please complete the consent form below should you wish to participate in the study.

Persons to Contact in the Event of Any Problems or Queries:

Principle Researcher: Karishma Nana 031 373 2205

Supervisor: Dr. T.Z Twala 031 373 6321

Co-supervisor: Ms K.Young

Insitutional Research Ethics administrator 031 373 2900

Complaints can be reported to the DVC: TIP, Prof F. Otieno on 031 373 2382 or dvctip@dut.ac.za

Incwadi Yolwazi (A letter of information)

Mbambiqhaza othandekayo

Ngiyakwamukela, ngiphinde ngibonge ngokubamba kwakho iqhaza kulolu cwaningo.

Isihloko socwaningo/sophenyo: Iphrofayeli yeziguli ezivakashela umtholampilo weKhayirophrakthikhi eNyuvesi yobuchwepheshe yaseThekwini zikhala ngobuhlungu bentamo ekubeni umsuka ungaqondakali.

Umphenyi: Karishma Nana (B. Thekhi: Khayirophrakthiki)

Abaphathi: Dr. P.Z.Twala (M. Thekhi: Khayirophrakthiki)

Mrs K.Young

Isingeniso socwaningo kafushane kanye nenhloso yocwaningo:

Ubuhlungu bentamo obungaqondakali buyinkinga enkulu kwezempilo futhi buyimbangela ehamba phambili yokukhubazeka emhlabeni jikelele, kanti futhi buyabandakanyeka ekusetshenzisweni komnyango wezempilo/ wezokulapha kaningana. Izici ezikubeka engcupheni neziqhubekisela phambili ukuthi uphathwe intamo engaqondakali zibalulekile futhi kumele ziqashelwe. Inhloso yalolu phenyo ukuhlaziya/ukunquma iphrofayeli yeziguli ezivakashela umtholampilo weKhayirophrakthikhi eNyuvesi yobuchwepheshe yaseThekwini zikhala ngobuhlungu bentamo ekubeni umsuka ungaqondakali, ngokusebenzisa uhla lwezinkomba

zokukhubazeka kwentamo nefomu lezinkomba ezengeza amathuba okukhubazeka kwentamo isikhathi eside.

Uhlaka lwenqubo yocwaningo: Uma uzimisele ukubamba iqhaza kulolu cwaningo futhi usuyisayinile incwadi yesivumelwano esicatshangisisiwe (engezansi), uyakhuthazwa ukuthi uphendule inhlolomibuzo ozonikezwa yona emtholampilo weKhayirophrakthikhi eNyuvesi yobuchwepheshe yaseThekwini. Ukubamba kwakho iqhaza kulolu cwaningo ngeke kuphazimise ukwelashwa kwakho, kanti futhi kuzothatha isikhashana esincane ukuphendula inhlolomibuzo ubese uyayibuyisela.

Izingozi noma ukungaphatheki kahle komhlanganyeli/kombambiqhaza: Azikho izingozi noma ukungaphatheki kahle okubangelwa ukubamba kwakho iqhaza kulolu phenyo, uma ukhetha ukubamba iqhaza ngokuphendula inhlolomibuzo.

Izinzuzo: Ucwaningo luzosiza umbambiqhaza ngokuthi lwandise ulwazi oluphathelene nekhayirophrakthikhi ekulashweni kobuhlungu bentamo obungaqondakali umsuka wakho, ikhakhulukazi lezo ziguli eseziqala ukusuka esigabeni esifushane zingenela esigabeni eside/esigxilile sobuhlungu bentamo kuMasipala weTheku. Lokhu kuzosiza iziguli kanye nabezempilo ukuqhamuka nohlobo olufanele lokwelapha ubuhlungu bentamo.

Izizathu ezingenza umbambiqhaza ahoxiswe kulolu phenyo: Angeke kubekhona izinkinga uma ukhetha ukuhoxa ekubambeni iqhaza kulolu phenyo. Kepha, Uyacelwa ukuba wazi ukuthi uma inhlolomibuzo isiphothuliwe yabekwa/yagcinwa, angeke isasuswa ngoba lokhu kungakhinyabeza ubumfihlo bophenyo.

Umkomelol/umholo: Ukuhlanganyela kulolu phenyo kuwukuzithandela, kanti futhi alikho iholo/umkomelo ozowuthola ngokuzibandakanya kulolu phenyo.

Izindleko/izimali ezikhokwayo zocwaningo: Azikho izimali ezengeziwe ezikhokhwa iziguli ezihlobene nokubamba iqhaza kulolu cwaningo.

Ubumfihlo: Izimpendulo zakho zenhlolomibizo angeke zixhunyaniswe nawe. Kanti futhi Incwadi yesivumelwano esicatshangisisiwe nobumfihlo kanye nenhlolomibuzo kuzogcinwa emabhokisini ahlukene ukuze kuqinisikesiswe ubumfihlo. Inhlolomibuzo izohlaziywa ngusozibalo kanti futhi imininingwane izosetshenziswa kuphela kulolu cwaningo. Uma ngabe ucwaningo seluphothuliwe, ulwazi luzogcinwa ngokuphephile emnyangweni weKhayirophrakthiki iminyaka eyisihlanu.

Ukulimala okuphathelene nocwaningo: Njengoba uzophendula inhlolomibuzo kuphela, akukho ingcuphe yengozi noma ukulimala okungakukwehlela.

Ukubamba kwakho iqhaza kulolu cwaningo kuyancomeka kakhulu.

Sicela ugcwalise ifomu lesivumelwano esicatshangisisiwe ngezansi uma ufisa ukubamba iqhaza ocwaningweni.

Abantu ongaxhumana nabo uma unenkinga noma imibuzo:

Umphenyi: Karishma Nana 031 373 2205

Umphathi: Dr. T.Z Twala 031 373 6321

Ms K.Young

Umlawuli wezimiso zokuhle kuCwaningo weSikhungo 031 373 2900

Izinkonondo zingadluliselwa futhi kumphathi/umqondisi wezoCwaningo nesisekelo semfundo ephakeme DVC: TIP, Solwazi F. Otieno 031 373 2382 / dvctip@dut.ac.za

Appendix I

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, _____ (name of researcher), about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: _____,
- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

_____ _____ _____ _____

Full Name of Participant **Date** **Time** **Signature**

I, Karishma Nana, herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

_____ _____ _____

Full Name of Researcher **Date** **Signature**

_____	_____	_____
Full Name of Witness (If applicable)	**Date**	**Signature**

Thank you for participating in my study.

Sincerely,

Karishma Nana.

Ifomu lesivumelwano esicatshangisisiwe (Consent form)

Isitatimende semvumelwano yokuba umbambiqhaza kulolu cwaningo:

- Mina ngiyaqinisekisa ukuthi umphenyi _____ (Igama lo mphenyi) ungazisile ngenkambo, uhlobo, izinzuzo kanye nobungozi balolu cwaningo- Inombolo yophenyo: _____

- Incwadi yolwazi olumayelana no cwaningo engenhla ngiyitholile, ngayifunda futhi ngayiqondisisa.

- Ngiyaqonda ukuthi imiphumela yocwaningo, okubalwa kuyo imininingwane yami yobulili, iminyaka, usuku lokuzalwa, ama-inishiyali nokuthi ngiphethwe yini kuzosetshenzwa ngokuyimfihlo ukuze kwenziwe umbiko wocwaningo.

- Ngokubona izidingo zocwaningo, mina ngiyavuma ukuthi imininingwane yalolu cwaningo isetshenzwe ohlelweni lwekhompiyutha.

- Ngingakwazi, kunoma yisiphi isigaba ukuthi ngihoxise imvume nokubamba kwami iqhaza kulolu cwaningo ngale kwengcindezi.

- Ngibe nethuba elanele lokubuza imibuzo futhi ngiyafunga ukuthi ngikulungele ukubamba iqhaza kulolu cwaningo.

- Ngiyaqonda ukuthi lokho okusha, okubalulekile futhi okuthintana nokubamba kwami iqhaza ngenkathi kwenziwa lolu cwaningo ngizovumeleka ukukwazi.

Mina, Karishma Nana, ngiyaqinisekisa ukuthi lo mbambiqhaza ongenhla uchazeliwe ngohlobo, inkambo nobungozi balolu cwaningo.

_____ _____ _____

Igama (Eliphelele) lomphenyi Usuku Isiginisha

_____ _____ _____

Igama (eliphelele) likafakazi Usuku Isiginisha

Ngiyabonga ngokubamba kwakho iqhaza kulolu cwaningo.

Ozithobayo,

Karishma Nana.

Appendix J

Demographics Questionnaire

DEMOGRAPHIC AND SOCIAL HISTORY QUESTIONNAIRE					
Instructions: Please put an 'X' in the applicable box.					
PART A: DEMOGRAPHICS					
1	How old are you?	_____ years			
2	Gender	Female	Male		
3	Height (cm)	_____ (*to be filled in by the Masters student*)			
4	Weight (kg)	_____ (*to be filled in by the Masters student*)			
5	BMI	_____ (*to be filled in by the Masters student*)			
6	Where do you live?	Central Business District	Residential area	Rural area	Other (specify) _____

7	What is the highest level of education you have obtained?	No formal education	Primary school	High school	Matriculated	Tertiary	Other (specify)
8	What is your current smoking status?	Current smoker		Ex-smoker		Non smoker	
9	Current smokers only	On average, how many cigarettes do you smoke per day?					
		Duration of smoking? (how many years)					
10	Ex-smokers only	How long ago did you quit smoking? (how many years)					
		For how long did you smoke before you quit? (how many years)					
11	Do you drink alcohol?	Yes			No		
12	If YES, how many alcoholic drinks do you consume per week?	1-3		4-6		More than 6	
13	Do you do any exercise?	Yes			No		
14	What type of exercise do you do most of the time?	Aerobics	Badminton	Boxing	Cardio (Gym)	Cricket	Cycling

		Fishing	Golf	Martial Arts	Road Running	Rugby	Squash
		Soccer	Surfing	Swimming	Tennis	Walking	Weight Training
		Yoga / Pilates	Other (specify) _____				
15	On average, what amount of time is spent exercising per week?	_____ hours					
16	What is your current work status?	Employed full time	Employed part time	Housewife	Retired	Self Employed	Student
		Unemployed	Other (specify) _____				
17	If employed, what is your occupation?	Artisan/ Tradesman	Business person	Clerical	Farmer	House Executive	Managerial

		Sales Person	Student	Other (specify) _____			
18	How long have you been in this occupation?	_____ years					
19	If retired/ unemployed, what was your previous occupation?	Artisan/ Tradesman	Business person	Clerical	Farmer	House Executive	Managerial
		Sales Person	Student	Other (specify) _____			
20	For how long were you in this occupation?	_____ years					
21	Which best describes your physical activity at work in the last year?	Sitting work	Light physical work	Moderate heavy work	Heavy work	Driving for long hours	Other (specify) _____

PART B: WORK SATISFACTION

Job In General

1	Think of your job in general. All in all, what is it like most of the time?	Pleasant	Bad	Great
		Waste of time	Good	Undesirable

	In the blocks alongside, beside each word or phrase, write: Y for "Yes" if it describes your job N for "No" if it does not describe your job ? if you cannot decide			
		Worthwhile	Worse than most	Acceptable
		Superior	Better than most	Disagreeable
		Makes me content	Inadequate	Excellent
		Rotten	Enjoyable	Poor

Inhlolomibuzo yedemografikisi

INHLOLOMIBUZO YEDEMOGRAFIKISI NOMLANDO WENHLALAKAHLE					
Imiyalelo: Sicela ubeke uphawu u 'X' ebhokisini elifanele.					
INGXENYE A: DEMOGRAFIKISI					
1	Uneminyaka emingaki?	_____ (iminyaka)			
2	Ubulili	Owesifazane	Owesilisa		
3	Ubude bakho (amasentimitha)	_____ (*Kugcwaliswa umfundi owenza iMastazi*)			
4	Isisindo sakho (amakhilogramu)	_____ (*Kugcwaliswa umfundi owenza iMastazi*)			
5	Isisindo esihlanganiswe nobude	_____ (*Kugcwaliswa umfundi owenza iMastazi*)			
6	Uhlala kuphi?	Phakathi edolobhen	Endaweni yokuhlala (Elokishini	Emakhaya	Okunye (cacisa) _____

		i (eflethini, njalonjalo)	/Esilungwini)				
7	Ingabe iliphi izinga eliphakeme le mfundo osulitholile?	Akukho imfundo yasesikoleni	Isikole sebanga eliphansi	Isikole sebanga eliphezulu	Umatikuletsheni	Imfundo ephakeme	Okunye (cacisa)
8	Ingabe uyabhema njengamanje?	Ngiyabhema		Ngangibhema		Angibhemi	
9	Lapha kuphendula kuphela ababhemayo njengamanje	Ngokwesilinganiso, bangaki osikilidi/ogwayi obabhemayo ngosuku?					
		Mingaki iminyaka ubhema?					
10	Lapha kuphendula ababebhema phambilini kuphela	Sekuyiminyaka emingaki wayeka ukubhema?					
		Wabhema iminyaka emingaki, ngaphambi kokuba uyeke?					
11	Uyabuphuza utshwala?	Yebo			Cha		
12	Uma uphendule yebo, ingabe uphuza utshwala obungakanani ngesonto?	1-3		4-6		Ngaphezu kwesithupha	
13	Ingabe uyazivocavoca?	Yebo			Cha		

14	Hlobo luni lokuzivocavoca ojwayele ukulenza?	Ukuviviny a umzimba ngendlela	Badmint on	Isibhakela	Ukujimisa inhliziyo (njengokub hukuda)	Ikhilikithi	Ukushova ibhayisikili
		Ukudoba	Igalofu	Ezokulwa	Ukugijima	Ibhola lombhoxo	Ugalonci
		Ibhola likanobhu tshuzway o	Ukusefa emagag asini	Ukubhuku da	Ithenisi	Ukuhamb a	Ukuqukula izinsimbi
		Yoga / Pilates	Okunye (cacisa) _____				
15	Ngokwesilinganiso, singakanani isikhathi osichithayo uma uzivocavoca?	_____ amahora					
16	Sithini isimo sakho ngokomsebenzi njengamanje?	Uqashwe ngokugcw ele	Uqashw e okwesik hashan a	Ungum ma onakekel a ikhaya	Sowathath a umhlalaph ansi	Uyaziseb enza	Ungumfund i

		Awusebenzi	Okunye (cacisa) _____				
17	Uma usebenza njengamanje, hlobo luni lomsebenzi owenzayo?	Ingcweti	Usoma bhizinisi	Umabhalane	Umlimi	Umama onakekela ikhaya	Umphathi
		Umdayisi	Umfundi	Okunye (cacisa) _____			
18	Sekuyisikhathi esingakanani wenza lolu hlobo lomsebenzi?	_____ (iminyaka)					
19	Uma kuwukuthi awusebenzi noma sowathatha umhlalaphansi, hlobo luni lo msebenzi owalenza isikhathi eside phambilini?	Ingcweti	Usoma bhizinisi	Umabhalane	Umlimi	Umama onakekela ikhaya	Umphathi
		Umdayisi	Umfundi	Okunye (cacisa) _____			
20	Uwusebenze isikhathi esingakanani lo msebenzi ongenhla?	_____ (iminyaka)					
21	Yikuphi okuchaza kangcono umsebenzi wamandla ophathelene	Umsebenzi wokuhlala	Umsebenzi wamandla	Umsebenzi wamandla osinda	Umsebenzi wamandla osinda kakhulu	Ukushayela amahora amade	Okunye (cacisa)

	nomsebenzi wakho kulo nyaka odlule?		othambile	ngokulingene			_____

INGXENYE B: Isiteshi somsebenzi				
Umsebenzi jikelele				
1	Cabanga umsebenzi wakho jikelele. Empeleni, ezikhathini eziningi uzizwa kanjani ngomsebenzi wakho? Emabhokisini, eceleni kwegama noma isisho bhala: Y omele u “Yebo” uma kuchaza umsebenzi wakho C omele u “Cha” uma kungachazi umsebenzi wakho ? uma uhluleka ukukhetha	Umnandi	Awukulungile	Umnandi kakhulu
		Ungichithela isikhathi	Uyancomeka	Awuthandeki
		Uyazuzisa	Mubi kuneminye eminingi imisebenzi	Uyamukeleka
		Uphakeme	Ungcono kuneminye eminingi imisebenzi	Awumnandi
		Ungenza ngihleleke	Awenele	Muhle kakhulu
		Ubolile	Uyajabulisa	Uyantula

Appendix K

Neck Disability Index

Neck Disability Index

This questionnaire has been designed to give us information as to how your neck pain has affected your ability to manage in everyday life. Please answer every section and **mark in each section only the one box that applies to you**. We realise you may consider that two or more statements in any one section relate to you, but please just mark the box that most closely describes your problem.

Office Use Only

Name _____

Date _____

Section 1: Pain Intensity

- ☐ I have no pain at the moment
- ☐ The pain is very mild at the moment
- ☐ The pain is moderate at the moment
- ☐ The pain is fairly severe at the moment
- ☐ The pain is very severe at the moment
- ☐ The pain is the worst imaginable at the moment

Section 2: Personal Care (Washing, Dressing, etc.)

- ☐ I can look after myself normally without causing extra pain
- ☐ I can look after myself normally but it causes extra pain
- ☐ It is painful to look after myself and I am slow and careful
- ☐ I need some help but can manage most of my personal care
- ☐ I need help every day in most aspects of self care
- ☐ I do not get dressed, I wash with difficulty and stay in bed

Section 3: Lifting

- ☐ I can lift heavy weights without extra pain
- ☐ I can lift heavy weights but it gives extra pain
- ☐ Pain prevents me lifting heavy weights off the floor, but I can manage if they are conveniently placed, for example on a table
- ☐ Pain prevents me from lifting heavy weights but I can manage light to medium weights if they are conveniently positioned
- ☐ I can only lift very light weights
- ☐ I cannot lift or carry anything

Section 4: Reading

- ☐ I can read as much as I want to with no pain in my neck
- ☐ I can read as much as I want to with slight pain in my neck
- ☐ I can read as much as I want with moderate pain in my neck
- ☐ I can't read as much as I want because of moderate pain in my neck
- ☐ I can hardly read at all because of severe pain in my neck
- ☐ I cannot read at all

Section 5: Headaches

- ☐ I have no headaches at all
- ☐ I have slight headaches, which come infrequently
- ☐ I have moderate headaches, which come infrequently
- ☐ I have moderate headaches, which come frequently
- ☐ I have severe headaches, which come frequently
- ☐ I have headaches almost all the time

Section 6: Concentration

- ☐ I can concentrate fully when I want to with no difficulty
- ☐ I can concentrate fully when I want to with slight difficulty
- ☐ I have a fair degree of difficulty in concentrating when I want to
- ☐ I have a lot of difficulty in concentrating when I want to
- ☐ I have a great deal of difficulty in concentrating when I want to
- ☐ I cannot concentrate at all

Section 7: Work

- ☐ I can do as much work as I want to
- ☐ I can only do my usual work, but no more
- ☐ I can do most of my usual work, but no more
- ☐ I cannot do my usual work
- ☐ I can hardly do any work at all
- ☐ I can't do any work at all

Section 8: Driving

- ☐ I can drive my car without any neck pain
- ☐ I can drive my car as long as I want with slight pain in my neck
- ☐ I can drive my car as long as I want with moderate pain in my neck
- ☐ I can't drive my car as long as I want because of moderate pain in my neck
- ☐ I can hardly drive at all because of severe pain in my neck
- ☐ I can't drive my car at all

- ☐ I have no trouble sleeping
- ☐ My sleep is slightly disturbed (less than 1 hr sleepless)
- ☐ My sleep is mildly disturbed (1-2 hrs sleepless)
- ☐ My sleep is moderately disturbed (2-3 hrs sleepless)
- ☐ My sleep is greatly disturbed (3-5 hrs sleepless)
- ☐ My sleep is completely disturbed (5-7 hrs sleepless)

Section 10: Recreation

- ☐ I am able to engage in all my recreation activities with no neck pain at all
- ☐ I am able to engage in all my recreation activities, with some pain in my neck
- ☐ I am able to engage in most, but not all of my usual recreation activities because of pain in my neck
- ☐ I am able to engage in a few of my usual recreation activities because of pain in my neck
- ☐ I can hardly do any recreation activities because of pain in my neck
- ☐ I can't do any recreation activities at all

Score: ___/50 **Transform to percentage score x 100 = %points**

Scoring: For each section the total possible score is 5: if the first statement is marked the section score = 0, if the last statement is marked it = 5. If all ten sections are completed the score is calculated as follows:

Example: 16 (total scored)
50 (total possible score) x 100 = 32%

If one section is missed or not applicable the score is calculated:

16 (total scored)
45 (total possible score) x 100 = 35.5%

Minimum Detectable Change (90% confidence): 5 points or 10 %points

---

NDI developed by: Vernon, H. & Mior, S. (1991). The Neck Disability Index: A study of reliability and validity. Journal of Manipulative and Physiological Therapeutics. 14, 409-415

Okokusetshenziswa ehhovisi kuphela (Neck Disability Index)

Igama _____

Usuku _____

Uhla lwezinkomba zokukhubazeka kwentamo

Le nhlolomibuzo isungelelwe ukuthola ulwazi lokuthi ubuhlungu bentamo yakho bukukhinyabeze kangakanani ekuqhubekeni nempilo yakho yemihla ngemihla. Uyacelwa ukuthi uphendule zonke izingxenye ngokubeka uphawu eduze kwebhokisi elilodwa elihambelana nawe engxenyeni ngayinye. Siyazi ukuthi kungenzeka ubone sengathi izimpendulo ezimbili noma ngaphezulu zivumelana nawe kunoma iyiphi ingxenye, kodwa uyacelwa ukuthi ukhethe leyo mpendulo echaza inking yakho kakhulu okwangempela kunezinye.

Isigaba sokuqala: Igalelo lobuhlungu

□ Anginabo ubuhlungu okwamanje

□ Ubuhlungu bukhona into engatheni okwamanje

□ Ubuhlungu bukhonyana okwamanje

□ Ubuhlungu bunzima kancane okwamanje

□ Ubuhlungu bunzima kakhulu okwamanje

□ Ubuhlungu budlulele ngendlela ongeke wayicabanga njengamanje.

Isigaba sesibili: Ukunakekelwa kwesiqu somuntu (ukuwasha, ukugqoka, njalonjalo)

□ Ngiyakwazi ukuzinakekela ngokwenjwayelo ngaphandle kokuzizwisa ubuhlungu obengeziwe

□ Ngiyakwazi ukuzinakekela ngokwenjwayela kodwa lokho kwengeza izinhlungu.

□ Ukuzinakekela kudala izinhlungu kanti ngenza kancane kwengikwenzayo futhi ngiyaqaphela.

□ Angigqoki, ngiwasha kanzima futhi ngihlezi ngilele embhedeni.

Isigaba sesithathu: Ukukhweza/ukuqukula

□ Ngiyakwazi ukuqukula izinto ezisindayo ngaphandle kokwengeza izinhlungu.

□ Ngiyakwazi ukuqukula izinto ezisindayo kodwa lokho kwengeza/kunyusela izinhlungu.

□ Ubuhlungu buyangivimba ukuqukula izinto ezisindayo phansi, kepha ngiyakwazi ukuziqukula uma zibekwe ngendlela elula, isibonelo uma zibekwe etafuleni.

□ Ubuhlungu buyangivimbela ukuqukula izinto ezisindayo kodwa ngiyakwazi ukuqukula izinto ezisinda kancane uma zibekwe ngendlela elula.

□ Ngikwazi ukuqukula izinto ezinesisindo esincane kuphela.

□ Angikwazi ukuqukula noma ukuphatha lutho.

Isigaba sesine: Ukufunda

□ Ngiyakwazi ukufunda ngendlela engithanda ngayo ngaphandle kokuba nobuhlungu entanyweni yami.

□ Ngiyakwazi ukufunda ngendlela engithanda ngayo kepha ngiyabuzwa ubuhlungwana entanyweni yami.

□ Ngiyakwazi ukufunda ngendlela engithanda ngayo kepha ngiyabuzwa ubuhlungu obukhudlwana entanyweni yami

□ Angikwazi ukufunda ngendlela engithanda ngayo ngoba kunobuhlungu obukhudlwana entanyweni yami

□ Angikwazi nje ukufunda kwakona ngenxa yobuhlungu obukhulu kakhulu entanyweni yami

□ Angikwazi kwakona ukufunda

Isigaba sesihlanu: Ukuphathwa yikhanda

□ Angiphathwa yikhanda kwakona

□ Ngiphathwa yikhanda, elijwayele ukufika ngezikhathi ezingafani

□ Ngiphathwa yikhanda elijwayele ukufika ngesikhathi esifanayo

□ Ngiphathwa yikhanda elibuhlungwana, elijwayele ukufika ngesikhathi esifanayo

□ Ngiphathwa yikhanda elibuhlungu kakhulu, elijwayele ukufika ngesikhathi esifanayo

□ Ngiphathwa yikhanda cishe ngaso sonke isikhathi

Isigaba sesithupha: Ukucabangisisa

□ Ngiyakwazi ukucabangasisa kahle uma ngifisa ngaphandle kobunzima.

□ Ngiyakwazi ukucabangisisa kahle uma ngifisa kepha buyaba khona ubuhlungu obuncane entanyweni yami

□ Nginenkinga kancane ekucabangisiseni lapho ngifuna khona ngempela

□ Nginenkinga enkudlwana ukucabangisisa lapho ngifuna khona ngempela.

□ Nginenkinga enkulu kakhulu ukucabangisisa lapho ngifuna khona.

□ Angikwazi kwakona ukucabangasisa.

Isigaba sesikhombisa: Umsebenzi

□ Ngiyakwazi ukwenza wonke umsebenzi engifuna ukuwenza

□ Ngikwazi ukwenza wonke umsebenzi wami wenjwayelo kuphela kodwa lutho ngaphezu kwalokho

□ Ngiyakwazi ukwenza iningi lomsebenzi wami wenjwayelo, kodwa hhayi ngaphezu kwalokho

□ Angikwazi ukwenza umsebenzi wami wenjwayelo

□ Noma yimuphi umsebenzi ngiwenza kanzima

□ Angikwazi ukwenza lutho oluwumsebenzi

Isigaba sesishiyagalombili: Ukushayela

□ Ngiyakwazi ukushayela imoto yami ngale kokuzwa ubuhlungu bentamo

□ Ngiyakwazi Ukushayela Imoto yami ngendlela engithanda ngayo kepha ngiyaye ngizwe ubuhlungu obuncanyana entanyweni

□ Ngiyakwazi ukushayela imoto yami ngendlela engithanda ngayo kepha ngiba nobuhlungu obukhudlwana entanyweni

□ Angikwazi ukushayela imoto yami ngendlela engithanda ngayo ngenxa yobhuhlungu obukhudlwana engibuzwayo entanyweni

□ Kunzima ukushayela ngenxa yobuhlungu obukhulu engibuzwayo entanyweni

□ Angikwazi kwakona ukushayela imoto yami

Isigaba sesishiyagalolunye: Ukulala

□ Anginankinga yokulala

□ Ubuthongo bami buyaphazamiseka kancanyane (ngaphansi kwehora lokungalali)

□ Ubuthongo bami buyaphazamiseka kancane (ihora elilodwa kuya kwamabili okungalali)

□ Ubuthongo bami buyaphazamiseka kakhulu (amahora amabili kuya kwamathathu)

□ Ubuthongo bami buyaphazamiseka kakhudlwana (amahora amathathu kuya kwayisihlanu okungalali)

□ Ubuthongo bami buphazamiseka ngendlela edlulile (amahora ayisihlanu kuya kwayisikhombisa okungalali)

Isigaba seshumi: Ukuzithokozisa

□ Ngiyakwazi ukuzibandakanya ekuzithokoziseni kwami ngaphandle kokuthi ngizwe ubuhlungu bentamo.

□ Ngiyakwazi ukuzibandakanya ekuzithokoziseni kwami, kepha buba khona ubuhlungu entanyweni

□ Ngiyakwazi ukuzibandakanya ekuzithokoziseni okuningi, kodwa hhayi yonke indlela engijwayele ukuzithokozisa ngayo ngenxa yobuhlungu engiba nabo entanyweni yami

□ Ngikwazi ukuzibandakanya ekuzithokoziseni kwami kwenjwayelo okukhethekileyo ngenxa yobuhlungu bami bentamo

□ Kunzima ukuzithokozisa ngenxa yobuhlungu engibuzwayo entanyweni yami

□ Angikwazi kwakona ukuzibandakanya ekuzithokoziseni

Umphumela: /50 ukushintsha kuya kumaphuzu ephesenti x 100 = % amaphuzu

Imiphumela: Ingxenye ngayinye inani elifanele lamaphuzu ayisihlanu: uma isitatimende sokuqala simakiwe amaphuzu engxenye alingana no=0, umaisitatimende sokugcina simakiwe amaphuzu=5. Uma zonke izingxenye eziyishumi zigcwalisiwe amaphuzu abalwa ngalendlela elandelayo: Isibonelo: 16 (inani lemiphumela) uliphindaphinde ngama-100 =32%

Uma ingxenye eyodwaishiyiwe yangaphendulwa/yangamakwa noma ingafaneleki, Umphumela/amaphuzu abalwa: 16 (inani lamaphuzu)

45 (inani lamaphuzu anokwenzeka) x 100 = 35.5%

Amaphuzu amancane atholakele (90% iqholo): amaphoyinti ayi-5 noma amaphuzu ay-10 %

Uhla lwezinkomba zokukhubazeka kwentamo lwasungulwa: Vernon, H. & Mior, S. (1991). Uhla lwezinkomba zokukhubazeka kwentamo. Ucwaningo lokuthembeka nobuqiniso. IJenali yokuManiphuletha neFisiyolojikhali Teraphiyuthikisi. 14, 409-415

Appendix L

Yellow Flags Form

Name: Primary complaint:

1. Please indicate your usual level of pain during the past week

No pain									**Worse pain possible**	
0	1	2	3	4	5	6	7	8	9	10

2. Does pain, numbness, tingling or weakness extend into your arm (from the neck)?

None of the time									**All of the time**	
0	1	2	3	4	5	6	7	8	9	10

3. How would you rate your general health? (10x)

Poor										**Excellent**
0	1	2	3	4	5	6	7	8	9	10

4. If you had to spend the rest of your life with your condition a it is right now. How would you feel about it?

Delighted										**Terrible**
0	1	2	3	4	5	6	7	8	9	10

5. How anxious (eg. Tense, upright, irritable, fearful, difficulty in concentrating/ relaxing) you have been feeling during the past week?

Not at all **Extremely anxious**

0 1 2 3 4 5 6 7 8 9 10

6. How much you have been able to control (ie. Reduce/help) your pain/complaint on your own during the

past week:

I can reduce it **I cant reduce it at all**

0 1 2 3 4 5 6 7 8 9 10

7. Please indicate how depressed (eg. Down-in-the-dumps, sad, downheart, in low spirits, pessimistic,

feelings of hopelessness) you have been feeling in the past week?

Not depressed at all **Extremely depressed**

0 1 2 3 4 5 6 7 8 9 10

8. On a scale of 0 to 10, how certain are you that you will be doing normal activities or working in six months?

Very certain **Not certain at all**

0 1 2 3 4 5 6 7 8 9 10

9. I can do light work for an hour?

Completely agree **Completely disagree**

0 1 2 3 4 5 6 7 8 9 10

10. I can sleep at night

Completely agree **Completely disagree**

0 1 2 3 4 5 6 7 8 9 10

11. An increase in pain is an indication that I should stop what I am doing until the pain decreases

Completely disagree **Completely agree**

0 1 2 3 4 5 6 7 8 9 10

12. Physical activity makes my pain worse?

Completely disagree **Completely agree**

0 1 2 3 4 5 6 7 8 9 10

13. I should not do my normal activities including work with my present pain

Completely disagree **Completely agree**

0 1 2 3 4 5 6 7 8 9 10

Scoring & Risk:

Low risk of chronic disability- under 55 points

Moderate risk of chronic disability- 55 to 65 points

High risk of chronic painand disability- over 65 points

Ifomu lezinkomba ezengeza amathuba okukhubazeka kwentamo isikhathi eside.

Igama: Isigulo:

1. Sicela ukhombise/umake izinga lobuhlungu obuzwile kuleli sonto eledlule

Akukho buhlungu									**Ubuhlungu obukhulu**
0	1	2	3	4	5	6	7	8	9	10

2. Ingabe ubuhlungu, ukuba ndikindiki, ukuluma/ukukitaza noma ukuphelelwa amandla kuyadlulela engalweni yakho (kusuka entanyweni)?

Akukho nakanye									**Ngaso sonke isikhathi**
0	1	2	3	4	5	6	7	8	9	10

3. Ungalilinganisela kuphi izinga lakho jikelele lezempilo? (10x)

Liyabheda									**Lihle kakhulu**
0	1	2	3	4	5	6	7	8	9	10

4. Uma ungaphila impilo yakho yonke nalesi sigulo onaso manje. Ungaphatheka kanjani/ungazizwa kanjan ngalokho?

Ngijabulile									**Ngesaba**
0	1	2	3	4	5	6	7	8	9	10

5. Ingabe uzizwe ukhathazeke (unenhliziyo encane/ucikeka, wesaba, unobunzima bokucabangisisa/ukukhululeka) kangakani kuleli sonto eledlule?

Akukho nakanye **Ukukhathazeka okukhulu**

0 1 2 3 4 5 6 7 8 9 10

6. Ingabe usuzame kangakanani ukulawula (ukudambisa/ukwehlisa) izinhlungu noma isigulo sakho ngokw kuleli sonto eledlule:

Ngiyakwazi ukuzidambisa **Angikwazi ukukudambisa**

0 1 2 3 4 5 6 7 8 9 10

7. Uyacelwa ukuthi ucacise izinga lakho lokuzizwa uphansi noma udangele (phansi kakhulu, udangele, uz nje umoya ophansi, ungenathemba, umuzwa wokungabi nathemba) kuleli sonto elidlule?

Angidangele kwakona **Ngidangele kakhulu**

10

0 1 2 3 4 5 6 7 8 9

8. Uma ungalinganisa ngesikali esibala kusuka kokunye kuye kwishumi, unaso isiqiniseko sokuthi uzobe usukwazi ukwenza imisebenzi evamile/ yemihla ngemihla noma ukusebenza emsebenzini oqashelwe wor ezinyangeni eziyisithupha ezizayo?

Nginesiqiniseko kakhulu **Anginasiqiniseko**

0 1 2 3 4 5 6 7 8 9 10

9. Ngiyakwazi ukwenza imisebenzi elula/engakhandlani isikhathi esingange hora?

Ngiyavuma ngokuphelele **Angivumi kwakona**

0 1 2 3 4 5 6 7 8 9 10

10. Ngiyakwazi ukulala ebusuku

Ngiyavuma ngokuphelele **Angivumi kwakona**

0 1 2 3 4 5 6 7 8 9 10

11. Ukunyukela kwezinhlungu kuwuphawu lokuthi kumele ngiyeke engikwenzayo kuze kudambe izinhlungu.

Angivumi kwakona **Ngiyavuma ngokuphelele**

0 1 2 3 4 5 6 7 8 9 10

12. Umsebenzi ovivinya umzimba wami wenza izinhlungu zenyukele?

Angivumi kwakona **Ngiyavuma ngokuphelele**

0 1 2 3 4 5 6 7 8 9 10

13. Akumele ngenze umsebenzi wami njengenjwayelo, ngisho nomsebenzi wami engaqashelwa wona njengoba nginalezi zinhlungu.

Angivumi kwakona									**Ngiyavuma ngokuphelele**
0	1	2	3	4	5	6	7	8	9	10

<u>Umphumela kanye nengozi:</u>

Izinga eliyingozi eliphansi lokuba semathubeni obuhlungu nokukhubazeka kwafuthi- ngaphansi kwamaphoyinti angama-55

Izinga elingeqile/ eliphezudlwana lokuba semathubeni obuhlungu nokukhubazeka kwafuthi- amaphoyinti angama-55 kuya kuma-65

Izinga eliphezulu lokuba semathubeni obuhlungu nokukhubazeka kwafuthi- ngaphezu kwamaphoyinti angama- 65